


# Clinical management of Aboriginal people with co-existing diabetes and alcohol related health problems – A review



## Final Report

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- Dr Tony Chadderton, Specialist Medical Officer, Drug and Alcohol Services Council of South Australia.

## South Australian health services contacted

The research team contacted the following services for information on current comorbidity management protocols. We acknowledge with sincere gratitude those services that responded, either by phone, or in writing to our request for information.

1. Commonwealth Office of Aboriginal and Torres Strait Islander Health— SA office
2. Department of Human Services (Aboriginal Services Division in SA) (DHS ASD)
3. Aboriginal Health Council of South Australia Inc (Adelaide) (AHC)
4. Aboriginal and Torres Strait Islander Commission (ATSIC)
5. Aboriginal Medical Services (Adelaide–Metropolitan)
6. Australasian Podiatry Council
7. Aboriginal Drug and Alcohol Services of SA (Adelaide–Metropolitan)
8. Central Australia Rural Practitioners Association
9. Northern Metropolitan Community Health Service (Adelaide–Metropolitan Northern region)
10. Parks Community Health Centre (Adelaide–Metropolitan Northern region)
11. Enfield Community Health Centre (Adelaide–Metropolitan Northern region)
12. Lyell McEwin Hospital (Adelaide–Metropolitan Northern region)
13. Modbury Hospital (Adelaide–Metropolitan Northern region)
14. Noarlunga Health Service (Adelaide–Metropolitan Southern region)
15. Inner Southern Community Health Service (Adelaide–Metropolitan Southern region)
16. Southern Women’s Health and Community Centre (Adelaide–Metropolitan Southern region)
17. Karpa Ngarrattendi Aboriginal Health Unit Flinders Medical Centre (Adelaide –Metropolitan Southern region)

18. Repatriation General Hospital Centre (Adelaide–Metropolitan Southern region)
19. Nunkunwarrin Yunti Inc of SA (Adelaide–Metropolitan Central region)
20. Adelaide Central Community Health Service (Adelaide–Metropolitan Central region)
21. Pt Adelaide Community Health Centre (Adelaide–Metropolitan Northern region)
22. Queen Elizabeth Hospital (Adelaide–Metropolitan Central region)
23. Royal Adelaide Hospital (Adelaide–Metropolitan Central region)
24. Women’s and Children’s Hospital (Adelaide–Metropolitan Central region)
25. Maitland Hospital (Maitland–Wakefield)
26. Pt Pearce Health Service Corporation (Maitland–Wakefield)
27. Goreta Aboriginal Corporation (Maitland–Wakefield)
28. Wakefield Regional Health Service (Clare–Wakefield)
29. Pt Pirie Hospital (Pt Pirie–Mid North)
30. South Coast Hospital (Victor Harbour–Hills Mallee Southern)
31. Meningie Hospital (Meningie–Hills Mallee Southern)
32. Raukkan Community (Meningie–Hills Mallee Southern)
33. Murray Bridge Hospital (Murray Bridge–Hills Mallee Southern)
34. Kalparrin Inc. (Murray Bridge–Hills Mallee Southern)
35. Barmera Community Health Centre (Barmera–Riverland)
36. Riverland Health Service (Berri–Riverland)
37. Mt Gambier Hospital (Mt Gambier–South East)
38. Ceduna/Koonibba Health Service (Ceduna–Eyre)
39. Oak Valley (Maralinga) Inc. (Ceduna–Eyre)
40. Yalata Health Service (Ceduna–Eyre)
41. Tullawon Health Service (Ceduna–Eyre)
42. Pt Lincoln Aboriginal Health Service (Pt Lincoln–Eyre)
43. Pt Lincoln Hospital (Pt Lincoln–Eyre)
44. Whyalla Community Health Centre (Whyalla–North & Far Western)
45. Pt Augusta Hospital (Pt Augusta–North & Far Western)
46. Pika Wiya Health Service (Pt Augusta–North & Far Western)
47. Umoona Tjutagku Health Service (Coober Pedy–North & Far Western)
48. Oodnadatta Health Service (Oodnadatta–North & Far Western)
49. Dunjiba Community Council (Oodnadatta–North & Far Western)
50. Anangu–Pitjanjatjara Lands/Nagampa Health (Umuwa, Amata, Ernabella, Indulkana, Kenmore Park, Mimili, Nyapari, Watarru & Fregon Communities (North & Far Western))
51. Copley, Leigh Creek and Nepabunna Community (Northern remote communities)

# Abbreviations

BGL	Blood Glucose Level
BMI	Body Mass Index
BP	Blood Pressure
ECG	Electro Cardio Graph
OGTT	Oral Glucose Tolerance Test
MCV	Mean Corpuscular Volume
HDL	High Density Lipoprotien
Hypo	Hypoglycaemic episode

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# Executive summary

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## **Project aims**

This project aimed to review the extant literature and identify evidence of clinical pathways, protocols and procedures being used by health professionals and Aboriginal health workers in the assessment and management of comorbid alcohol related disease and diabetes in Aboriginal people<sup>1</sup>. Comorbid diagnoses present serious health needs for Aboriginal<sup>2</sup> people and especially those with diabetes. This report summarises the relevant desktop and published literature to make recommendations for future action regarding improved management and enhanced outcomes of this client group.

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## **Project method**

A small team from the School of Nursing and Midwifery at Flinders University in South Australia undertook the project after receiving funding from the Flinders University Institute of Health Research. After appropriate ethical approval was received a purposive sample of 47 non-Aboriginal and Aboriginal health services throughout South Australia were invited to provide information on diabetes and alcohol related disease comorbidity. Five documents were provided and 11 other organisations were interviewed regarding their management via phone follow-up. All responses were noted and reviewed for specific themes, issues and concepts to inform the project aims. These findings were added to an extensive review of the published literature that could inform management of clients with comorbid diabetes and alcohol related diseases.

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## **Project background**

The health status of Aboriginal Australians continues to be poor with life expectancy at birth of Indigenous Australians estimated to be around 20–25 years lower than the total population<sup>2</sup>. Premature death and high morbidity significantly impact on communities, where individuals and families experience continual loss. Endocrine disorders have the highest overall standard of mortality ratio among Aboriginal people who are dying at three times the rate of the rest of the population<sup>3</sup>. There is a 10 to 30 per cent higher incidence of diabetes among Aboriginal people than is found in all other Australian sub populations<sup>4,5</sup>. As one participant in our study noted *'Some Aboriginal people have been sick for so much of their lives they accept feeling bad as normal, so they don't even discuss their diseases because they accept them as a fact of life'*.

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## ***The facts about diabetes***

Diabetes is a growing health concern worldwide and in Australia, with estimates of 700 000 Australians with diabetes in 1995 growing to 950 000 by 2010<sup>6,7</sup>. The National Health Survey estimates that 6.2 per cent of Australian males over 45 and 5.3 per cent of females over 45 have Diabetes<sup>8,9</sup>. Aboriginal Australians have the fourth highest rate of Type 1 diabetes in the world<sup>8,10</sup>. Studies indicate a higher prevalence of risk factors for Type 2 diabetes and cardiovascular disease in Aboriginal adolescents and children<sup>11</sup>. Mortality in Australians with diabetes is approximately twice that of Australians that do not have diabetes and this is higher among Aboriginal Australians. When people with diabetes have comorbid alcohol related diseases, mortality rates grow exponentially.

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## ***Understanding alcohol related disease***

The use of alcohol is an accepted part of mainstream Australian society. However, alcohol was implicated in the deaths of 3 271 people and the hospital episodes of a further 43 000 in 1998<sup>12</sup>. Data from the National Drug Strategy Household Survey 2001, stated over 80 per cent of Australia's population consumed alcohol in the previous 12 months, and between 8.3 per cent and 10.2 per cent of the population drink daily<sup>12-14</sup>. The National Mental Health Strategy notes the alarming comorbidity of mental health issues and alcohol misuse<sup>15</sup>.

Many acute and chronic health problems are initiated or exacerbated by heavy alcohol intake. Excess alcohol has been linked to the increase in renal disease in Aboriginal people<sup>16</sup> and the complication of injuries and infections such as pneumonia<sup>17,18</sup>. Other health problems provoked by heavy alcohol use include: neuropathy, hypertension, liver disease (cirrhosis), some cancers (throat, mouth, oesophagus), gastritis, peptic ulcers, pancreatitis, pregnancy (foetal growth retardation), cardiovascular diseases (e.g. cardiomyopathy), haemorrhagic stroke, heart failure and cognitive function leading eventually to dementia<sup>19,20</sup>. Consequently, having comorbid diabetes and alcohol related disease places a person at a greatly increased risk of debilitating morbidity and mortality.

Stereotypes abound regarding alcohol use among Aboriginal Australians, but research demonstrates Aboriginal people are less likely to drink than non-Aboriginal Australians. However, when they do drink they are more likely to drink at high or very high risk levels undertaking more harmful binge drinking<sup>21-24</sup>. The Aboriginal community is concerned about the impact excessive alcohol and/or other drug use has on the morbidity and mortality of their people, even though the proportional percentage of Aboriginal people falling into this category is less than in the non Aboriginal community<sup>21,25-27</sup>.

Successful intervention programs aimed at reducing alcohol use in rural and remote communities among Aboriginal people have in common local community participation in the planning, implementing and evaluating processes, ensuring culturally appropriate programs, grounded in the local traditions, beliefs and practices of the people they are designed to serve.

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## ***Assessment of clients with diabetes and comorbid alcohol related disease***

The National Diabetes Strategy 2000–2004<sup>28</sup> agreed to focus attention on Aboriginal people with diabetes and recommended health workers practise opportunistic assessment<sup>29</sup> for diabetes as a preferred standard of health care practice. This is more acceptable to Aboriginal people, because bloods can be taken in the field, providing accurate measures so management plans can be affected rapidly, with minimal disturbance to clients. Regarding alcohol intake, all people should be asked, ‘Do you drink alcohol, including beer, wine, or spirits?’ If the person responds ‘No’, the health worker should ask the follow-up question, ‘What made you decide not to drink?’ If the person is a lifelong abstainer or has been in recovery for more than five years, the screening process is complete. If the person answers ‘yes’ the AUDIT instrument is a ‘best practice standard’ assessment tool in Australia. It is considered to be reliable and culturally transferable. It has been administered to Aboriginal people by interview when their literacy and comprehension skill are inadequate<sup>30</sup>. Some Indigenous health workers have problems with the questions relating to guilt and remorse about drinking in the AUDIT tool, and instead choose to use carefully worded questions around binge drinking and average daily consumption<sup>31</sup>. If considered necessary blood should be taken to check for elevated levels of the liver enzyme—GGT as this is the most sensitive test of early liver dysfunction and alcohol intake<sup>32</sup>.

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## ***Strategies for management client with comorbidity***

Many informants in this project noted that they had asked for chronic disease management strategies rather than individual strategies for diabetes care, because many clients had comorbid kidney disease, heart disease, asthma, mental illness and alcohol related disease, but these requests have not been acted upon<sup>33</sup>. Most informants recognised the importance of one management plan to care for the ‘whole’ person. However, fragmented management is true for all clients with comorbidities who have to engage with a health care system structured around specialised and compartmentalised care.

It is imperative that Type 2 diabetes is well managed if complications are to be prevented and reduced<sup>34</sup>. The metabolic nature of the disease means it affects all body systems and people with Type 2 diabetes are increased hospital users for treatment of infections, amputations, kidney dialysis and transplants, laser therapy for retinopathy, and other specialist care. Premature death is the most serious result of diabetes, usually caused by one or more of the associated complications. The management of diet is critical to good glycaemic control. The diet aims to restrict refined carbohydrate intake and increase carbohydrates high in natural fibre, by consuming low glycaemic index food<sup>35</sup>. Those requiring weight loss to improve insulin resistance should reduce saturated fat intake to less than 10 per cent of their energy intake<sup>36</sup>.

The client with comorbid alcohol related diseases should not have sulphonylureas as first line therapy for diabetes, as they will be at increased risk of hypoglycaemic complications<sup>18</sup>. Instead the preferred approach is through the use of Metformin or Insulin. However, clients with a history of binge drinking (five or more standard drinks in a session) and abnormal liver function tests, should not be given Metformin, because it increases the risk of lactic acidosis<sup>37</sup>.

## ***Strategies Aboriginal health workers may use with the client who has diabetes and drinks alcohol***

People with diabetes need to develop action plans if they are going to drink. While it is recognised that once diabetes is established, alcohol is a complicating factor in glycaemic control, some people with diabetes still choose to continue drinking. The NH&MRC (2001) advises that a standard drinks is 10grams of pure alcohol. It will be helpful for clients to have a basic understanding of these three questions before devising an action plan. What is a fast and slow acting carbohydrate? How does the liver work? What is a standard drink? The strategies gleaned from current literature say the AHW might discuss the following points with the person who has diabetes and who chooses to continue drinking alcohol and then develop a workable strategy using this information as the starting point:

**Table 1 A brief summary of advice to your client with diabetes who drinks alcohol**

<b>Please be aware that:</b>
<ul style="list-style-type: none"> <li>• if you have Type 1 diabetes it is best not to drink alcohol;</li> </ul>
<ul style="list-style-type: none"> <li>• if you have established Type 2 diabetes it is best not to drink alcohol;</li> </ul>
<ul style="list-style-type: none"> <li>• if you choose to drink it is best to stop at one to two standard drinks because alcohol complicates diabetes;</li> </ul>
<ul style="list-style-type: none"> <li>• continuing to drink puts you at high risk of complications; and each alcoholic drink is carbohydrate and counts toward calorie intake.</li> </ul>
<b>If you have diabetes and choose to drink you can reduce harm if you:</b>
<ul style="list-style-type: none"> <li>• stop at two standard drinks per day with at least two alcohol free days each week;</li> </ul>
<ul style="list-style-type: none"> <li>• eat a carbohydrate meal or snack before and during drinking;</li> </ul>
<ul style="list-style-type: none"> <li>• try not to exercise while you drink;</li> </ul>
<ul style="list-style-type: none"> <li>• try to choose drinks that are low alcohol, low joule or diet drinks;</li> </ul>
<ul style="list-style-type: none"> <li>• try not to binge drink, as this is really risky for people with diabetes;</li> </ul>
<ul style="list-style-type: none"> <li>• remember getting ‘drunk’ masks the signs of low blood sugar (‘hypo’);</li> </ul>
<ul style="list-style-type: none"> <li>• ‘Hypos’ (hypoglycaemia) are promoted by drinking alcohol;</li> </ul>
<ul style="list-style-type: none"> <li>• you should monitor your blood glucose level while drinking and for 24 hours after;</li> </ul>
<ul style="list-style-type: none"> <li>• take your prescribed medications and keep you diabetes medications within reach;</li> </ul>
<ul style="list-style-type: none"> <li>• tell someone with you that you have diabetes and make sure they know what to do if you need help; and</li> </ul>
<ul style="list-style-type: none"> <li>• wear a medic alert stating you have diabetes.</li> </ul>

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## **Learning needs of Aboriginal health workers regarding comorbidity management**

AHWs and other health professionals need to know what alcohol does that impacts on diabetes. For example, they should know alcohol is a psychoactive depressant that slows the brain and central nervous system, so it affects concentration, coordination and response time. Alcohol absorbs rapidly in the bloodstream in small amounts (one to two drinks). When a person drinks alcohol the liver stops metabolising fat to make glucose, so it can metabolise the alcohol from the blood<sup>38</sup>. It takes approximately one hour for a normal healthy adult male to metabolise ten grams of alcohol, but women metabolise alcohol more slowly than men. Women are more susceptible to the effects of alcohol because they have an increased bioavailability of alcohol due to decreased gastric alcohol dehydrogenase activity and first pass metabolism<sup>39</sup>. These metabolic processes lower the blood glucose level, which increase the risk for persons, especially when they drink on an empty stomach or shortly after taking insulin.

Alcohol has a vasodilatory effect, but more than two drinks (>30–60gm) have a vasoconstricting effect, therefore blood pressure rises as alcohol intake increases<sup>20</sup>. For that reason binge drinking may result in acute blood pressure elevation and increased risk of stroke<sup>40</sup>. Additionally, it may interfere with antihypertensive medication<sup>36</sup>. Alcohol intake elevates triglycerides levels, increases lipoprotein synthesis and inhibits fatty acid synthesis in the liver which combine to increase cardiac risk factors<sup>36</sup>. If the client taking sulfonylureas (insulin release stimulating drugs) fasts from food, the blood glucose level plummets when alcohol is ingested<sup>41</sup>. All of which appear to counter any argument for ‘controlled drinking’ and favours abstinence as the preferred action for optimising diabetes management.

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## **Project recommendations**

No one model of management will work across the entire Aboriginal population as the lifestyle of urban Aboriginal people differs to those living in remote areas. Diabetes is not necessarily considered a health issue in many people’s lives until it reaches a crisis point<sup>33</sup> and coherent case management takes time to implement, so early referral to appropriate Aboriginal and other health professionals is essential.

AHWs want partnership approaches that facilitate participation and accountability for their communities, and the professionals in the health system, thus enhancing the scope and reach of their services. AHWs with expertise in diabetes management acquire up-to-date knowledge that must be utilised in that area of work<sup>42</sup>. The *Future Pathways*<sup>43</sup> report identified recommendations for improving the training and development of the Aboriginal health workforce and many of these recommendations have been put in place in a specialised diabetes courses conducted by King<sup>44–47</sup>. However few AHWs have had basic or specialist training in the assessment and management of alcohol and other drugs, yet the prevalence and impact of alcohol on comorbidities is of critical importance to quality management and this situation needs to be rectified urgently. Further to that point, this study identified the need to coordinate the areas of diabetes, mental health and substance misuse care, into one comprehensive and flexible management plan.

The 2003–04 Federal Budget set aside \$4.4 million (over two years) to the National Comorbidity Initiative to improve service coordination and treatment outcomes for clients with both illicit drug addiction and mental illness<sup>48</sup>. This study found diabetes impacts on a large portion of the Indigenous community and its management is of such critical importance, as some clients are known to be discontinuing insulin

therapy to accommodate drinking episodes. Thus we recommend direct resourcing of management plans that address multiple comorbidities in Indigenous client groups. Such a measure could improve coordination and build capacity across psychiatric/mental health services, general medical services, drug treatment services, and Aboriginal health services and has the possibility of developing best practice guidelines that facilitate service delivery, and increase well informed professional education and training for Aboriginal health workers, and mainstream health professionals.

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### ***Project recommendations re the Aboriginal health worker curriculum***

AHWs who were informants in this project expressed concern over their role and scope of practice regarding diabetes management, verifying earlier research<sup>49</sup>. It is imperative people employing AHWs, clearly identify and support their role and scope of practice. A 'one size fits all' curriculum does not work for all Aboriginal health workers as they come from diverse rural, remote and urban communities. Several recommendations are expanded in this report. They include:

- Improved understanding of particular at-risk client groups such as those with comorbidities.
- Developing cultural understanding amongst all health professionals working with Indigenous clients.
- Promoting a community development/community health focus to health care management.
- Instructing methods of spreading the prevention and health promotion message within diverse communities.
- Specific course content regarding alcohol and drug use, e.g. understanding the concept of a 'standard' drink<sup>50</sup>; various approaches to alcohol management; accurate alcohol assessment<sup>51</sup>; developing integrated/comprehensive care plans; managing comorbid health needs; the impact of disadvantage on alcohol dependence, and the effect of low autonomy on diabetes risk factors<sup>52, 53</sup>.
- Education and support concerning holistic diabetes management e.g. nutrition; link between diabetes and lifestyle; impact of diabetes on families; understanding of medication management; social factors and positive role modelling regarding disease management and social development<sup>54</sup>; training in basic podiatry; diabetes education etc.

## ***Project recommendations for service providers***

- Development of protocols that take into account the presence of comorbid diabetes and alcohol related disease.
- Provision of adequate access to appropriately educated service providers.
- AHWs having access to education and continuing updates in the specific areas of clinical need of their client group.
- Prevention of inappropriate responses of services by reducing multiple referrals, untimely appointments, rushed appointments etc.
- Prevention of communication problems by providing bi-cultural workers and interpreters, and cultural sensitivity training to health professionals.
- Increase ability of health professionals to respond to the particular needs of Aboriginal people and commitment to challenge racism within health care delivery.
- Provision of up-to-date, consistent, quality information for clients and workers across the health continuum regarding diabetes and alcohol related disease prevention and management.
- Ensure reliable access to alcohol assessment and intervention and treatment resources in rural and remote areas.
- Ensure reliable access to diabetes monitoring/assessment supplies in rural remote areas.
- Ensure accurate data-sets on prevalence of health problems to facilitate forward planning.

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## ***Conclusion***

The quality management of diabetes is critical to improving the morbidity and mortality rates of Aboriginal people. When people with diabetes engage in harmful drinking their health outcomes are further diminished and their lives are placed at great risk. Aboriginal health workers and other health professionals are frequently expected to help clients with comorbid alcohol related disease and diabetes to make decisions about their self-management. They do this in a vacuum of approved evidence based, culturally sensitive education and protocols that can be implemented and accepted by their Indigenous clients. This report provides Aboriginal health workers and other health professionals with a basis for discussion and understanding of this topic, and more particularly, with clients, who may choose to drink when they have diabetes.

# Introduction

This project aimed to identify through the literature and from key informants the existence of any clinical pathways, protocols and procedures that can be used by health professionals and Aboriginal Health Workers in South Australia in the management of comorbid alcohol related disease and diabetes in Aboriginal people. Comorbidity is simply defined as ‘the co-occurrence of one or more diseases in an individual’<sup>1</sup>. Kowanko, de Crespigny and Murray<sup>55</sup> (2003) note that comorbidity is a serious health problem for Aboriginal people and especially those with diabetes. Consequently, the research team sought to locate clinical pathways and protocols used to manage the comorbidity of alcohol related disease and diabetes, and which were deemed successful by those using them. The relevant desktop and published literature was searched and additionally, all health services in South Australia with a known Aboriginal client focus were invited to share their pertinent information. The following report is a summary of what was found and recommendations for future development are included.

The project originated after Aboriginal Health Workers (AHWs) undertaking a post graduate course in diabetes management and education at Flinders University reported that some of their clients with diabetes and who had drinking problems, were prescribed insulin therapy to manage this condition. To avoid the hypoglycaemia associated with alcohol consumption and insulin therapy, this group of clients discontinued their insulin to accommodate their drinking episode<sup>42</sup>. Many rural and remote AHWs’ clients are reluctant to visit multiple different professionals for their various physical conditions, especially if this involves travelling outside the community in which they live. Consequently, the management of these clients falls on the AHWs’, who do not have accessible protocols to manage these clients with complex comorbidity related health issues.

## Aims and objectives

This project was funded by a small grant from the Flinders University Institute of Health Research, and explored the published and desk top literature to locate relevant materials relating to the optimal clinical management of comorbid diabetes and alcohol related diseases in Aboriginal people. The aim was to meet a need stated by AHWs across South Australia for accurate, coordinated processes that produced quality outcomes for this large client group. Therefore information on any current protocols and clinical pathway data were sought from health service providers that served Aboriginal clients with diabetes and/or alcohol related disease across South Australia. To understand the issues involved, the published literature was searched to provide a context to the problem, an understanding of what were the current processes in each of the disease areas, and how these were being implemented. The search was focused on materials relevant to the Aboriginal client group, and the latest evidence based clinical management pathways available for use for both disease areas and their comorbid management. Discussion and recommendations focus on ways service providers and AHWs learning needs may be met so that AHWs and other health professionals are better prepared to manage this needy client group.

## Research method

A small team from the School of Nursing and Midwifery at Flinders University undertook the project. Ethical approval was gained from the Aboriginal Health Council of South Australia and the Social and Behavioural Ethics Committee of Flinders University, and Yunggoorendi First Nations Centre for Higher Education Research at Flinders University. The project used document analysis and key informant interviews, and in keeping with NH&MRC guidelines for undertaking research in Indigenous communities, data were collected from informants in a non-invasive and culturally acceptable manner<sup>56</sup>. The research group believes that if recommendations are implemented they can return benefits to the Indigenous community.

Forty-seven health services across South Australia<sup>3</sup> were invited (by letter) to supply the research team with any relevant documented information regarding protocols or clinical pathways they used or had developed for managing diabetes, alcohol related disease and/or their comorbid presentation. Data were requested from this purposive sample of non-Aboriginal and Aboriginal services in South Australia. In several places the Aboriginal health worker and/or diabetes health worker were the same person across more than one organisation.

Of the 47 individuals and organisations approached, five provided documents for analysis. Of the documents supplied none were protocols. After phone follow-up of the remaining health services it became clear that there were no formal or specific documents pertaining to comorbidity management of alcohol related disease and diabetes. Most participants referred their clients to professionals who had specific knowledge in either disease area. Consequently the participants (Aboriginal health workers and health professionals) were followed up by phone to discuss what actions they were finding successful, and what difficulties they were encountering. A brief schedule of ten questions was used to guide the phone interview. A further 11 organisations responded to these interviews and responses were noted and reviewed for specific themes, issues and concepts that might inform the project outcomes.

The ten interview questions asked were:

1. What protocols are you using to educate/manage your clients with diabetes regarding:
  - assessment and screening for complications,
  - dietary control,
  - managing complications, e.g. hypoglycaemia,
  - blood glucose level monitoring,
  - lifestyle factors (exercise, alcohol use, smoking, weight loss, nutrition, foot care ...)
2. What is working effectively with your clients? Why?
3. What barriers are there to effective implementation of current protocols? Why?
4. How do you think diabetes management can be promoted in your community?

5. What protocols are you using to educate/manage your clients who use alcohol regarding:
  - assessment and screening for disease,
  - levels of harmful drinking,
  - impinging factors (cultural and social such as family, violence ...)
6. What is working effectively with your clients? Why?
7. What barriers are there to effective implementation of current protocols? Why?
8. How do you think alcohol management can be promoted in your community?
9. What joint management protocols do you use when your client with diabetes has comorbid alcohol related diseases?
10. What should be done to improve the education and management of clients with comorbid diabetes and alcohol related disease?

# The health of Aboriginal and Torres Strait Islander Australians

The health status of Aboriginal<sup>4</sup> Australians continues to be poor. The mortality rates are higher for Aboriginals and this premature death has a huge impact on community life, where families must reconfigure continually after experiencing losses<sup>17</sup>.

According to the joint report of the Australian Bureau of Statistics (ABS) and Australian Institute of Health and Welfare (AIHW), the life expectancy at birth of Indigenous Australians is estimated to be 20 years lower than the total population<sup>2</sup>. The median age of the Aboriginal population is 20 years compared with 36 years for all other Australians<sup>3</sup>.

The median age for death of Aboriginal people is 52 years and for all others is 77 years, thus presenting a gap of 26 years in life expectancy between Indigenous and non-Indigenous Australians<sup>57</sup>. Using the overall standard of mortality ratio (SMR) Aboriginal people are shown to be dying at three times the rate of the rest of the population, with endocrine disorders being the group with the highest SMR for both males and females<sup>3</sup>. As one informant in our study noted *'Some Aboriginal people have been sick for so much of their lives they accept feeling bad as normal, so they don't even discuss their diseases because they accept them as a fact of life'*.

There are a multiplicity of factors that account for poor Aboriginal health, but many believe their deprived health status is due to a complex blend of issues that include substantial social and economic disadvantage, cultural dislocation, discrimination and political oppression<sup>58–61</sup>. For some communities the poor availability of a reliable supply of healthy and appropriate food is a militating health issue, as are inadequate living conditions, poverty, inadequate literacy, unemployment and an array of cultural and lifestyle issues<sup>33</sup>. Additionally, a culture of mistrust rooted in a history of oppression, institutional racism and social disadvantage pervades communities, with up to 46 per cent of Aboriginal people (compared to 28 per cent in the non-Aboriginal population) believing people in positions of power do not act in their interests<sup>62</sup>. The greatest mistrust is reserved for government officials and professionals with whom Aboriginal people must deal to access the basic requirements they need for their safety, survival, health and wellbeing.

In South Australia the hospital admission rates for Aboriginal people are higher for most conditions especially mental health disorders, poisons and injuries, diseases of the circulatory system, pregnancy and child birth complications and diabetes<sup>63</sup>. In fact in many Aboriginal communities it is not a case of dual diagnoses, but multiple comorbidities being the norm for many Aboriginal clients with 1–25 diagnoses being reported, and four concurrent diagnoses being the median<sup>55</sup>. That study notes 25.3 per cent of all Aboriginal people reported in the South Australian hospital separation data between 1995–2000 had a comorbidity of endocrine and metabolic disorders, which underscores the importance of management plans that take into account the complex interplay of comorbidities<sup>55</sup>.

Wanders and Wilson point out that diabetes was nominated as one of the top five health issues in every Aboriginal community in South Australia, with harmful alcohol consumption also featuring as a great concern<sup>33</sup>. When working with Aboriginal people it is important to remember medical treatment does not equal health care. Consequently, all health workers need to build trust among members of their communities, so that the people can feel encouraged and motivated to keep themselves well, as opposed to just treatment at times of crisis. This includes

addressing health issues such as smoking, drinking, inadequate nutrition, as well as having access to good housing, clean water, nutritious food, appropriate garbage and sewerage disposal, education and employment opportunities, and cultural and spiritual well-being.

In some communities interpersonal violence and social dislocation militate against health. About 13 per cent of Aboriginal people say they feel threatened by household members, stating there is a lot of anger present within their family and between household members<sup>22</sup>. This is possibly due to a growing mental health component to illness, increased drug and alcohol use, social issues such as poverty, unemployment and displacement, all of which exacerbate illness. In 1998 the Department of Health and Human Services in Tasmania found 24 per cent of Aboriginal informants had experienced depression and 8 per cent had contemplated suicide. The recent study by Kowanko and de Crespigny (2003 p.109) indicates 8 663 Aboriginal people present in the South Australian hospital separation data between 1995 and 2000 (population of 20 435 Aboriginal people in South Australia) had a diagnosis of a mental disorder<sup>55</sup>. Of this group 79 per cent were using/misusing alcohol and other drugs. Such figures received anecdotal agreement from participants contacted in this project and again underscore the need for health plans that take comorbidities into account when devising care management strategies.

Aboriginal people are more likely to rate themselves at the lower end of health and wellbeing spectrum indicators, being well aware of their low health status. Addressing this requires the development and implementation of policy and strategies that promote positive community living, communal and economic wellbeing, and consider the prime importance of 'the person and their country' when undertaking health care plans with Aboriginal Australians. Their wellness is developed through relationships of mutual care and this needs to be included in the plan of care<sup>64</sup>. This is often termed a 'whole-of-life' approach by the AHWs<sup>33</sup>. Aboriginal health workers consult the community regarding decision making about how their people should be treated, and any perceived needs for systemic change<sup>65</sup>. Thus the success of any management plan relies on all health workers and policy developers understanding this fact, respecting it, and working to ensure that decision making is centred in the community from which a response is desired.

# Understanding the situation with diabetes in Australia

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## ***Diabetes—The characteristics***

The World Health Organisation (WHO) defines diabetes mellitus as ‘a metabolic disorder of multiple aetiology characterised by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both<sup>66</sup>. Put simply, people with diabetes do not produce enough of the hormone insulin. This hormone allows glucose, the energy source of body cells, to move from the blood into the cell. If there is not enough insulin available to undertake this process the glucose level in the blood rises.

There are three types of Diabetes Mellitus. They are: Type 1 diabetes or Insulin-Dependent Diabetes Mellitus (IDDM); Type 2 diabetes or Non Insulin-Dependent Diabetes Mellitus (NIDDM); and gestational diabetes mellitus (GDM)<sup>66, 67</sup>.

*Type 1 diabetes*—is predominantly a childhood disease and is more common in developed countries<sup>68</sup>. Management usually requires injection of insulin into the body, because the pancreas does not produce sufficient insulin for cellular function. Onset of Type 1 diabetes is rapid and the person has symptoms such as increased thirst and hunger, frequent urination, weight loss and feelings of overwhelming tiredness. Diabetes may also be diagnosed by the health professional with an assessment of symptoms such as frequent infections, boils, urinary tract infection and thrush. People may have one or more symptoms, but symptoms alone are insufficient. To clinch a diagnosis of diabetes the client must have blood glucose tests undertaken to provide an accurate diagnosis<sup>69</sup>.

*Type 2 diabetes*—on the other-hand usually starts in later adulthood in people over 40 years of age, however it often presents at a much younger age in Aboriginal people. This type of diabetes is not usually due to insulin shortage, so it can often be managed through diet and exercise to improve insulin secretion and decrease cellular resistance to insulin<sup>70</sup>. People who are overweight store their sugar as fat and this leads to insulin-resistance and the reduced function of deteriorating beta cells, which is a key sign that the disease has progressed from insulin resistance to clinical diabetes. If the beta cells remain in an exhausted state the person will need insulin injections<sup>71</sup>. Complications are more common in individuals with Type 2 diabetes due to the long period of disease prior to diagnosis.

*Gestational diabetes mellitus (GDM)*—occurs during pregnancy and this is usually a temporary intolerance to carbohydrate, which returns to normal after birth, thus diabetic women who are pregnant are not included in this category. Diagnosis and management are necessary to minimise the risk of birth defects and future diabetes in the baby, who is more likely to develop impaired glucose tolerance and/or diabetes in later life<sup>10</sup>. Researchers say mothers with GDM are 40 per cent more likely to develop diabetes in the following 10 years after the birth<sup>5</sup>, so education to get follow-up testing is important.

## Diabetes—The Australian prevalence

The prevalence of *Diabetes Mellitus* is an escalating national and international health problem. It is estimated that by 2010 the total number of individuals with diabetes will have doubled since 1994, with an estimated 23.7 million people having Type 1 diabetes and 215.6 million having Type 2 diabetes<sup>10, 68</sup>. Australian estimates calculate the rise to be from 700 000 people with diabetes in 1995 (half of whom are unaware they have the condition) to 950 000 by 2010<sup>6, 7</sup>. The National Health Survey estimates that 6.2 per cent of Australian males over 45 and 5.3 per cent of females over 45 have Diabetes<sup>8, 9</sup>. These figures do not take into account estimates of one undiagnosed person for every diagnosed person with diabetes<sup>7</sup>. As many as one in four people in Australia have abnormal glucose metabolism with 50 per cent of undiagnosed people having early complications<sup>9, 66, 72</sup>.

The Health Omnibus survey found the prevalence of diabetes in the general population in South Australia was 5.3 per cent<sup>73</sup>. The annual incidence of diabetes related death is said to be 150 per 100 000 persons (age standardised)<sup>16</sup>. This figure compares to National Aboriginal and Torres Strait Islander Survey of 1994, which estimated 17 per cent males and 23 per cent females in the Aboriginal community have diabetes. Bearing in mind that both surveys used self-reporting as the basis of data, these figures are likely to be higher. Additionally, the onset of diabetes in Aboriginal people occurs at a much lower age than in the non- Aboriginal population<sup>5, 37</sup>.

There is a 10 to 30 per cent higher incidence of diabetes in Aboriginal people than is found among all other Australian sub populations<sup>4, 5</sup>. Aboriginal Australians have the fourth highest rate of Type 1 diabetes in the world<sup>8, 10</sup>. Recent screening in 1999 among Torres Strait Islander people found 22 per cent of that population have diabetes, but that figure is higher amongst older men (36 per cent) and women (58 per cent)<sup>70</sup>. Nationally, Indigenous hospitalisation rates for diabetes were six times those of non-Indigenous people in 1997–98<sup>74</sup>. This increased in 1998/99 to 1 600 hospital separations of Aboriginal people with Type 1 and Type 2 Diabetes nationally in 1998–99, which is ten times the expected rate for males and 15 times for females, based on the total Australian population<sup>8</sup>. In the period 1995–1997 deaths from diabetes were nine times more common than expected, for Indigenous males living in WA, SA and the NT and 16 times more common for Indigenous females<sup>75</sup>.

The Aboriginal and Torres Strait Islander Casemix study<sup>76</sup> highlighted the higher resources required to restore the health of Aboriginal patients with a 39 per cent overall differential cost across the same diagnostic related grouping. This was thought to be due to the severity of presenting disease and complicating comorbidities. Even children presenting for care in Northern Territory have a much higher level of comorbidity than non Aboriginal children, which leads to longer length of stay in hospital and most likely poorer health outcomes<sup>77</sup>. However, in South Australia the Casemix funding carries a loading for hospitalised Aboriginal people with multiple comorbidities<sup>78</sup>. The diagnostic related groups associated with substance abuse (including alcohol) are also higher and this may indicate a need to review the models of service delivery for these clients and how treatment and ongoing health care is provided within their communities.

Other studies indicate a much higher prevalence of risk factors for Type 2 diabetes and cardiovascular disease in Aboriginal adolescents and children<sup>11</sup>. Torres Strait Islanders report diabetes as their main health problem and Aboriginal populations report alcohol abuse as their main problem<sup>16</sup>. When one considers excess alcohol

intake provides high caloric load, which increases obesity and damages the pancreas and liver, both factors that induce diabetes and complicate the proper management of diabetes, a strategy for comorbidity management becomes essential. AHWs consulted in this study reported high incidence of comorbidity for both alcohol-related conditions and diabetes. A nationally organised approach to data collection that takes into account all comorbidities, is imperative for early detection and quality management promotes optimum well-being and that prevents complications<sup>79</sup>.

More accurate statistics will be available in the future as the *National Diabetes Register* that commenced on 1st January 1999 provides epidemiological data. The register indicates whether the registrant is of Aboriginal or Torres Strait Island origin, however, registration is voluntary and only required for people who wish to access the *National Diabetes Service Scheme*. Many people are unaware of the presence of this scheme, and rely on health professionals to inform them, so it is likely the register will still under-report the prevalence of diabetes in Australia. It is important that this data can also be broken down into data that represent cultural groupings. Type 2 diabetes comprises 85–90 per cent of all cases of diabetes thus its management is of concern to public health authorities of most developed countries including Australia<sup>66</sup>. Those who are at additional risk of getting Type 2 diabetes include: women who are post menopausal because they have reduced insulin sensitivity<sup>80</sup>; people on medication (more than 300 are known to interact with alcohol)<sup>80</sup>; and people who drink heavily (> 4 drinks /day)<sup>81–85</sup>.

The BMI specific diabetes incidence rates in Australian Aboriginal people are among the highest in the world, thus an urgent need exists to help them prevent weight gain<sup>52</sup>. The rise in incidence of Type 2 diabetes in developed countries corresponds to an increase in food availability, intake of high carbohydrate, high fat diets, and decreased activity leading to obesity. Aboriginal communities impacted on by poverty and western lifestyles have encountered increased diabetes due to changing diet, lifestyle and poor living conditions<sup>10</sup>. Much research has been undertaken by O'Dea and her team, who postulate that this may in part be due to the presence of a 'thrifty gene' that helps Aboriginal people regulate their metabolism in times of abundance and shortage of food supply<sup>86–100</sup>. The incidence of high risk factors such as obesity, hypercholesterolaemia, and alcohol consumption in Aboriginal communities, and the lower age of onset of these problems lead directly to a higher incidence of cardiovascular and renal disease and subsequent premature death in Aboriginal people<sup>3, 22, 57, 101, 102</sup>.

The major long term complications of diabetes include large vessel disease leading to heart disease, stroke, erectile dysfunction, foot ulceration, gangrene and lower limb amputation, renal failure and visual impairment. Diabetes is the most common cause of blindness in those under 60 years of age, the most common cause of non-traumatic amputation, and the second most common reason people commence renal dialysis<sup>69</sup>. Complications of diabetes are more common among Aboriginal people who have a higher incidence of renal failure and infections relating to diabetes and risk of injury from interpersonal violence after the context of heavy drinking episodes<sup>103</sup>. The prevalence of vision threatening retinopathy is between six and 13 per cent among people with diabetes in the community but it is higher among Aboriginal people in most regions of Australia. The age for presentation with retinopathy is lower amongst Aboriginal people with diabetes, which is probably due to impaired medical management, lack of optimal resources, and late diagnosis of their diabetes, which is estimated to be around six years later<sup>104</sup>. Complications are preventable by modifying risk factors and early diagnosis allows for early intervention using the process of registering, recalling, recording and resourcing clients to manage their disease. It is important all people understand that good glycaemic control and

effective management of high blood pressure reduces the risk of diabetes complications, especially those which impact on the eyes, heart and peripheral circulation<sup>17</sup>.

# Diabetes—Assessment and diagnosis

Based on the information regarding prevalence of diabetes among Aboriginal Australians the National Diabetes Strategy 2000–2004 agreed to focus more attention to this population<sup>28</sup>. They recommended health workers among Aboriginal populations should practise opportunistic assessment for diabetes as a preferred standard of health care practice and health promotion.

This assessment for diabetes should check the client's weight, Body Mass Index (BMI), blood pressure (BP), blood glucose level (BGL) and subsequent glucose screening. They should screen the blood for haemoglobin estimation HbA1c, Vitamin B12, cholesterol and creatinine levels. The urine should be checked for ketones, glucose, protein and the presence of infection, checking specifically for microalbuminuria that might indicate early damage to the glomerular filtration barrier. The presence of proteinuria on the dipstick develops five to 10 years after the onset of microalbuminuria, or at about 10–15 years after the onset of diabetes<sup>10, 68</sup>. If the person has comorbidity of alcohol related disease some professionals say urine tests for ethanol, gamma-glutamyl-transferase, serum uric acid, high density lipoproteins and for mean corpuscular volume are warranted<sup>84</sup>. However, other researchers argue that urinary tests for ethanol are unreliable and blood alcohol levels (by either blood or breath testing) are recommended when suspicion is high<sup>105, 106</sup>. Finally, the eyes should be checked for the presence of retinopathy; the feet examined for signs of foot complications; an electrocardiograph (ECG) undertaken to check cardiac status; and an immunisation check with subsequent opportunistic immunisation should take place<sup>107</sup>.

The World Health Organisation<sup>66</sup> diagnostic criterion for diabetes mellitus is a fasting blood sugar level of greater than 7.8mmol/L on at least two doctor's visits, and/or a random blood glucose level (BGL) of greater than 11.1mmol/L<sup>35</sup>. The blood is monitored for levels of HbA1c (glycosylated haemoglobin, that is glucose binding with haemoglobin molecules). An 'oral glucose tolerance test' (OGTT) is undertaken if fasting BGL is unequivocal<sup>108</sup>. A dose of 75gm glucose is administered and the blood glucose level (BGL) is taken 1 and 2 hours after the drink. If this post-prandial BGL is >11.1mmol/L it would indicate diabetes and between 7.8 and 11.1mmol/L indicates impaired glucose tolerance. It should be noted that these levels are problematic if the person drinks alcohol regularly<sup>109</sup>. Aboriginal clients are considered to be a high risk group, so those over 35 years or those with hypertension, obesity and/or a first degree relative with diabetes, and those who have a fasting BGL of 5.5 should be re-tested yearly and opportunistically, depending on context and lifestyle issues. Those with a BGL of 5.5–6.9 should have a follow up OGTT<sup>35</sup>.

Couzos<sup>17</sup> suggest using analysis equipment that provides a rapid glycated haemoglobin estimation from a finger prick blood specimen be used in remote communities. It provides a result in nine minutes, which reduces the need for multiple review visits. This is more acceptable to Aboriginal people, because bloods can be taken in the field, thus providing more accurate measures so that management plans can be effected rapidly, and with minimal disturbance to the clients. Use of opportunistic screening is recommended for all Aboriginal clients<sup>29</sup>. Good improvements in diabetes prevention and care outcomes have been documented where AHWs engage in a recall system within the local community<sup>8</sup>.

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## ***Obtaining a history regarding diabetes***

The history is an important part of the assessment of any patient with diabetes and even more so if there are multiple comorbidity health needs. The diabetes related history should include information regarding:

- *Symptoms*: such as glycosuria, polyuria, polydipsia, polyphagia, weight loss, nocturia, malaise, fatigue, vision disturbances ...
- *Predisposition factors*: age >40 years, family history, ethnic group, overweight, hypertension, obstetric history of large babies or gestational diabetes, medication causing hyperglycaemia ...
- *Risk factors for complications*: family history of cardiovascular disease, smoking, hypertension, hyperlipidaemia, medication, (check symptoms for cardiovascular, neuro, sexual and bladder function, feet, infections etc)
- *Lifestyle factors*: tobacco smoking, alcohol, other drug use including cannabis, occupation, eating, and physical activity ... (being sensitive to cultural issues, power relationships, and structural impediments such as affordability, availability and access to nutritious food and clean water<sup>29</sup>).

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## ***Obtaining a history re alcohol use as part of the assessment for the person with diabetes***

NHMRC guidelines suggest early detection of hazardous drinking may help alleviate the compounding problems diabetes exacerbates in Aboriginal people, thus obtaining an alcohol history and undertaking an assessment to screen for problem drinking should occur within the complete health assessment<sup>17,24</sup>. Alcohol intake is usually under-reported. All Aboriginal people should be asked, 'Do you drink alcohol, including beer, wine, or spirits?' If the person responds 'No', the health worker should ask the follow-up question, 'What made you decide not to drink?' If the person is a lifelong abstainer or has been in recovery for more than five years, the screening process is complete. If not, a simple screening tools such as the CAGE, MAST, AUDIT or TWEAK questionnaire may be incorporated in the history to determine if the person is at risk from their drinking or is alcohol dependent<sup>110</sup>.

Obtain a history that includes:

- any previous periods of abstinence, withdrawal experiences and complications, previous treatment/intervention used, and factors that may be helpful or hinder future treatments<sup>111</sup>;
- other complicating medical problems: focus on liver, nutrition, diabetes, neurological, cardiovascular, psychiatric etc.
- support, barriers to intervention, goals and expectations of treatments;
- observe client behaviours although this may be unreliable. An assessment tool known as a 'Alcohol Symptoms Checklist' is showing some promising<sup>112</sup>.
- Information from collateral informants. These are generally reliable regarding drinking frequency, but less reliable on quantity because recollection has been found to be influenced by the subject's behaviours when drinking<sup>112</sup>.

Table 2 Check list for diabetes assessment<sup>28, 113, 114</sup>

Screening Assessment	At Diagnosis	Follow-up	Annual Assessment
Fasting BGL	*	*	*
Post prandial BGL	*	*	*
HbA1c	*	-	*
Lipids & Cholesterol	*	* p	*
Triglycerides	*	* p	*
Electrolytes NB Serum urea and creatinine	*	-	
LFT & TSH Liver function, Thyroid Stimulating Hormone	*		*p
Vitamin B12	*		
Microalbuminuria	*	*p	*
General physical examination	*	-	*
History (include immunisation)	*	*p	*
Blood pressure	*	*p	*
Weight/Height/Girth	*	*	*
Body Mass Index	*	*p	*
Urinalysis/ MSSU	*	*	*
Detailed foot examination	*	* p	*
Visual acuity	*	*	*
Ophthalmoscopic examination	*	*	*
ECG: Cardiograph	*	* p	* p
Medication	*	*	*
Injection points (if IDDM)	-	-	*
Education re:			
Diet	*	*	*
Self monitoring	*	*	*
Hypoglycaemia	*	*	*
Wellbeing	*	*	*
Dental check	*	-	*p
Opportunistic Immunisation	*		* Pneumococcal (every five years)
		'P' denotes problem previously exists	

## Alcohol assessment tools

Using a self-report questionnaire is an important part of the alcohol assessment. Tools such as **CAGE**<sup>115</sup>, **TWEAK**<sup>116, 117</sup>, **MAST**—Michigan Alcohol Screening Test<sup>118</sup>, **AUDIT**—Alcohol Use Disorders Identification Test<sup>119</sup> can be good starting point for obtaining a history<sup>112, 120</sup>. The **AUDIT** and **MAST** tool effectively identify hazardous drinking and the **TWEAK** is considered more useful for risky drinking during pregnancy and for adolescents<sup>121</sup>. Dawe et al recommend a modification (items four and 7) to the 10 item **AUDIT** instrument as the most reliable tool for use in Indigenous communities<sup>122</sup>.

The **CAGE** tool includes questions answered during the interview<sup>84</sup>.

Has the client experienced:

- *Cut down*: Have you ever felt you ought to cut down on your drinking?
- *Annoyed*: Have people annoyed you by criticising your drinking?
- *Guilty*: Have you ever felt guilty (or ashamed) about your drinking?
- *Eye opener*: Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?

If the client answers one or two ‘yes’ answers to these four questions than further assessment is recommended.

**TWEAK**© test is better for adolescents and can be asked during the history interview:

- *Tolerance*: How many drinks can you hold?
- *Worried*: Have close friends or relatives worried or complained about your drinking in the last year?
- *Eye opener*: Do you sometimes take a drink when you first get up?
- *Amnesia*: Has a friend or family member told you about things you said or did while you were drinking that you could not remember?
- *K cut down*: Do you sometimes feel the need to cut down on your drinking?

The **AUDIT** instrument is a ‘best practice standard’ in Australia based on its reliability and demonstrated cultural transferability which has been validated in 11 countries<sup>30</sup>. Additionally, it has been administered to Aboriginal people by interview when their literacy and comprehension skill are inadequate. Some Indigenous health workers had problems with the questions relating to guilt and remorse about drinking in the **AUDIT** tool, and instead chose to use carefully worded questions around binge drinking and average daily consumption<sup>31</sup>. However, the absence of controlled research in the delivery of the instrument and the interpretation of findings should caution users as to its absolute reliability<sup>122</sup>. Even with possible deficiencies in screening tools it is considered better to use an imperfect screen than to undertake no screening<sup>26</sup>. Many professionals use the **SADQ—C** Severity of Alcohol Dependence Questionnaire<sup>123</sup> if they believe the client is drinking heavily, as it is a reliable assessment tool, rather than a simple screening tool. For clients possibly withdrawing from alcohol the Alcohol Withdrawal Scale (**AWS**) quickly assesses worsening agitation, orientation, hallucinations, temperature, tremor, anxiety and sweating. Always follow the alcohol assessment instrument by using a structured diagnostic interview on consumption patterns (amount, frequency and circumstances of alcohol use) and alcohol related life patterns.

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## ***Assess via physical examination for alcohol related disease***

- Evidence of physical effects of alcohol use such as, recurrent physical trauma, scars, alcohol feter (odour), withdrawal tachycardia, hypertension, tachypnoea, nausea, vomiting, diarrhoea, polyuria , agitation, anxiety, tremor, insomnia, depression, seizures, confusion, perspiration etc.<sup>24</sup>
- Evidence of coexisting alcohol related disease such as jaundice, Cushingoid appearance, red eyes, facial capillaries, spider naevi, palmar erythema, Dupytren's contracture, hepatomegaly, hypertension, peripheral neuritis, pancreatitis, impotence etc.<sup>24</sup>
- The assessment must include biochemical tests such as blood alcohol level measures to indicate recent use; liver enzymes (GGT, SGOT, GHD, AST, ALT, LDH). These may need to be adjusted in chronic alcohol users, and people with diseases that raise the MCV (Mean Corpuscular Volume) or HDL (High Density Lipoprotein), or those producing markers non specific to alcohol use<sup>112</sup>. Elevated liver enzyme—GGT levels are present in 70 per cent of heavy drinkers. While not entirely reliable, GGT is considered to be the most sensitive test of early liver dysfunction and alcohol intake<sup>32</sup>. Note that in one study, elevated MCV levels in combination with elevated GGT levels were observed in 90 per cent of clients who were heavy drinkers, but caution is needed as a normal or a low result must not be assumed to indicate no liver abnormality exists.

# Diabetes—The interventions

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## ***Prevention strategies to reduce morbidity and mortality***

The suboptimal management of diabetes in Australia in the context of poor Indigenous health and this population's concomitant comorbidity health needs, is a cause for concern and requires ongoing education and support<sup>108</sup>. The goal of all prevention strategies is to prevent and reduce complications and excess mortality where diabetes is an underlying contributing cause. This can be done using primary prevention education programs that focus on reducing obesity and improving easily accessible nutrition by facilitating community understanding of the need to decrease intake of saturated fats, salts, sugars and alcohol. The management of diet is critical to good glycaemic control. The diet aims to restrict refined carbohydrate intake and increase carbohydrates high in natural fibre, by consuming low glycaemic index food<sup>35</sup>. Those requiring weight loss to improve insulin resistance should reduce saturated fat intake to less than 10 per cent of their energy intake<sup>36</sup>. Additionally, primary prevention education should focus on increasing community low level aerobic exercise such as walking for half an hour per day and quitting tobacco smoking. There are successful programs being conducted, such as that run at Noonkanbah where people are 'now rejecting a sit-down and do nothing lifestyle'<sup>124</sup>. Secondary prevention strategies would include well targeted population based opportunistic screening programs that monitor blood glucose levels (BGL), fasting BGL, glucose tolerance tests, post-prandial glucose test, renal function, blood pressure, hyperlipidaemia, and microalbuminuria. They include increasing public awareness of the need to re-screen every two years and of the need for the development and maintenance of diabetes and chronic disease registers that will provide an epidemiological basis for early intervention and treatment. While tertiary prevention would involve screening for complications of diabetes such as blindness (retinal screening), cardiovascular disease, end stage renal disease, foot disease<sup>17</sup>. We would advocate the inclusion of screening for comorbidities and especially those related to harmful drinking.

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## ***Education to improve participation in client management plans***

The management of diabetes is increasingly evidence based<sup>125</sup>. Interventions will vary based on context, assessment and available resources. One key component of all client management plans includes information about diabetes and education regarding self-care strategies<sup>111</sup>. The education regime recommended by Couzos includes counselling regarding weight, exercise, nutrition, smoking, alcohol use and foot care<sup>17</sup>. All of these educational goals need to take into account cultural diversity and appropriate language and learning styles.

Newly diagnosed persons with diabetes may be prescribed medication to control blood glucose levels. These may be oral hypoglycaemic drugs such as Metformin, sulfonylureas and/or insulin therapy. Clients need to be educated and aware of how these medications work, and the possible side effects and lifestyle factors they should watch for while using these medicines. For example sulphonylureas should not be

used as first line therapy with Aboriginal clients who may have an excessive alcohol intake, increased weight, or be at risk of frequent hypoglycaemic complications<sup>18</sup>.

Instead the preferred approach is through the use of Metformin or Insulin.

Additionally, clients with a history of binge drinking (5 or more standard drinks in a session) and abnormal liver function tests, should not be given Metformin, because it increases the risk of lactic acidosis<sup>37</sup>. If insulin therapy needs to be commenced, education regarding self-administration via subcutaneous injection must occur. The medication is adjusted until the fasting glucose lies between 5–6mmol/L.

Complications increase the risk of premature death, particularly macrovascular complications of the circulatory system, which account for over half of deaths in persons with diabetes<sup>6</sup>. People with comorbidity of high blood pressure, high cholesterol and those who smoke increase their risk of premature death dramatically<sup>6, 126, 127</sup>. Therefore treatment of hypertension is particularly important for people with diabetes who should be treated with ACE inhibitors unless there use is contraindicated<sup>114</sup>. Clients need to understand how to administer and manage these medications to control their blood pressure, but in addition, should be educated to use lifestyle improvements such as weight management, diet and exercise to help reduce blood pressure. Similarly hyperlipidaemia may be managed with medication and by measures to reduce saturated fat, cholesterol and trans-saturated fats. Aspirin is also useful because it blocks thromboxane synthesis reducing platelet aggregation and reducing the risk of cardiovascular events<sup>128</sup>.

Needless to say it is a challenge to make these decisions, implement prevention programs, and provide complex treatment regimens in an environment where living conditions are impoverished, educational levels diminished, and a general lack of personal and community resource are the norm. This is further complicated when the health system separates concomitant health problems of individuals and treats them by a plethora of different 'experts' and regimes. What is needed is a functional, uniform and achievable approach to case management of a client with diabetes who has comorbid health problems such as alcohol related diseases.

## Diabetes—The complications

Diabetes has a large number of associated complications classified as macrovascular and microvascular complications. About 75 per cent of these occur in the macrovascular system and include diseases such as coronary heart disease, peripheral vascular disease, and cerebrovascular disease. Diseases of the microvasculature include neuropathies (50 per cent), kidney nephropathy (30–40 per cent), visual disturbances such as retinopathy (20 per cent), infections (5–20 per cent), metabolic disorders (10–30 per cent), impotence (35–75 per cent) and complications during pregnancy (four to six per cent)<sup>68</sup>.

Macrovascular complications usually lead to microvascular complications, such as nerve damage<sup>10</sup>. Damaged nerves are the major cause of morbidity among people with diabetes due to decreased sensation especially in the lower limbs, which can lead to trauma, infections and subsequent need for amputation<sup>34</sup>. Poor peripheral circulation can lead to ischaemic changes, foot ulcers and necrosis of tissue. Consequently people need to be checked for hygiene, suitable footwear, orthopaedic problems, calluses and pressure areas on their feet, all of which contribute to disease<sup>129</sup>. Diets deficient in zinc, protein, vitamins A and C impede healing and compound foot problems so dietary education and supplements may be required. It is highly recommended that careful foot assessment occur so clients obtain early interventions. Health workers should note specifically the presence of ulcers, infection, corns, calluses, fissures, claudication, nail dystrophia or interdigital maceration<sup>114</sup>. Additionally, burns and other injuries, no matter how superficial that may be associated with heavy drinking should be noted and treated.

Impotence, gastrointestinal problems, limb pain, weakened muscles, diminished bladder and bowel control are largely due to neuropathy that occurs as a result of poorly managed diabetes. It is estimated in Australian studies that 14–20 per cent of people with diabetes develop neuropathy<sup>103, 130</sup>. The presence of protein in the urine may indicate kidney disease and is associated with hypertension and damage to the small blood vessels of the kidney. If uncontrolled this nephropathy develops into end-stage renal disease that requires dialysis and in severe cases kidney transplantation. Renal failure caused by diabetes is common among Aboriginal Australians. One central Australian study estimated renal disease was the direct cause of death in 22 per cent of Aboriginal persons with diabetes<sup>103, 131</sup>.

Damage to the small blood vessels in the retina causes diabetic retinopathy the most common cause of loss of eyesight in adult Australians under 60 years<sup>132</sup>. It can be treated with laser therapy if it is identified early. Glaucoma and premature cataract formation are also associated with diabetes and can lead to loss of vision.

It is imperative that Type 2 diabetes is well managed if complications are to be reduced<sup>34</sup>. The metabolic nature of the disease means it affects all body systems and people with Type 2 diabetes are increased hospital users for treatment of infections, amputations, kidney dialysis and transplants, laser therapy for retinopathy, and other specialist care. Premature death is the most serious result of diabetes, usually caused by one or more of the associated complications. Nationally, excess mortality in Australians with diabetes is approximately twice that of Australians who do not have the disease, and this is even higher among Aboriginal Australians.

# Understanding alcohol related disease in Australia

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## ***Alcohol use in Australia***

The use of alcohol is an accepted part of mainstream Australian culture. However, alcohol was implicated in the deaths of 3 271 people and the hospital episodes of a further 43 000 in 1998<sup>12</sup>. Data from the National Drug Strategy Household Survey 2001, stated over 80 per cent of Australia's population consumed alcohol in the previous 12 months, with between 8.3 per cent and 10.2 per cent of the population drinking daily<sup>12-14</sup>.

In terms of risk of harm in the long term, 10 per cent of males and nine per cent of females drank alcohol in a pattern that was risky or high risk. In terms of short-term risk, 24 per cent of males and 17 per cent of females drank at least once a month in a manner that was risky or high risk for short-term harm<sup>12, 14</sup>. Harmful rates are considered to be more than four standard drinks per day for males and two for females, and having less than two alcohol free days per week<sup>24</sup>. Australia has a per capita consumption of around 7.8 litres of alcohol per person per year with the greatest increase in consumption being a fourfold increase in wine drinking, which rose from 5.6 litres in 1965 to 19.7 litres per person per year in 2000<sup>14</sup>. Alcohol contributes to thousands of deaths yearly, so the importance of preventing harmful drinking cannot be understated<sup>133</sup>.

The National Indicators Project estimated 46 per cent of males and 32.5 per cent of current female drinkers consumed alcohol at levels considered to be high risk for acute harm. Among teenagers 14–19 years females (14.6 per cent) were more likely to consume at risky-high risk levels for long term harm compared to 9.6 per cent of males<sup>102</sup>. Women generally begin to become intoxicated at a later average age than men (26.5 versus 22.7), experience their first drinking problems later than men (27.5 versus 25), and exhibit loss of control over their drinking at a later average age (29.8 versus 27.2)<sup>110</sup>.

A comorbidity of mental illness is more common in women who are harmful alcohol users than in the equivalent group of men. A study by<sup>134</sup> noted 19 per cent of women diagnosed with alcohol dependence had major depression, compared with five per cent of men. These women exhibit higher rates of anxiety, loss of self-esteem, feelings of shame and guilt, compared to men who abused alcohol who tend to display antisocial behaviour. It is estimated that between 41–70 per cent of violent crimes in Australia are committed while under the influence of alcohol. The most common reason for being arrested for Aboriginal people involve crimes related to drinking<sup>135</sup>. The highest proportion of harmful drinking is evident in the 20–29 year old male group with 14.6 per cent doing so on a weekly basis<sup>24, 136</sup>. The WHO guidelines detailed in Table 3 below were used to quantify harmful drinking<sup>121, 137</sup>. The National Health and Medical Research Council guidelines aim to reduce harmful drinking, to < 40gm/day for males and < 20gm/day for females<sup>24, 121</sup>. To prevent intoxication men should consume no more than 60gm and women no more than 40gm<sup>138</sup>.

Table 3 WHO guidelines for risk of harm in short term from drinking alcohol<sup>121, 137</sup>

	<b>Low risk (Standard drinks)</b>	<b>Risky (Standard drinks)</b>	<b>High risk (Standard drinks)</b>
Males	to 6 on any one day and no more than 3 days per week	7–10 on any one day	11 or > on any one day
Females	Up to 4 on any one day and no more than 3 days per week	5–6 on any one day	7 or > on any one day

For risk of harm in the long term from drinking alcohol

	<b>Low Risk (Standard drinks)</b>	<b>Risky (Standard drinks)</b>	<b>High risk (Standard drinks)</b>
Males on an average day	Up to 4 per day	5–6 per day	7 or more per day
Overall weekly level	Up to 28 per week	29–42 per week	43 or more per week
Females on an average day	Up to 2 per day	3–4 per day	5 or more per day
Overall weekly level	Up to 14 per week	15–28 per week	29 or more per week

# Alcohol use among Aboriginal people

Cutter notes complications of diabetes are common among heavy drinkers and the management of diabetes is significantly more challenging when clients misuse alcohol<sup>18</sup>. Most of the Aboriginal health workers consulted in this project said it was almost routine for their clients with diabetes to have other comorbid diseases. Additionally, it was routine for their clients who drink hazardously to have comorbid Type 2 diabetes. The literature was examined to gain an understanding of alcohol use and its impact on the management of the Aboriginal client with diabetes.

Stereotypes abound regarding alcohol use among Aboriginal Australians. Many people think ‘all Aboriginals are drinkers’, but research demonstrates that Aboriginal people are less likely to drink than non-Aboriginal Australians. However, when they do drink they are more likely to drink at high or very high risk levels<sup>22-24</sup>. Additionally, the patterns of alcohol consumption differ between Aboriginal communities and the wider society, with Aboriginal people being more public drinkers and undertaking more harmful binge drinking<sup>21</sup>. A report by Alati notes a trend for Aboriginal clients to consume other substances in addition to alcohol<sup>51</sup>. However, the commonly perpetuated hypothesis that Aboriginal people metabolise alcohol differently to white Australians is not supported in the evidence based literature and imply genetic weakness which serves to increase stereotyping<sup>139</sup>. Health professionals have an obligation to debunk the myths and not to perpetuate them. They need to ensure they reflect on their practice and examine attitudes that may influence the effectiveness of their service and care toward this client group<sup>139</sup>.

Cawte<sup>140</sup> found many Aboriginal people had mild to moderate depression that responded readily to treatment and this continues to be the case, as recent research indicates the severity and wide spread impact of grief, sorrow and mental distress by whole communities<sup>55</sup>. The *National Mental Health Strategy* notes the alarming comorbidity of mental health issues and alcohol misuse<sup>15</sup>. This was verified in a recent study by de Crespigny who found strong links between mental health disorders and coexisting heavy use of alcohol and other drugs<sup>53</sup>. Key causal factors for excessive drinking amongst Aboriginal Australians is argued as political, pertaining to racism and deprived socioeconomic status<sup>21, 55, 141-143</sup>. Many of the factors influencing alcohol misuse mirror those affecting mental health<sup>129</sup>. The factors influencing poor mental health and harmful alcohol use include: dispossession from land and culture, loss of role, lack of adequate education, low self-esteem and self-worth, unemployment and under-employment, low income and high costs, lack of opportunity for success, racism and oppression, drinking patterns and customs, and the alcohol content of drinks<sup>37</sup>.

The non-Aboriginal responses to Aboriginal alcohol use over the last four decades has varied from protection because of perceived inadequate self-control, to incarceration for ‘deviant’ behaviour, to the introduction of harm reduction social health models such as sobering-up shelters, introduction of dry zones, night patrols and decriminalisation<sup>17</sup>. The Aboriginal community is concerned about the impact of excessive alcohol and/or other drug use on the morbidity and mortality of their people, even though the proportional per centage of Aboriginal people falling into this category is less than in the non Aboriginal community<sup>21, 25-27</sup>. Various preventative actions have been trialed in some communities and the most successful ones include programs that influence and control the availability of alcohol, such as, dry communities, altering or restricting licensing hours and requirements concerning the sale of alcohol, and the development of Aboriginal social clubs<sup>21, 144</sup>. Consultation

with and through Aboriginal elders in language they understand has the most success in community based programs, along with adopting processes that require ‘doing favours for one another’ rather than money changing hands<sup>145</sup>.

Specific interventions that reduce supply of alcohol seem to be having a positive effect<sup>144, 146-148</sup>. Projects such as the Julalikari Council night patrol by elders has reduced custodial rates for minor offences, improved liaison with police, increased use of sobering-up facilities and helped to resolve interpersonal disputes. Their program includes the introduction of an alcohol free day on *‘Pay Day Thursday’* which used to be the day when drunkenness was at its worst. It is now known as *‘Thirsty Thursday’* because no take away alcohol is sold, all cask wine sales are banned and only light beer is available before midday<sup>145</sup>. Many remote areas have introduced night patrols and ‘sobering-up shelters’ in the community so people have specific safe places to access when they are intoxicated and need to ‘dry out’<sup>149, 150</sup>. There has been a protective effect noted in communities that are long distances from retail outlets. Interestingly, Aboriginal clients with diabetes in communities farther away from alcohol retail outlets also have more control over their fasting BGL, have less obesity and are less likely to smoke<sup>101</sup>.

Most of the successful control measures are linked with overall reduction in alcohol consumption<sup>21</sup>. In summary, programs are most likely to have success if the local community takes part in the planning, implementing and evaluating processes, ensuring programs are culturally appropriate and grounded in the local traditions, beliefs and practices of the people they are designed to serve. However, implementation and success of such programs remains less likely, or possible, in rural and urban Aboriginal communities.

# Effective strategies to manage the comorbidity of diabetes and alcohol related disease

Glycaemic control is difficult in the client group who use alcohol harmfully, therefore many are placed in the ‘too hard basket’ and control is not offered or attempted<sup>37</sup>. This project could find no significant research undertaken on clinical pathways or collaborative management plans and protocols that take into account the comorbidity of alcohol related disease and diabetes. The most recent guidelines for the treatment of alcohol problems<sup>30</sup> indicate the dearth of controlled research on effectiveness of treatment for clients with comorbid diseases. Again the definition of comorbidity appears to be related to mental health disorders, particularly anxiety and depression, and not comorbid physical problems. Research shows depression can lead to the person adapting increased use of health risk behaviours such as tobacco use, illicit drug use and alcohol misuse. As growing numbers of people are diagnosed with anxiety and depression this risk presents a major public health concern<sup>48</sup>.

How to research clinical pathways that manage dual diagnoses or comorbidities is a significant issue because, as<sup>64</sup> say, most Aboriginal people regard researchers with suspicion, because they have been ‘researched to death and beyond’. Additionally, randomised control studies may be the gold standard for clinical interventions, but they are difficult to implement in, and are not appropriate for, Aboriginal primary health care settings<sup>151</sup>.

This project had difficulty obtaining data and the researchers believe this was due to major gaps in the literature and no distinct protocols identified in place to manage comorbidity of alcohol related disease and diabetes. Most of the 16 agency informants in this project said they usually referred their clients to the appropriate health professional specialising in that specific disease area. Consequently, there were clients who did not or could not follow through with appointments due to the number of visits they needed to make to different health professionals. The feedback certainly indicates the current approach to management is to refer clients to specialist health professionals and services, and community treatment programs. Some participants noted they have made earlier requests for chronic disease management strategies rather than individual strategies for diabetes care, because many clients had comorbid kidney disease, heart disease, asthma, mental illness and alcohol related disease, but these requests have not been taken seriously or been acted upon<sup>33</sup>. Most informants recognised the importance of one management plan to care for the whole person had more likelihood of providing effective care. However, they said fragmented management was true for all clients with comorbidities who had to engage with a health care system structured around specialised and compartmentalised care.

## How should comorbid disorders be treated?

Participants who informed this report said their work with Aboriginal clients was rarely, if ever, managing just one disease. Most clients had comorbid disorders. Consequently, AHWs and other health professionals were faced with the vexing question of whether treatment should be integrated, parallel or adjunctive<sup>30</sup>. Many in this study expressed a lack of basic understanding of the importance of diabetes management amongst health workers, which translated to less education. There were often heavy work commitments for varied health promotion strategies and limited human resources, so education campaigns could only spread so far. Additionally, models that work for Aboriginal people living in urban areas do not always translate to remote areas with a more clan-based structure. Diabetes is not seen as an issue in many people's lives until it reaches a crisis point<sup>33</sup>. This problem is compounded when the client is diagnosed by doctors who do not refer clients to the local AHWs, because it can take time for coherent case management to commence.

The AHWs were clear that they wanted a partnership approach as this facilitated participation and accountability for the communities, and the professionals in the health system, while enhancing the scope and reach of their services. Wanders and Wilson note that an earlier 1997 document titled *The First Step* acknowledged four strong priority themes identified by Aboriginal people in South Australia<sup>33</sup>. The first included the need for more AHWs and for them to be working with strong support arrangements in place. The other key areas identified were diabetes, mental health, and substance misuse. The participants of this study noted the need for AHWs with particular expertise in diabetes management to be used in their area of expertise. Some of the graduates from diabetes courses were not being utilised in their communities and related health services, even though they had acquired up-to-date and applicable knowledge<sup>42</sup>. *The Future Pathways* report identified recommendations for improving the training and development of the Aboriginal health workforce<sup>43</sup>. Many of these recommendations have been put into place in the specialised diabetes courses conducted by King<sup>44-47</sup>. However, it appears that few, if any, AHWs have had basic or specialist training in the management of alcohol and other drugs. Given the prevalence of this problem and its impact on management of all comorbidities the research team feel this situation needs to be rectified urgently.

Further to that point this study identified the need to coordinate the areas of diabetes, mental health and substance misuse, into one comprehensive and flexible management plan. The 2003–04 Federal Budget set aside \$4.4 million (over two years) to the *National Comorbidity Initiative* to improve service coordination and treatment outcomes for clients with both illicit drug addiction and mental illness<sup>48</sup>. This study found that diabetes impacts on such large portions of the Indigenous community and its management is of such critical importance, particularly as some clients are discontinuing insulin therapy to accommodate drinking episodes. Thus the project team would ask the Government to consider directing some of that resource into management plans that address multiple comorbidities in Indigenous client groups. Such a measure could improve coordination across psychiatric/mental health and general medical services, drug treatment services, and Aboriginal health services and has the possibility of developing best practice guidelines that facilitate service delivery and increase professional education and training for Aboriginal health workers.

# Strategies the AHW may use to educate the client with diabetes who chooses to continue drinking alcohol

The two key strategies mentioned by participants that they believe are most effective involve AHWs helping the client with diabetes to cut down their drinking or stop drinking altogether, and help the client with diabetes to have an action plan ready for if/when they do drink.

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## ***Cutting down drinking***

Alcohol reduction in people with diabetes who drink excessive amounts is probably the most significant action to improve diabetic control and outcome that they can take<sup>37</sup>. Management should focus on alleviating symptoms and acute complications, regaining glycaemic control if possible, reducing risk factors, identifying and treating chronic complications and, if possible, preventing further complications. This is often an ideal focus, rather than a reality, but it should not deter health professionals from attempting to achieve glycaemic control. Cutter advises that some clients may find drinking reduction easier than abstaining, so suggesting that one to two standard drinks per day as relatively safe may be a more useful starting point, although expert advice would say this is arguable<sup>18</sup>. The approach of all client education should be advisory, personalised, skills based, encouraging and uncritical, so the client continues to engage with health professionals or AHW for their care<sup>18</sup>.

It should be noted that many central Australian Aboriginal communities are dry communities, so drinking problems are not such an issue in all communities. However, informants suggested that on the whole Aboriginal communities generally tolerated within their community members who drank hazardously, so monitoring diabetes and curtailing alcohol consumption may be more effective if followed up by the AHW, the family and the community elders as the preferred option. Lifestyle factors such as ceasing tobacco smoking, monitoring and modifying diet, and reducing alcohol intake, are more achievable when supported by the AHW and the family, as well as a health professionals such as a doctor or registered nurse<sup>37</sup>. Behavioural therapy for heavy drinkers such as self-control training, marital therapy, relaxation therapy and stress management have all been found to work amongst some non Aboriginal English speaking groups, but with varying degrees of success<sup>84</sup>. No research was located to indicate their effectiveness in Aboriginal communities. Group therapy approaches have been less successful when Aboriginal people are placed in with non-Aboriginal groups, and our informants agreed<sup>18</sup>. In these situations they recommend one to one counselling and support.

Some clients with alcohol related diseases are given Disulfiram ('Antabuse') as aversion therapy due to its ability to increase ethanol breakdown, but this drug can make the client feel really sick if they drink while using this medication. Additionally, it cannot be used for clients with comorbidity of diabetes as the client shakes, vomits, and sweats if they drink<sup>84</sup>. Other interventions include correction of vitamin deficiency (particularly thiamine), mood stabilisation, and possibly Acamprosate or Naltrexone to help reduce the urge to drink. Naltrexone and Acamprosate act on the neurotransmitters that control reward pathways in the brain. Naltrexone blocks

opioid receptors and for the socially stable heavy drinker it may motivate them to abstain from drinking<sup>84</sup>. These interventions may be used in conjunction with psychiatric assessment and possible related treatments, psychotherapy, and often a '12 step' program<sup>152</sup>. Again, no studies were located where the use and success of these interventions have been reported for Aboriginal people.

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### ***Help clients to adopt an action plan if they intend to drink***

Given the impoverished circumstances of many Aboriginal people and the aforementioned impediments to wellbeing, many of the strategies identified in the literature and listed below will be difficult to implement. Consequently, strategies such as these will have to be modified or new ones developed that would have more opportunity to work. Some informants felt the AHWs and other health professionals needed information to help people with diabetes to develop action plans if they were going to drink. While it is recognised that once diabetes is established, alcohol is a complicating factor in glycaemic control, it is a reality that some people with diabetes still choose to continue drinking. It will be helpful for clients to have a basic understanding of these three questions before devising an action plan. What is a fast and slow acting carbohydrate? How does the liver work? What is a standard drink? The strategies gleaned from current literature say the AHW might discuss the following points with the person who has diabetes and chooses to continue drinking alcohol, and then help them to develop a workable strategy using this information as the starting point:

- eating a carbohydrate before drinking will help glucose levels in the blood because the liver stops making glucose once alcohol is ingested (you may find you get the munchies late at night after you have been drinking because the liver stops converting glycogen into glucose);
- diet/light beers do not have sufficient carbohydrate to negate the hypoglycaemic effects of the alcohol, so hypoglycaemia can ensue<sup>153</sup>;
- many low sugar beers are higher in alcohol content so are not recommended;
- many low alcohol beers are higher in sugar content and their alcohol content varies enormously so its best to check the alcohol level of what is consumed (the number of standard drinks is marked on the container);
- if drinking, it is advisable that the person drinks with, or after a meal, particularly if they are on sulphonylureas, or insulin medication (the meal may need to be bigger and contain more carbohydrate than usual);
- the person should know if the medications they are taking can be mixed with alcohol;
- a BGL monitor should be taken and the BGL checked during the evening;
- judgement may be slow, or even impaired when drinking so it is harder to remember to take medication, and make good food and drink choices;
- try not to forget to take their diabetes medications with them, and keep it with them, so they have it with them in case they need it to take an extra dose;
- remember that each drink counts toward the daily carbohydrate or calorie intake;
- mixed drinks are often 'sugary' so avoid soft drinks and liqueurs<sup>154</sup>, although diet drink and low joule mixers are alright;

- rather, stick to simple drinks such as wine and beer that are more reliable than complex mixed drinks;
- remember to drink sensibly aiming to stop at two standard drinks per day (the complications of drinking with diabetes are discussed, e.g. higher risk of hypoglycaemia and the fact intoxication masks hypoglycaemia; worsening metabolic abnormalities and possible liver disease);
- try to stay away from binge drinking (five drinks or more in one session; or heavy drinking lasting some days) as this is really risky;
- try not to exercise before drinking as this lowers the blood glucose level, and alcohol will lower it further (so if they are intending to dance or play sport it might be safer not to drink);
- a high carbohydrate snack is carried (remember: glucagon will not help alcohol induced hypoglycaemia);
- alcohol effects the BGL for about 24 hours after it has been ingested so they can have 'hypo' in the middle of the night or even the following day (it will help eat a carbohydrate snack before going to bed);
- although it may not apply to a remote area community, if they are living in an urban community they might consider setting an alarm to check their BGL in the middle of the night and eat if necessary as a precaution<sup>38</sup>;
- it is useful to have at least one person in the group know that the person has diabetes. They should understand the symptoms of a 'hypo' (hypoglycaemic episode characterised by confusion, dizziness, shaking, pale skin), and know what to do (get some glucose), because a 'hypo' can resemble intoxication and treatment may be delayed or inappropriate (carry small wallet/purse sized card available). That person should be responsible for getting medical attention if the person vomits, or loses consciousness; and
- wherever possible they should wear a medic alert stating they have diabetes.

It is important that the client understands that the AHW or other health professionals is not advising that the person should drink. This discussion just acknowledges that the choice to drink remains with the client. If they are very careful they may be able to drink with less risk of adverse harm. It is recognised that these guidelines are extensive, however, they can be discussed in an informal manner so the client can make an informed choice about drinking. They should have an understanding of the possible risks and consequences, and what they can do to prevent or reduce possible harm to themselves and others.

# The learning needs of Aboriginal health workers and clients

The telephone discussions and feedback from AHWs and others professionals working with Aboriginal clients who have comorbidity of alcohol related disease and diabetes indicated several common learning needs for Aboriginal health workers. These include:

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## ***Understanding the arguments about the protective factors of alcohol use***

Research suggests a 'U' shaped curve for the relationship between alcohol and cardiac disease. There is a documented overall beneficial effect with mild/moderate (moderate one to two standard drinks /day) alcohol intake, which decreases death from coronary heart disease by increasing the release of high density lipoproteins<sup>155-157</sup>. However this data has been disputed and given the high rates of comorbidity and chronic disease among Aboriginal people, it is hard to see how there can be protective effects of alcohol for this client group<sup>158</sup>. Never the less there were informants who said AHWs needed to know the arguments for any likely protective effects of alcohol so they can be discussed with clients and the community.

It should be noted the research has only found these changes in short term alcohol use and no long range studies have been done as yet that demonstrate these benefits continue in the longer term. The effects of alcohol are not determined by what type of beverage is drunk<sup>36, 159, 160</sup>. It is believed alcohol has an anti-aggregatory effect on platelets, which causes an increase in insulin sensitivity, increases plasma HDL cholesterol, and has a favourable effect on fibrinolytic factors, which combine to explain some of the cardioprotective effects of alcohol ingestion<sup>20, 81, 159-168</sup>. Some of these cardioprotective factors are negated if the person is overweight, and this is particularly so for women<sup>80, 169, 170</sup>.

Moderate alcohol consumption has been associated with a decreased risk of Type 2 diabetes<sup>20, 159, 160, 162, 171</sup>. This risk of diabetes diminishes with light to moderate 'regular' drinking<sup>83, 165, 172</sup>. However, these benefits have not been verified in longitudinal studies and prolonged regular moderate drinking may instead lead to addiction, and a range of diseases. Recent research found lean men had a higher risk of developing Type 2 diabetes if they were heavy drinkers, whereas heavy men were at greater risk if they were moderate drinkers<sup>83</sup>. Again caution must be taken when applying this data to Aboriginal men and women whose overall health status is almost universally diminished.

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## ***Knowing what alcohol does in the client's body that impacts diabetes***

The client should have explanations of what alcohol does within their body and the likely effects that it has on their own health. They need to be given this information in a non-threatening manner, using language and a communication style that facilitates their understanding. For example they should know that alcohol is a psychoactive depressant that slows the brain and central nervous system, so it affects concentration, coordination and response time. Alcohol absorbs rapidly in the bloodstream in small amounts (one to two drinks). When a person drinks alcohol the liver stops metabolising fat to make glucose, so it can metabolise the alcohol from the blood<sup>38</sup>. It takes approximately one hour for a normal healthy adult male to metabolise ten grams of alcohol, but women metabolise alcohol more slowly than men. Women are more susceptible to the effects of alcohol because they have an increased bioavailability of alcohol due to decreased gastric alcohol dehydrogenase activity and first pass metabolism<sup>39</sup>. These metabolic processes lower the blood glucose level, which increase the risk for persons, especially when they drink on an empty stomach or shortly after taking insulin. If the person has a lean body mass the impact of alcohol will be compounded<sup>38</sup>. Researchers agree dietary changes affect the uptake of glucose and alcohol in persons with diabetes<sup>173</sup> but some say not adversely<sup>174</sup>. They do agree that alcohol stimulates the appetite which can lead to overeating and additional BGL problems for people with diabetes in the longer term<sup>175</sup>. Again caution is required as no studies have been identified that are specific to Aboriginal Australians.

Alcohol has a vasodilatory effect, but more than two drinks (>30–60gm) has a vasoconstricting effect, therefore blood pressure rises as alcohol intake increases<sup>20</sup>. For that reason binge drinking may result in acute blood pressure elevation and increased risk of stroke<sup>40</sup>. Additionally, it may interfere with antihypertensive medication<sup>36</sup>. Alcohol increases the release of Corticotrophin-Releasing Hormone (CRH) which stimulates Adreno-cortico-trophic Hormone (ACTH) which in turn increases sympathetic nervous activity, thus treating alcohol induced hypertension requires suppression of CRH using the medication Dexamethasone<sup>20</sup>. Alcohol intake elevates triglycerides levels, increases lipoprotein synthesis and inhibits fatty acid synthesis in the liver which combine to increase cardiac risk factors<sup>36</sup>.

Alcohol drops the BGL during the night after heavy drinking so the person with diabetes can be hypoglycaemic the next morning. For this reason people who are insulin dependent or those on long acting sulphonylureas are at increased risk of hypoglycaemia after drinking heavily<sup>37</sup>. This may be due to a reduction in nocturnal growth hormone<sup>176</sup>. The effects of excess alcohol are reversed after abstaining from alcohol for three days while monitoring metabolic control<sup>177</sup>.

High alcohol intake causes deterioration in short and long term glucose metabolism<sup>178</sup>. One study in Italy indicated people with Type 2 diabetes and high alcohol intake had high levels of postprandial glucose, free fatty acids and beta-hydroxybutyrate<sup>20</sup>. Heavy drinking can lead to severe alcohol induced hypoglycaemia in persons with either Type 1 or Type 2 diabetes by suppressing gluconeogenesis even at low doses, and even in the presence of low serum insulin and high serum glucagon levels<sup>36, 179, 180</sup>. Alcohol impairs glucose counter-regulation in clients with Type 1 diabetes<sup>109, 181, 182</sup>. It induces change in protein metabolism which affects blood glucose levels<sup>183</sup>. Alcohol increases insulin sensitivity in light alcohol users<sup>184</sup> however, reducing alcohol from heavy to light drinking does not improve insulin sensitivity<sup>165, 185</sup>. If the client on sulfonyluric drugs (insulin release stimulating drugs) such as chlorpropamide, glyburide, glipizide, and glimeperide, fasts from food the blood

glucose level plummets when alcohol is ingested<sup>41</sup>. Additionally, Metformin should not be used in patients with a history of binge or heavy drinking as it increases the risk of lactic acidosis. All of the above appear to counter any argument for 'controlled drinking' and favour abstinence as the preferred action for optimising diabetes management and well-being.

Alcohol is associated with death in persons with diabetes, and those countries where beer is consumed more than wine and spirits have a higher diabetes mortality rate<sup>186</sup>. This may be due to the high carbohydrate content of beer, with German beer having a glycaemic index of 74 per cent<sup>187</sup>. Clients with alcohol use disorders are often malnourished and when these clients have comorbidity of diabetes they may have rapid and severe hypoglycaemia within six to 36 hours of ingesting large amounts of alcohol due to suppression of gluconeogenesis<sup>188, 189</sup>. Clients with alcoholic liver disease may have exhausted hepatic glycogen stores by forgetting to, or not being able to eat. Additionally, they may have pituitary-adrenal axis and sympathetic nervous system disorders, which can contribute to the severity of their hypoglycaemia<sup>20</sup>.

The health professional should discuss the social effects of alcohol misuse that impact on health, such as alcohol being a contributing factor in domestic violence, assaults, child abuse and suicide<sup>190-192</sup>. Additionally they should highlight the increase risks directly attributed to alcohol misuse, which contributes to injury from motor vehicle accidents, falls, drowning and burns accidents. Family problems are often the contributing reason people drink, so discussion about these issues is important. Health professionals should take advantage of clinic time and current illness presentations to educate people regarding change in drinking habits, including cessation, as clients may be open to decreasing or ceasing their drinking when they are ill<sup>50</sup>.

Aboriginal people have a strong need to remain within their community and not be ostracised, so that factor needs to be kept in mind when choosing an appropriate time and treatment/education regimen concerning drinking issues and diabetes management<sup>145</sup>. The literature and discussions with Aboriginal health workers note that it is best if the AHW includes the family in education regarding diabetes management, especially if the patient uses alcohol, as this method has more success than teaching the client on their own<sup>17</sup>. The recent research review found few of the specialist Indigenous programs based on 12-step or abstinence principles were achieving high rates of continuing abstinence for this client group. However, some modest success was reported using family oriented programs<sup>121</sup>. Brady points out that it is helpful to use a strong formation of '... peer group (both adolescent and adult) which disvalue drug and alcohol use and which assist individuals to deal with the persuasive pressures of their kin and associates'<sup>193</sup>.

There is a need for professionals and lay workers to use brief interventions to raise the issue of risky alcohol use when interviewing clients especially for those living in urban communities. These interventions need to be linked to current and likely medical problems. The worker should not be patronising in their approach, rather they should provide relevant information in a manner that respects the patient's self-agency in considering their situation and making decisions. This must be done with respect and authenticity so the doors are kept open for when the client is ready to accept further advice and supportive treatment.

For those living in rural and remote communities informants in this study have pointed out that brief interventions have limited effect if the client presents with comorbid health issues and concurrent alcohol misuse problems. The literature was searched and no clear outcome studies were found that demonstrated effectiveness or not of brief interventions with Aboriginal drinkers.

People should know what potential health problems are aggravated by heavy alcohol intake and its acceleration and exacerbation effect on complications. Excess alcohol has been linked to the increase in renal disease in Aboriginal people<sup>16</sup> and the complication of injuries and infections such as pneumonia<sup>17,18</sup>. Other health problems provoked by heavy alcohol use include: neuropathy, hypertension, liver disease (cirrhosis), some cancers (throat, mouth, oesophagus), gastritis, peptic ulcers, pancreatitis, pregnancy (foetal growth retardation), cardiovascular diseases (e.g. Cardiomyopathy), haemorrhagic stroke, heart failure and reduced cognitive function leading eventually to dementia<sup>19,20</sup>.

# Project recommendations

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## ***Recommendations for education re comorbidity assessment and management***

The extant literature was searched to locate recent findings that indicate the learning needs of Aboriginal Health Workers and other health professionals working with Indigenous people who present with comorbidity of alcohol related disease and diabetes. A South Australian needs analysis conducted by Wanders and Wilson (2000) indicated a series of important issues some of which have been confirmed by informants in this project<sup>33</sup>.

There is an ongoing need for flexible training and education regarding comorbidity client management plans. Informants reported that health workers of all levels involved in Indigenous health care need to have a sound understanding of diabetes and the effect it has on individual and community health. Participants believed the person most suited to manage the long term care of the client who used alcohol and had comorbid diabetes, was the AHW with a sound knowledge of diabetes and alcohol management. More effective interventions are achieved in treating alcohol use when an AHW who understands Aboriginal needs delivers services providing they have access to, and are supported by other relevant health professionals<sup>194</sup>. This concurs with findings discussed in the latest guidelines for the treatment of alcohol problems and the accompanying evidence review<sup>30, 121</sup>. We would add that AHWs and other health professionals must have a sound knowledge of assessment of alcohol related problems and their management, particularly in clients with comorbid diseases such as diabetes, and the informants in this study agreed. Referral to too many agencies is counterproductive unless there is one agreed management plan and all the client's health workers should adhere to that plan by effectively communicating with one another. Given the huge impact drinking has on diabetes management, it is imperative that the health workers manage both issues concurrently, and ongoing and relevant education needs to be delivered in an effective manner to meet their needs.

The clients need to access information produced in Aboriginal user-friendly format that uses succinct messages and colourful visual aids with local symbolic meaning as these can have more effect than writing<sup>195</sup>. Suggestions were made to produce materials from local workshops so people can use them and see their own people giving the health messages e.g. photo boards, posters, letters, radio adverts, jingles and action plans. When these are produced 'on the spot' it increases community ownership and links the message to the local people<sup>196</sup>. Promotional media should be culturally sensitive and use recognised visual cues and language of the local Aboriginal community. Examples include videos, anatomical models, posters, pamphlets and flip charts that use traditional pictograms containing Aboriginal concepts and metaphors to tell the local story. For captions use the local language and English. If possible use existing community structures and link all information to concepts that have high social capital within that particular community<sup>59</sup>.

Some participants have had considerable success with oral history, story telling, role playing and sharing group experience in providing health promotion messages. Informants suggested that including Aboriginal people and existing networks, and working with them from the outset to train other local Aboriginal in the use of educational materials in their community, would be useful in relation to dealing with diabetes and heavy drinking comorbidity issues.

One informant suggested that AHWs and other health professionals might have more success in helping clients with case management by setting management goals around the question ‘What are the issues of living well with diabetes and drinking problems?’ She said the ‘fear factor’ of chronic disease can prevent clients from adhering to their particular management plans, as they all know many people who have died from diabetes and alcohol related diseases, so they give up on their management plan if it becomes too difficult to adhere to. For effective management plans the AHW needs to work out with clients ‘What is the most important thing in the client’s life right now?’. This is because what is termed by professionals as ‘non-compliance’ is often the client prioritising their social and family business. For example, if a death has occurred in the community, ‘sorry business’ will be given priority over issues such as an appointment with a health professional for a diabetes assessment.

Similar issues occur around diabetes and alcohol comorbidity management strategies which may can easily be subordinated to family business, so a more holistic approach to client management should be used. The AHW should help the client to ‘put the puzzle pieces’ of the management strategy together. This requires the AHW maintaining open communication with all health professionals and community workers dealing with that client. To have any chance of success it will take time and multiple consultations to build trust and rapport with the client and more particularly their family/community. The plan will need to have contingency strategies so that unexpected situations can be dealt with better.

Working with the people the client ‘hangs out with’ is just as important for good management as having a ‘client only’ strategy. Consequently, AHWs need to learn how to educate and set goals with the client and their family, and help clients maintain their management goals. However, the logistics of implementing such strategies can remain elusive, because most AHWs are also inundated continually with crisis health management issues in their communities and they need support and resources from colleagues, community leaders, employers and their wider health team to maintain their ability to assist their clients over time.

# Recommendations for changes to Aboriginal health worker curriculum

The role and scope of the AHW can be very broad and includes activities as diverse as cultural brokerage to sewage management, dog control, health checks, childcare and social work. Yet it also includes mainstream health activities such as screening, counselling, prevention, education and treatment activities<sup>43</sup>. Some informants were unclear of AHW scope of practice regarding diabetes management verifying earlier research<sup>49</sup>. The preparation of a comprehensive ‘all round’ AHW takes time, education, resources and support. It is imperative that those in a position to employ AHWs, make sure they clearly delineate the AHWs role and scope of practice. The literature and informants in this study identified several core subject areas that AHW preparation should cover to prepare workers in managing clients with comorbid diabetes and alcohol related disease, and these are discussed below.

## Improved understanding of particular at-risk client groups

Just being Aboriginal puts a person in a high-risk category for diabetes and comorbidities. Other high-risk groups include drinkers and substance users, those with mental illness, renal disease, obesity and the other lifestyle risk factors that have already been discussed. The presence of comorbid metabolic and endocrine disorders, infection, injury and other disease puts people at even higher risk. Additionally, some Aboriginal prisoners develop diabetes while in prison, possibly due to a combination of high calorie diet and reduced activity<sup>197</sup>. These risks are compounded for Aboriginal heavy drinkers in custody who are at increased risk of alcohol withdrawal and alcohol related disease.

## Developing cultural understanding

There is a tendency to assume all Aboriginal health workers are homogenous, offering them a ‘one size fits all’ curriculum. There is also an assumption amongst many non Aboriginal education providers that all AHWs hold the same cultural beliefs, and this is not necessarily so. Diversity exists between Aboriginal groups from urban and rural and remote areas as it does in all Australian society. Consequently AHWs need to develop their own cultural understandings via a ‘look, listen, learn’ model. Some particular points to pass on to AHWs and other health professionals include:

- While from diverse communities Aboriginal people do not generally conceptualise health as a uni-dimensional aspect of life. Health means life. For them health involves the whole-of-life and inter-relationships and inter-dependence between people, and between people and their land are as essential to their health as the management of disease<sup>59</sup>. Therefore it is important to take a broad perspective that includes control of the physical environment, without compromising community dignity, self-esteem, culture, spirituality, family and social justice.

- The client who is not self-managing as well as is hoped for presents a real challenge to the AHW. The AHW needs professional support to implement new strategies, because as Ellis (1996) points out the AHW risks personal backlash if they are not seen to be doing what is in the interest of the Aboriginal client, the family and community<sup>145</sup>.
- The need to inform clinicians from hospitals and mainstream health services that the responsibility of AHWs is to their client and community first and foremost, before the system, as this is the cultural expectation<sup>197</sup>.
- The need to be aware of the significance of the spiritual dimension to the Aboriginal person, and their community and their place, and its central role in health and healing<sup>145</sup>.
- The need to raise awareness and understanding of health issues in culturally sensitive ways via Aboriginal elders and other relevant networks, so the AHWs educated in understanding and managing diabetes can be accessed by the community<sup>53</sup>.
- The AHW and other health professionals need to understand how Aboriginal thinking may relate to despair of Aboriginal person and their community. Depression can be a response to trauma, grief, poor diet or low vitamin intake and depletion due to excess alcohol intake, and/or chronic illness. However, depression may also be linked to fear. The fear of doing something wrong on another community's land and then being punished ('pay back') is coupled with the fear of being shamed. 'Payback' can lead to one's thoughts being mediated by fear of retaliation, which in turn exacerbates depression. Payback cycles can be on-going and greatly increase anxiety and depression amongst AHW and community members. People who are depressed find it difficult to maintain the drive to exert their will, so alcohol use may then appear a valid option. Part of the secret to breaking this cycle lies in developing trust, rapport and sensitivity in the client/professional/worker relationship<sup>140</sup>.

## **Community development/community health promoting focus for care management**

There is a need to focus on promoting healthy behaviours that improve self-management of diabetes and alcohol use within a community setting. This means learning how to utilise and include family and elders in promoting health<sup>198</sup>. As Croumbie-Brown (cited by Wanders and Wilson)<sup>33</sup> states,

*In some respects the western model of health service delivery has been a reactive model. So if I am a GP or a nurse in some type of health delivery setting, I wait for a person to come to see me before I do anything. It does not work for Aboriginal health. We need a more proactive and community development approach where you establish relationships with the community, where you have presence in the community.*

## Methods to spread the prevention and health promotion message

AHWs may have difficulty in getting health promotion messages received effectively in their community<sup>33</sup>. Especially difficult is the healthy food message regarding high carbohydrate and fat intake. These following methods have been documented as having particularly good results with Aboriginal people:

- Using other people's stories<sup>199</sup>;
- finding the area of individual and community resilience and building upon this, so obtaining an accurate health history and assessment is important<sup>200</sup>;
- learning how to negotiate and facilitate policy that reduces or prohibits supply of alcohol, and improves the supply of fresh, affordable and reliable sources of healthy food (in rural and remote communities); and
- in the 1996 census half the Aboriginal population was aged 20.1 years or less<sup>59</sup>, so targeting health promotion messages at schools with high per centages of Aboriginal students, as well as other community groups of Aboriginal youth and children and their families.

## Specific course content regarding alcohol use

Over a decade ago a survey found that AHWs wanted additional Aboriginal content in the Training and Further Education (TAFE) Drug and Alcohol curriculum<sup>201</sup>.

Topics covered in the TAFE course that included options to study drugs and alcohol included communications, counselling, assessment and referral, prevention, education, complex cases, family methods, pharmacology, patterns of use, interventions strategies, crisis management, legal issues management and administration skills. However, in South Australia few AHWs have undertaken and completed these elective topics. Added to these topics were Aboriginal history, poverty, displacement and loss, identity, racism, stereotyping and substance use<sup>201</sup>. Some additional aspects were highlighted by informants. They include the:

- need for a sound understanding of the concept of a 'standard' drink<sup>50</sup>;
- pros and cons of various approaches to alcohol treatment and management with a particular focus on Aboriginal people;
- importance of accurate alcohol assessment<sup>51</sup>;
- process of developing a single, integrated and comprehensive, but achievable care plan for people with diabetes that takes into account comorbid health needs; and
- need to understand the impact of poverty, disadvantage, harmful alcohol use, and poor autonomy on diabetes risk factors such as obesity<sup>52, 53</sup>.

### **Areas requiring more education and support concerning diabetes management include:**

- methods of conveying healthy nutrition messages that take into consideration taste, easy preparation, low cost, availability of fresh ingredients, and safe storage issues when delivering the message. (Suggested methods of delivery included having a regular cooking day to share information about food content and labelling and low cost nutritious food);
- making clear the link between diabetes and lifestyle issues such as diet, exercise, injury prevention, tobacco smoking, drinking alcohol, medication and other drug use/use;
- improving young people's knowledge and understanding of the history of diabetes in their community and the impact it has on their families (use local stories and family trees to explore causes and impact);
- improving understanding of need to take prescribed medication;
- ensuring people have safe medication management skills and facilities;
- social factors of living with diabetes (share stories of experiencing life with diabetes to allay fears and demonstrate diabetes can be managed well. With a positive attitude one can care for one's self (e.g. role models such as Grannies).
- support for family and community members to provide parenting skills and positive role modelling regarding disease prevention, management and social development<sup>54</sup>.
- support AHWs to access training in basic podiatry as podiatrists, with basic foot assessment and care, and toe and finger nail cutting for people with diabetes.
- AHWs to have access to education on strategies and methods to increase the reach of diabetes education to people in positions of influence in their community, other health professionals, families and children in their community.

It is recommended that all Aboriginal health workers, general nurses and medical practitioners receive alcohol and diabetes education in their preparatory training, and in accessible continuing education and staff development.

## Recommendations for service providers

This study verified the need to improve service delivery, coordinated care and ongoing case management which was previously identified in the literature<sup>202</sup>. The informants in this study uncovered several barriers that need to be addressed by service providers:

### **Development of protocols that take into account the presence of comorbid diabetes and alcohol related disease**

These clients present a challenge to health workers and their care would be managed more appropriately if there was protocols and processes in place to develop personal care plans that meet the needs of this significant client group.

### **Provision of adequate access to appropriately educated service providers**

There were several cases of AHWs educated in diabetes management not being employed by the health services for that role because health priorities had altered. It is imperative that AHWs educated in diabetes management are linked to hospitals and health services within metropolitan, regional and remote health services. Once educated and in place they need to be used by the communities for the task for which they were educated.

### **AHW require continuing updates in the specific areas of clinical need of their client group**

This means they should be educated in the development and implementation of care plans that manage comorbid diseases in one client or one client group.

### **Prevent inappropriate responsiveness of services**

Informants noted that clients complained to them about being referred to too many different professionals and appointments being too far apart between visits. This was especially so for clients with diabetes, who required podiatry care. The problems were exacerbated when clients were given insufficient time with the health professional, so that key issues such as lifestyle were seldom discussed.

### **Prevent communication problems that can occur**

The informants noted the unavailability of bi-cultural workers or interpreters increased language difficulties and diminished understanding for their clients. Additionally, some mainstream workers were insensitive to the cultural needs of Aboriginal people, and inadvertently (perhaps even overtly) racist in their attitudes. All of these factors make a visit to the health professional an undesirable experience for the Aboriginal client and one that may drop from their agenda.

### **Provide up-to-date, consistent and quality information for clients and workers across the health continuum**

Informants reported that there were times when new knowledge and information on changes to protocols, supply schemes and treatment programs did not always filter down to the AHW and consequently to the client. Therefore strategies for continuing education and clinical updates are necessary.

### **Ensure the reliable supply of diabetes monitoring and assessment supplies**

The informants in the more rural and remote areas of the state sometimes had problems with the supply of diagnostic and monitoring materials. Additionally, the security of used injection equipment remain a problem in some communities<sup>33</sup>.

### **Ensure accurate datasets**

It is imperative to good service planning that reliable data is collected as to the prevalence of diabetes and alcohol related disease and other comorbidities. This information is required to plan effective care, project appropriate budgets, and dispense resources<sup>33</sup>.

## Conclusion

The prevention, early interventions and quality management of diabetes is critical to improving the morbidity and mortality rates of Aboriginal people. When people with diabetes engage in harmful drinking their health outcomes are further diminished and their lives are placed at great risk. Aboriginal health workers and other health professionals are frequently expected to help clients with comorbid alcohol related disease and diabetes to make decisions about their self-management. They do this without adequate preparatory and continuing professional education, and in a vacuum of approved evidence based, culturally sensitive protocols that can be implemented and accepted by their Indigenous clients. This report provides Aboriginal health workers and others with a basis for opening up discussion and considering the key issues and implications of this topic, particularly with their clients who may choose to drink when they have diabetes.

As such this project has provided a spring board for further comprehensive research, more informed education and training, and improved services and protocols of care for Indigenous people affected by diabetes in the context of heavy drinking.

## References

1. Teesson M, Burns L. *National Comorbidity Project*. Canberra: Commonwealth Department of Health and Aged Care, 2001.
2. Australian Bureau of Statistics. *National Health Survey: Aboriginal and Torres Strait Islander Results, Australia*, 2001. Canberra. ABS, 2002b. Cat. No. 4715.0.
3. Australian Bureau of Statistics. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples: AusStats Feature*. Canberra: Australian Bureau of Statistics, 2003. 4704.0.
4. O'Dea K. Diabetes in Aboriginal Australians. *Current Therapeutics*. 1996(March):25–28.
5. de Courten M, Hodge A, Dowse G, King I, Vickery J, Zimmet P. *Review of the Epidemiology, Aetiology, Pathogenesis and Preventability of Diabetes in Aboriginal and Torres Strait Islander Populations*. Canberra: Commonwealth Department of Health and Family Services, 1998.
6. Australian Institute of Health and Welfare. *National Health Priority Areas Report: Diabetes Mellitus*. Canberra: Australian Institute of Health and Welfare, 1998.
7. Australian Institute of Health and Welfare. *Diabetes: Australian Facts 2002*. Canberra: AIHW, 2002b. Cat. No. CVD 20 (Diabetes Series No. 3).
8. Australian Bureau of Statistics, Australian Institute of Health and Welfare. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2001*. Canberra: A joint program of the Australian Bureau of Statistics and the Australian Institute of Health and Welfare, 30/8/2001. ABS Cat. No.4704.0. AIHW Cat. No. IHW 6.
9. Australian Institute of Health and Welfare. *Australia's Health 2002*. Canberra: AIHW, 2002c. Cat. No. AUS 25.
10. Edith Cowan University. *Chronic Diseases—Diabetes*. Edith Cowan University. Available at: <http://www.healthinonet.ecu.edu.au/>. Accessed 7/4/2003.
11. Braun B, Zimmerman M, Kretchmer N, Spargo R, Smith R, Gracey M. Risk Factors for diabetes and cardiovascular disease in young Australian Aborigines: A 5-year follow-up study. *Diabetes Care*. 1996;19(5):472–479.
12. Australian Institute of Health and Welfare. *National Drug Strategy Household Survey. Detailed Findings 2001*. Canberra: AIHW, 2001b.
13. National Drug Strategy. *National Drug Strategy Household Survey. Detailed Findings 1998*. Canberra: AIHW, 1998.
14. Australian Institute of Health and Welfare. *Statistics on Drug Use in Australia 2002*. Canberra: AIHW, 2003. AIHW Cat. No. PHE 43, (Drug Statistics Series No. 12).
15. Commonwealth Department of Health and Aged Care 2000. *National Action Plan for Promotion, Prevention and Early Intervention for Mental Health 2000*: Mental Health and Special Programs Branch, Commonwealth Department of Health and Aged Care, 2000.
16. McLennan W, Madden R. Australian Bureau of Statistics, 4704.0. *The Health and Welfare of Aboriginal and Torres Strait Islander Peoples*. Canberra: Australian Government Publishing Service, 1997.
17. Couzos S, Murray R, eds. *Aboriginal Primary Health Care: An Evidence-Based Approach*. South Melbourne: Oxford University Press, 1999.

18. Cutter T. *A Clinician's Diabetic Manual*. Carlton: The Victorian Aboriginal Health Service Cooperative Ltd, 1989.
19. MacMahon S. Alcohol consumption and hypertension. *Hypertension*. 1987;17:387–402.
20. Bell D. Alcohol and the NIDDM patient. *Diabetes Care*. 1996;19(5):509–513.
21. Saggers S, Gray D. *Dealing with Alcohol. Indigenous Usage in Australia, New Zealand and Canada*. Cambridge University Press, UK, 1998.
22. Australian Institute of Health and Welfare. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 1999*. Canberra: Australian Institute of Health and Welfare, 1999.
23. Commonwealth Department of Human Services and Health. *National Drug Strategy. Household Survey. Urban Aboriginal and Torres Strait Islander Peoples Supplement*. Commonwealth Department of Human Services and Health, 1994.
24. National Health and Medical Research Council. *Australian Alcohol Guidelines: Health Risks and Benefits*. Canberra: Commonwealth of Australia, 2001.
25. Commonwealth Department of Health and Aged Care. *The Aboriginal and Torres Strait Islander Coordinated Care Trials National Evaluation Report: Volume 2 Supplementary Papers 1–5*. Canberra: Commonwealth Department of Health and Aged Care, 2001.
26. Commonwealth Department of Health and Aged Care. *National Recommendations for the Clinical Management of Alcohol-Related Problems in Indigenous Primary Care Settings*. Canberra: Australian Government Printing Service, 1999.
27. Hunter E. *Aboriginal Health and History: Power and Prejudice in Remote Australia*. Cambridge University Press, 1992.
28. Commonwealth of Australia, Department of Health and Aged Care. *National Diabetes Strategy 2000–2004*. Canberra: Commonwealth Department of Health and Aged Care, 1999. 2577.
29. Wakeman J, Grundy J. Diabetes Screening: Does it make a difference in the Aboriginal and Torres Strait Islander population? *Australian Family Physician*. 2001;30(12):1141–1144.
30. National Drug and Alcohol Research Centre. *Guidelines for the Treatment of Alcohol Problems*. Canberra: Commonwealth Department of Health and Ageing, 2003.
31. Brady M, Sibthorpe B, Bailie R, Ball S, Sumnerdodd P. The feasibility and acceptability of introducing brief intervention for alcohol misuse in an urban Aboriginal medical service. *Drug and Alcohol Review*. 2002;21:375–380.
32. Ordorica P, Nace E. Alcohol. In: Frances R, Miller Se, eds. *Clinical Textbook of Addictive Disorders*, 2nd Edn. New York, N.Y.: Guilford Press, 1998:91–119.
33. Wanders F, Wilson M. *Living with Diabetes: the South Australian Aboriginal Experience: A Strategy and Action Plan for Aboriginal Diabetes*. Adelaide: South Australian Aboriginal Health Partnership, July 2000.
34. Nutbeam D, Thomas M, Wise M. *National Action Plan: Diabetes to the Year 2000 and Beyond*. The Australian Diabetes Society, 1993.
35. Holmwood C, Phillips P, Harris P, Webster C, Colagiuri S. *Diabetes Management in General Practice*. Diabetes Australia, August 2002. NP 1020.
36. Franz M, Bantle J, Beebe C, Brunzell J, Chiasson J, al e. Evidence based nutrition principles and recommendations for the treatment and prevention of diabetes and related complications. *Diabetes Care*. 2002;25(1):1–122.

37. Couzos S, Metcalf S, Murray R, O'Rourke S. *Systematic Review of Existing Evidence and Primary Care Guidelines on the Management of Non-Insulin-Dependent Diabetes in Aboriginal and Torres Strait Islander Populations*. Canberra: Office for Aboriginal and Torres Strait Islander Health Services, Commonwealth Department of Health and Family Services; September 1997/1998. ISBN 06423667213.
38. Ford-Martin P. Drinking while Diabetic. What you need to know about diabetes. Available at: <http://diabetes.about.com/library/weekly/aa031201a.htm>. Accessed 2/4/2003.
39. Frezza M, Di Padova C, Pazzotta G, Terpin M, Baraona E, Lieber C. High blood alcohol levels in women. The role of decreased gastric alcohol dehydrogenase activity and first pass metabolism. *New England Journal of Medicine*. 1990;322:95–99.
40. Hillbom M, Forsander OA. Diabetes and the alcohol consumption of AA and ANA rats. *Acta Neurologica Scandinavica*. 1987;75(3):195–200.
41. Breecher M. Small amounts of alcohol slightly increases risk of low blood sugar in certain diabetics. *Web MD Health*. Available at: [http://my.webmd.com/content/article/20/1728\\_53401.htm](http://my.webmd.com/content/article/20/1728_53401.htm). Accessed 2/4/2003.
42. King M. *The impact of an Accredited Australian Diabetes Educators Association Course on the Experiences of Aboriginal Health Workers in South Australia* (Phd Thesis— in progress). Adelaide, Australia: School of Nursing and Midwifery, Flinders University, 2003.
43. Dollard J, Bradley H, Blue I, Fuller J, Hopps M, Moss J. *Future Pathways. Review of the Status, Support Arrangements and Training Needs of Aboriginal Health Workers in South Australia*. Whyalla Norrie: South Australian Centre for Rural & Remote Health (SACRRH); 1999:1–232.
44. King M. *Training of Aboriginal Health Workers*. Paper presented at The Australian Federation of University Women National Conference 'Indigenous Education and the Social Capital'. 18–19 June 1998, Adelaide.
45. King M, Hodes AM. Training Aboriginal health care workers. *CMAJ Canadian Medical Association Journal*. 2000;163(3):259.
46. King M, Wilson K. The teaching and learning principles of metropolitan Aborigines with diabetes. *Contemporary Nurse*. 1999;8(4):152–158.
47. King M, Sin A. An account from five Aboriginal health workers who undertook the Diabetes educators course conducted by Flinders University. *Aboriginal and Torres Strait Islander Health Worker Journal*. 1999;23(6):19–23.
48. Commonwealth Department of Health and Ageing. National Comorbidity Project. *Australian Government Department of Health and Ageing, Population Health Division*. 10 July 2003. Available at: <http://www.health.gov.au/pubhlth/strateg/comorbidity/index.htm>. Accessed 20/8/2003.

49. Curtin Indigenous Research Centre, Centre for Educational Research and Evaluation Consortium, Jojara & Associates. *Training Re-visions. A National Review of Aboriginal and Torres Strait Islander Health Worker Training*. Perth: Curtin University of Technology, 2001.
50. Hunter E, Brady M, Hall W. *National Recommendations for the Clinical Management of Alcohol Related Problems in Indigenous Primary Care Settings*: Office of Aboriginal and Torres Strait Islander Health, 2001.
51. Alati R. *The Role of Alcohol and Drug Rehabilitation and Treatment Amongst Aboriginal People: Handbook*. Melbourne: Commonwealth Department of Human Services and Health, 1996.
52. Daniel M, Rowley KG, McDermott R, Mylcaganam A, O'Dea K. Diabetes Incidence in an Australian Aboriginal population: An 8-year follow-up study. *Diabetes Care*. 1999;22(12):1993–1998.
53. de Crespigny C, De Bellis A, Cruse S, et al. *Better Medication Management for Aboriginal People With Mental Health Disorders and Their Carers: A Pilot Study in Northern Metropolitan Adelaide*. Adelaide: Flinders University School of Nursing and Midwifery, Aboriginal Drug and Alcohol Council, 2003.
54. Port Lincoln Aboriginal Health Service RDNS. *Look, Think, Act: Indigenous Stories About Living with Diabetes*. Port Lincoln: Royal District Nursing Service and Port Lincoln Aboriginal Health Service, 2002.
55. Kowanko I, de Crespigny C, Murray H. *Better Medication Management for Aboriginal People With Mental Health Disorders and Their Carers—Final Report 2003*. Adelaide: Flinders University School of Nursing and Midwifery & Aboriginal Drug and Alcohol Council, 2003.
56. National Health and Medical Research Council. *Guidelines on Ethical Matters in Aboriginal and Torres Strait Islander Health Research*. Available at: <http://www.health.gov.au/nhmrc/issues/asti.pdf>.
57. Australian Bureau of Statistics. *Deaths, Australia, 2001*. Canberra: Australian Bureau of Statistics; 2002c. Cat. No. 3302.0.
58. Bailie R, Runcie M. Household Infrastructure in Aboriginal Communities and the Implications for Health Improvement. *Medical Journal of Australia*. 2001;175:363–366.
59. O'Connor-Fleming M, Parker E. *Health Promotion: Principles and Practice in the Australian Context*. 2nd Edn. Crows Nest, NSW: Allen & Unwin, 2001.
60. Australian Bureau of Statistics. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*. Canberra: Australian Bureau of Statistics, 1999a.
61. House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs. *Health is Life—Report on the Inquiry into Indigenous Health*. The Parliament of the Commonwealth of Australia. Available at: <http://www.aph.gov.au/house/committee/fca/indhea/reportfinal.pdf>. Accessed 8/2003.
62. Reid J, Trompf P. *The Health of Aboriginal Australia*. Marrickville, NSW: Harcourt Brace Jovanovich, 1991.
63. South Australian Aboriginal Health Partnership. *South Australian Aboriginal Regional Health Plans. The First Step ...*. Adelaide: South Australian Aboriginal Health Partnership, 1997.
64. Atkinson J, Graham J, Pettit G, Lewis L. Broadening the focus of research into the health of Indigenous Australians. *Medical Journal of Australia*. 2002;177:286–287.

65. Brooks J, Prociw P, Luke RA. Australia hopes new strategy will improve health services for Aboriginal population. The changing epidemiology of human hookworm infection in Australia. *CMAJ Canadian Medical Association Journal*. 1995;152(9):1509–1511.
66. World Health Organization. *Definition, Diagnosis and Classification of Diabetes Mellitus and its Complications. Part 1: Diagnosis and Classification of Diabetes Mellitus*. Geneva: World Health Organization, 1999.
67. World Health Organization. *Prevention of Diabetes Mellitus: Report of a WHO Group*. Geneva: World Health Organization, 1994.
68. McCarty DJ, Zimmet P, Dalton A, Segal L, Welborn TA. *The Rise and Rise of Diabetes in Australia 1996: A Review of Statistics, Trends and Costs*. Canberra: Diabetes Australia National Action Plan, 1996.
69. Diabetes Australia Guideline Development Consortium, Sydney. *National Evidence Based Guidelines for the Management of Type 2 Diabetes Mellitus*. Canberra: NHMRC, 2001.
70. Commonwealth Department of Health and Ageing. Diabetes publications: Highlights of Government Support for Diabetes 1999. *Priorities and Quality Branch, Commonwealth Department of Health and Ageing*, 1999. Available at: <http://www.health.gov.au:80/pq/diabetes/pubs/diabetes99/focus/index.htm>. Accessed 4/4/2003.
71. The Expert Committee on the Diagnosis and Classification of Diabetes Mellitus. Report of the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus. *Diabetes Care*. 1998;21(Suppl 1):S5–S19.
72. World Health Organisation. Diabetes Association criteria for diabetes mellitus using WHO criteria. *Lancet*. 1999;354:622–625.
73. Parsons J, Wilson D, Scardigno A. *The Impact of Diabetes in South Australia 1999*. Adelaide: Diabetes Clearing House and the Department of Human Services South Australia;1999.
74. Cunningham J, Beneforti M. *Hospital Statistics: Aboriginal and Torres Strait Islander Australians, 1997–98*. Canberra: Australian Bureau of Statistics, 2000.
75. Cunningham J, Paradies Y. *Mortality of Aboriginal and Torres Strait Islander Australians, 1997*. Canberra: Australian Bureau of Statistics, 2000. Cat. No. 3315.0.
76. Fisher D, Murray J, Cleary M, Brewerton R. The Aboriginal and Torres Strait Islander casemix study. *The Medical Journal of Australia*. 1998;169:s11–s16.
77. Ruben A, Fisher D. The casemix system of hospital funding can further disadvantage Aboriginal children. *Medical Journal of Australia*. 1998;169 (s6–s10).
78. South Australian Health Commission. *Casemix Funding for Health-Hospitals*. Adelaide: South Australian Health Commission, 1998.
79. Commonwealth Department of Health and Ageing, Welfare AIoHa. *National Health Priority Areas Report: Diabetes Mellitus 1998—Summary*. Canberra: Commonwealth Department of Health and Ageing, Australian Institute of Health and Welfare, 1999. Cat. No. PHE13.
80. Boyles S. Alcohol lowers diabetes risk in women. *Web MD Health*. Available at: [http://my.webmd.com/content/article/16/1689\\_52795.htm](http://my.webmd.com/content/article/16/1689_52795.htm). Accessed 2/4/2003.
81. Wei M, Gibbons L, Mitchell T, Kampert J, Blair S. Alcohol intake and incidence of Type 2 diabetes in men. *Diabetes Care*. January 1, 2000;23(1):18–1431.

82. Holbrook T, Barrett-Connor E, Wingard D. A prospective population—based study of alcohol use and non-insulin- dependent diabetes mellitus. *Am. J. Epidemiol.* November 1, 1990;132(5):902–909.
83. Tsumura K, Hayashi T, Suematsu C, Endo G, Fujii S, Okada K. Daily alcohol consumption and the risk of Type 2 diabetes in Japanese men: The Osaka Health Survey. *Diabetes Care.* September 1, 1999;22(9):1432–1431.
84. Ogborne AC. Identifying and treating patients with alcohol-related problems. *CMAJ.* June 13, 2000;162(12):1705–1708.
85. Kao WHL, Puddey IB, Boland LL, Watson RL, Brancati FL. Alcohol consumption and the risk of Type 2 diabetes mellitus: Atherosclerosis risk in communities study. *Am. J. Epidemiol.* October 15, 2001;154(8):748–909.
86. Neel J. Diabetes mellitus: a thrifty genotype rendered detrimental by ‘progress’? *American Journal of Human Genetics.* 1962;14:353–362.
87. O’Dea K, Spargo RM, Akerman K. The effect of transition from traditional to urban life-style on the insulin secretory response in Australian Aborigines. *Diabetes Care.* 1980;3(1):31–37.
88. O’Dea K, Spargo RM, Akerman K. Some studies on the relationship between urban living and diabetes in a group of Australian Aborigines. *Med Anthropol.* 1980;4(1):1–20.
89. O’Dea K, Spargo RM. Metabolic adaptation to a low carbohydrate-high protein (‘traditional’) diet in Australian Aborigines. *Diabetologia.* 1982;23(6):494–498.
90. O’Dea K. The relationship between urbanisation and diabetes in Australian Aborigines. *Proc Nutr Soc Aust.* 1982;7:30–36.
91. O’Dea K, Spargo RM, Nestel PJ. Impact of westernization on carbohydrate and lipid metabolism in Australian Aborigines. *Diabetologia.* 1982;22:148–153.
92. O’Dea K. Lifestyle change and diabetes in Australian Aborigines. *Aboriginal Health Proj Inf Bull.* 1983;4:17–21.
93. O’Dea K. Marked improvement in carbohydrate and lipid metabolism in diabetic Australian Aborigines after temporary reversion to traditional lifestyle. *Diabetes.* 1984;33:596–603.
94. O’Dea K, White N, Sinclair A. An investigation of nutrition-related risk factors in an isolated Aboriginal community in Northern Australia: advantages of a traditionally-orientated life-style. *Medical Journal of Australia.* 1988;148:177–180.
95. O’Dea K. Westernization and non-insulin-dependent diabetes in Australian Aborigines. *Ethnicity & Disease.* 1991;1(2):171–187.
96. O’Dea K. Traditional diet and food preferences of Australian Aboriginal hunter-gatherers. *Philosophical Transactions of the Royal Society of London. B.* 1991;334(1270):233–241.
97. O’Dea K. Diabetes in Australian Aborigines: impact of the western diet and lifestyle. *Journal of Internal Medicine.* 1992;232(103–107).
98. O’Dea K. The therapeutic and preventative potential of the hunter-gatherer lifestyle: insights from Australian Aborigines. In: Temple NJ, Burkitt DP, eds. *Western Diseases: Their Dietary Prevention and Reversibility.* New Jersey: Humana Press, 1994:349–380.
99. O’Dea K, Busfield F. A genomewide search for Type 2 diabetes—susceptibility genes in Indigenous Australians. *Papua New Guinea Medical Journal.* 2001;44(3–4):164–170.

100. O'Dea K, Green E, Rowley K, Piers S, McDermott R. Is the 'healthy body mass index' range lower in Australian Aborigines than in Europeans? (Abstract). *Int J Obes Relat Metab Disord*. 1998;22:(Suppl. 3):S192.
101. Gault A, O'Dea K, Rowley KG, Mcleay T, Traianedes K. Abnormal glucose tolerance and other coronary heart disease risk factors in an isolated Aboriginal community in central Australia. *Diabetes Care*. 1996;19(11):1269–1273.
102. Australian Institute of Health and Welfare. *Aboriginal and Torres Strait Islander Health Series No. 3. Overview of Aboriginal Health Status in South Australia*. Available at: <http://www.austlii.edu.au/au/special/rsiproject/rsjlibrary/aih/sa/index.html>. Accessed 4/2003.
103. Phillips CB, Patel MS, Weeramanthri TS. High mortality from renal disease and infection in Aboriginal central Australians with diabetes. *Australian Journal of Public Health*. 1995;19(5):482–486.
104. Thomson N, Paterson B. *Eye Health of Aboriginal and Torres Strait Islander People*. Aboriginal and Torres Strait Islander Health Reviews. June 1998;1.
105. Pounder D. Dead sober or dead drunk? *British Medical Journal*. 1998;316:87.
106. Alexander W, Wills P, Eldred N. Urinary ethanol and diabetes mellitus. *Diabetic Medicine*. 1988;5:463–464.
107. Australian Diabetes Educators Association. *Draft Guidelines for Management and Care of Diabetes in the Elderly*. Australian Diabetes Educators Association. Available at: <http://www.adea.com.au/publicat/>. Accessed 9/4/2003.
108. Holmwood C, Phillips P. Current approaches to diabetes control: How good are they? *Australian Family Physician*. 2001;30(12):1129–1133.
109. Pomerleau J, McKeigue P, Chaturvedi N. Relationships of fasting and postload glucose levels to sex and alcohol consumption. Are American Diabetes Association criteria biased against detection of diabetes in women? *Diabetes Care*. March 1, 1999 1999;22(3):430–431.
110. Becker K, Walton-Moss B. Detecting and addressing alcohol abuse in women. *The Nurse Practitioner*. 2001;26(10):pp 13–16, 19–23.
111. Colagiuri S, Zimmet P, Hepburn A, Holt P, Colagiuri R. *Evidence Based Guideline for Type 2 Diabetes: Case Detection and Diagnosis*. Canberra: Diabetes Australia & NHMRC, 2002.
112. Carey K, Teitelbaum L. Goals and methods of alcohol assessment. *Professional Psychology: Research and Practice*. 1996;27(5):460–466.
113. St Vincents Declaration Primary Care Diabetes Group. Practical guide for management of Type 2 diabetes in primary care. *Diabetes for Professionals*. Available at: <http://www.d4pro.com/>. Accessed 2003.
114. New South Wales Health. *The Principles of Diabetes Care and Guidelines for the Clinical Management of Diabetes Mellitus in Adults*. North Sydney: NSW Health Department; 1996. PHD 96–0202.
115. Ewing J. Detecting alcoholism: The CAGE questionnaire. *JAMA*. 1984;252:1905–1907.
116. Russell A, Bigler L. Screening for alcohol related problems in an outpatient obstetric-gynaecologic clinic. *American Journal of Obstetrics and Gynaecology*. 1979;134:4–12.
117. Russell M, Martier S, Sokol R, Mudar P, Jacobson S, Jacobson J. Detecting risk drinking during pregnancy: a comparison of four screening questionnaires. *American Journal of Public Health*. 1996;86(10):1435 – 1439.

118. Selzer M. The Michigan Alcoholism Screening Test: The quest for a new diagnostic instrument. *American Journal of Psychiatry*. 1971;127:1653–1658.
119. Saunders J, Aasland O, Babor T, de la Fuente J, Grant M. Development of the alcohol use disorders identification test (AUDIT). WHO collaborative project on early detection of persons with harmful alcohol consumption. *Addiction*. 1993;88:791–804.
120. Bradley K, Boyd-Wickizer J, Powel S, et al. Alcohol screening questionnaires in women: A critical review. *JAMA*. 1998;280:166–171.
121. Shand F, Gates J, Fawcett J, Mattick R. *The Treatment of Alcohol Problems: A Review of the Evidence*. Canberra: Department of Health and Ageing & National Drug and Alcohol Research Centre, 2003.
122. Dawe S, Loxton N, Hides L, Kavanagh D, Mattick R. *Review of Diagnostic Screening Instruments for Alcohol and Other Drug Use and Psychiatric Disorders*. 2nd Edn. Canberra: Commonwealth of Australia, 2002. 3146 monograph No.48.
123. Stockwell T, Sitharthan T, McGrath D, Lang E. The measurement of alcohol dependence and impaired control in community samples. *Addiction*. 1994;89:167–174.
124. Bridge E. Fighting the silent killer. *Yarranma*. Vol. 16, 2003:14–16.
125. Effective Healthcare Australia UoS, Australian Centre for Diabetes Strategies PoWH, Sydney. A plan for the dissemination and implementation of national evidence based guidelines for the prevention and management of Type 2 Diabetes. *Diabetes Australia*. Available at: <http://www.diabetesaustralia.com.au/docs/Dissemination-Plan.PDF>. Accessed 2003.
126. Eastman R, Keen H. The impact of cardiovascular disease on people with diabetes: The potential for prevention. *Lancet*. 1997;350:29–32.
127. Jarrett R. Epidemiology and public health aspects of non insulin dependent diabetes mellitus. *Epidemiologic Reviews*. 1989;11:151–171.
128. American Diabetes Association. Standards of medical care for patients with Diabetes Mellitus. *Diabetes Care*. 2003;26:S33–S50.
129. Couzos S, Metcalf S, Murray R, O'Rourke S. *Recommendations for Clinical Care Guidelines on the Management of Non-Insulin-Dependent Diabetes in Aboriginal and Torres Strait Islander Populations*. Canberra: Office for Aboriginal and Torres Strait Islander Health Services, Commonwealth Department of Health and Family Services, September 1997–1998.
130. Knuiman MW, Welborn TA, McCann VJ, Stanton KG, Constable IJ. Prevalence of diabetic complications in relation to risk factors. *Diabetes*. 1986;35:1332–1339.
131. Phillips C, Patel M, Weeramanthri T, Powers J. Infections and the new epidemic of diabetes: Mortality among Aboriginal central Australians (abstract). *Tropical Medicine at the Top End*. Australasian College of Tropical Medicine; 1993.
132. Phillipov G, Alimat A, Phillips P, Drew A. Screening for diabetic retinopathy. *Medical Journal of Australia*. 1995;162:518–520.
133. Higgin K, Cooper-Stanbury M, Williams P. *Statistics on Drug Use in Australia*. Canberra: Australian Institute of Health and Welfare, 2000.
134. Blume S. Women: Clinical Aspects. In: Lowinson JH RP, Millman RB, et al., eds, ed. *Substance Abuse: A Comprehensive Textbook*. Baltimore Md.: Williams & Wilkins, 1997:645–654.

135. Australian Bureau of Statistics. *Australia Now— A Statistical Profile. Population— Indigenous Population*. Canberra: Australian Bureau of Statistics, 1999c.
136. Heale P, Stockwell T, Dietze P, Chikritzhs T, Catalano P. *Patterns of Alcohol Consumption in Australia, 1998*. Canberra: National Alcohol Indicators Bulletin No. 3., 2000.
137. World Health Organization. *International Guide for Monitoring Alcohol Consumption and Related Harm*. Geneva: Department of Mental Health and Substance Dependence, Noncommunicable Diseases and Mental Health Cluster, World Health Organization, 2000.
138. Stockwell T, Heale P, Chikritzhs T, Dietze P, Catalano P. How much alcohol is drunk in Australia in excess of the new Australian alcohol guidelines? *Medical Journal of Australia*. 2002;176:91–92.
139. Hunter E, Fagan P. White dreaming: stereotypes of Aboriginal people in medical practice. *Aboriginal and Torres Strait Islander Health Information Bulletin*. 1994;19:17–24.
140. Cawte J. The devil's dozen: 13 Aboriginal depressions. *Aboriginal Health Worker*. 1988;12(2):19–29.
141. Siggers S, Gray D. Aboriginal Health and Society. *The Traditional and Contemporary Aboriginal Struggle for Better Health*. Allen & Unwin, 1991.
142. de Crespigny C, Groenkjaer M, Casey W, Murray H, Parfoot W. *Breaking Down the Barriers. Urban Aboriginal Women, Drinking and Licensed Premises in the Southern Metropolitan Region of South Australia*. School of Nursing & Midwifery, Flinders University and Aboriginal Drug and Alcohol Council (SA) Inc., 2002.
143. de Crespigny C. *Better Medication Management for Aboriginal People with Mental Health Disorders and their Carers—A Pilot Study in Northern Metropolitan Adelaide*. Bedford Park, South Australia: Inprint Design, 2002.
144. Gray D, Siggers S, Sputore B, Bourbon D. What works? A review of evaluated alcohol misuse interventions among Aboriginal Australians. *Addiction*. 2000;95(1):11–22.
145. Ellis R. Models of Excellence in Indigenous Community Health. *Aboriginal and Islander Health Worker Journal*. 1996;20(5):6–15.
146. Gray D, Siggers S, Atkinson D, Sputore B, Bourbon D. Beating the grog: An evaluation of the Tennant Creek liquor licensing restrictions. *Australian and New Zealand Journal of Public Health*. 2000;24:39–44.
147. Gray D. Indigenous Australians and liquor licensing restrictions. *Addiction*. 2000;95:1469–1472.
148. Gray D, Chikritzhs T. Regional variation in alcohol consumption in the Northern Territory. *Australian and New Zealand Journal of Public Health*. 2000;24(1):35–38.
149. Brady M. Aboriginal drug and alcohol use: Recent developments and trends. *Australian and New Zealand Journal of Public Health*. 1997;21(1):3–4.
150. Bulteau P. Its up to hospitals: employ Aboriginal health workers! *Aboriginal Health Worker Journal*. 1978;2(1):49–51.
151. Sibthorpe B, Bailie R, Brady M, Ball S, Sumner-Dodd P, Hall W. The demise of a planned randomised controlled trial in an urban Aboriginal medical service. (see comments). *Medical Journal of Australia*. March 2002 18;176(6):273–6. 2002.
152. Pies R. *When Alcohol Becomes a Problem*. Web MD Health. Available at: <http://my.webmd.com/contnet/article/14/1674-50182.htm>. Accessed 2/4/2003.

153. Joffe B, Shires R, Lamprey J, Baker S, Seftel H. Effect of drinking bottled beer on plasma insulin and glucose responses in normal subjects. *South African Medical Journal*. 1982;62:95–97.
154. Grayson C. *Can Diabetics Drink Alcohol?* Web MD Health. Available at: [http://my.webmd.com/content/article/46/1667\\_50921.htm](http://my.webmd.com/content/article/46/1667_50921.htm). Accessed 2/4/2003.
155. Valmadrid C, Klein R, Moss S, Klein B, Cruickshanks K. Alcohol intake and the risk of coronary heart disease mortality in persons with older-onset diabetes mellitus. *JAMA*. 1999;282:239–246.
156. Kiechl S, Willeit J, Rungger G, et al. Alcohol consumption and atherosclerosis: what is the relation? Prospective results from the Bruneck Study. *Stroke*. 1998;29:900–907.
157. Weintraub W. Alcohol consumption, diabetes and coronary disease: An epidemiological perspective. *Circulation*. 2000;102(5):489–490.
158. Cooper DE, Goff DC, Jr., Bell RA, Zaccaro D, Mayer-Davis EJ, Karter AJ. *Is Insulin Sensitivity a Causal Intermediate in the Relationship Between Alcohol Consumption and Carotid Atherosclerosis?*: The Insulin Resistance and Atherosclerosis Study Diabetes Care. August 1, 2002;25(8):1425–1431.
159. Rimm E, Chan J, Stampfer M, Colditz G, Willett W. Prospective study of cigarette smoking, alcohol use and the risk of diabetes in men. *British Medical Journal*. 1995;310(6979):555–559.
160. Wannamethee SG, Shaper AG, Perry IJ, Alberti KGMM. Alcohol consumption and the incidence of type II diabetes. *J Epidemiol Community Health*. July 1, 2002;56(7):542–548.
161. Kiechl S, Willeit J, Poewe W, et al. Insulin sensitivity and regular alcohol consumption: Large prospective, cross sectional population study (Bruneck study). *British Medical Journal*. 1996;313(7064):1040–1044.
162. Ajani UA, Hennekens CH, Spelsberg A, Manson JE. Alcohol Consumption and Risk of Type 2 Diabetes Mellitus Among US Male Physicians. *Arch Intern Med*. April 10, 2000;160(7):1025–1247.
163. Ajani U, Gaziano M, Lotufo P, et al. Alcohol consumption and risk of coronary heart disease by diabetes status. *Circulation*. 2001;102:500–505.
164. Bell R, Mayer-Davis E, Martin M, D'Agostino R, Haffner S. Associations between alcohol consumption and insulin sensitivity and cardiovascular disease risk factors: the Insulin Resistance and Atherosclerosis Study. *Diabetes Care*. November 1, 2000;23(11):1630–1431.
165. Conigrave KM, Hu BF, Camargo CA, Stampfer MJ, Willett WC, Rimm EB. A Prospective Study of Drinking Patterns in Relation to Risk of Type 2 Diabetes Among Men. *Diabetes*. October 1, 2001;50(10):2390–1431.
166. Dekker J, de Vegt F, van Groenvelde W, et al. Alcohol consumption and mortality risk in categories of glucose tolerance. The Hoorn study. *American Diabetes Association*. Available at: [http://www.findarticles.com/cf\\_dls/m0922/5\\_49/62891977/print.jhtml](http://www.findarticles.com/cf_dls/m0922/5_49/62891977/print.jhtml). Accessed 4/2/03.
167. Wakabayashi I, Kobaba-Wakabayashi R, Masuda H. *Relation of Drinking Alcohol to Atherosclerotic Risk in Type 2 Diabetes* Diabetes Care. July 1, 2002;25(7):1223–1431.

168. Ferber D. *Men Who Drink Moderately Have a Lower Risk of Diabetes*. Web MD Health. Available at: [http://my.webmd.com/content/article/21/1728\\_54048.htm](http://my.webmd.com/content/article/21/1728_54048.htm). Accessed 2/4/2003.
169. Stampfer M, Colditz G, Willett W, et al. A prospective study of moderate alcohol drinking and risk of diabetes in women. *Am. J. Epidemiol.* September 1, 1988;128(3):549–909.
170. Solomon C, hu F, Stampfer M, Colditz G, al e. Moderate alcohol consumption and risk of coronary heart disease among women with Type 2 diabetes mellitus. *Circulation.* 2000;102(5):494–450.
171. Nakanishi N, Suzuki K, Tatara K. Alcohol consumption and risk for development of impaired fasting glucose or Type 2 diabetes in middle-aged Japanese men. *Diabetes Care.* January 1, 2003;26(1):48–1431.
172. Launer L, Feskens E, Kalmijn S, Kromhout D. Smoking, drinking, and thinking. The Zutphen Elderly Study. *Am. J. Epidemiol.* February 1, 1996;143(3):219–909.
173. Thomson A, Rajotte R. Effect of dietary modification on the uptake of glucose, fatty acids, and alcohols in diabetic rats. *Am J Clin Nutr.* September 1, 1983;38(3):394–866.
174. Koivisto V, Tulokas S, Toivonen M, Haapa E, Pelkonen R. Alcohol with a meal has no adverse effects on postprandial glucose homeostasis in diabetic patients. *Diabetes Care.* December 1, 1993;16(12):1612–1431.
175. Jose Gerard M, Klatsky A, Siegelau A, Friedman G, Feldman R. Serum glucose levels and alcohol-consumption habits in a large population. *Diabetes.* August 1, 1977;26(8):780–785.
176. Turner BC, Jenkins E, Kerr D, Sherwin RS, Cavan DA. The effect of evening alcohol consumption on next-morning glucose control in Type 1 diabetes. *Diabetes Care.* November 1, 2001;24(11):1888–1431.
177. Feingold K, Siperstein M. Normalisation of fasting blood glucose levels in insulin requiring diabetes: the role of ethanol abstention. *Diabetes Care.* 1983;6:186–188.
178. Ben G, Gnidi L, Maran A, et al. Effects of chronic alcohol intake on carbohydrate and lipid metabolism in subjects with Type 2 (non insulin dependent) diabetes. *American Journal of Medicine.* 1991;90:70–76.
179. Arky R, Veverbrants E, Abramson E. Irreversible hypoglycemia: A complication of alcohol and insulin. *JAMA.* 1968;206: 575–578.
180. Arky R. Hypoglycemia associated with liver disease and ethanol. *Endocrinol Metab Clin North Am.* 1989;18:75–90.
181. Avogaro A, Fontana P, Valerio A, et al. Alcohol impairs insulin sensitivity in normal subjects. *Diabetes Research.* 1987;5:23–27.
182. Avogaro A, Beltramello P, Gnudi L, et al. Alcohol intake impairs glucose counter-regulation during acute insulin-induced hypoglycemia in IDDM patients. Evidence for a critical role of free fatty acids. *Diabetes.* November 1, 1993;42(11):1626–1431.
183. Tessari P, Bruttomesso D, Pianta A, et al. Effects of wine intake on postprandial plasma amino acid and protein kinetics in Type 1 diabetes. *Am J Clin Nutr.* May 1, 2002;75(5):856–866.

184. Facchini F, Chen Y, Reaven G. Light-to-moderate alcohol intake is associated with enhanced insulin sensitivity. *Diabetes Care*. February 1, 1994;17(2): 115–1431.
185. Zilkens RR, Burke V, Watts G, Beilin LJ, Puddey IB. The effect of alcohol intake on insulin sensitivity in men: A randomized controlled trial. *Diabetes Care*. March 1, 2003;26(3):608–1431.
186. Keilman P. Alcohol consumption and diabetes mellitus mortality in different countries. *Am J Public Health*. November 1, 1983 1983;73(11):1316–1317.
187. Spraul M CE, Scherbach A-M, Berger M. Glycemic effects of beer in IDDM patients. *Diabetes Care*. 1988;11:659–661.
188. Yki-Jarvinen H, Koivisto V, Ylikahvi R, Taskinen M-R. Acute effects of ethanol and acetate on glucose kinetics in normal subjects. *American Journal of Physiology*. 1988;254:E175–E180.
189. Yki-Jarvinen H, EA: N. Ethanol decreases glucose utilization in healthy man. *J Clin Endocrinol Metab*. 1985;61:941–945.
190. Plant M, Single E, Stockwell T. Introduction: Harm minimisation and alcohol. In: Plant M, E S, Stockwell T, eds. *Alcohol: Minimising the Harm*. London: Free Association Books, 1997.
191. Tai Y, Saunders J, Celermajor D. Collateral damage from alcohol abuse: The enormous cost to Australia. *Medical Journal of Australia*. 1998;168:6–7.
192. Ministerial Council on Drug Strategy. *Alcohol in Australia: Issues and Strategies*. Canberra: Commonwealth of Australia, 2001.
193. Bradey M. Culture in treatment. Culture as treatment. A critical appraisal of developments in addictions programs for Indigenous North Americans and Australians. *Social Science Medicine*. 1995;41(11):1487–1498.
194. Harding-Burns F, Sullivan D. Case study: Intervention in alcohol abuse in Aboriginals—The viewpoint of the uninitiated. *Australian Alcohol and Drug Review*. 1983;2(2):121–122.
195. King M, Wilson K. Aboriginal projects undertaken in South Australia. *Aboriginal Islander Health Work Journal*. 1998;22(6):24–27.
196. Sago P, Health CDoCSa. Training Aboriginal health workers in the process of developing health education materials for alcohol and drug abuse prevention campaigns. In: Sago P, ed. *Technical Information Bulletin on Drug Abuse No. 79: Drug Issues Affecting Aboriginal Australians*. Canberra: Australian Government Publishing Service; 1988.
197. Davis PG. Aboriginal health problems in country prisons. *Aboriginal Health Work*. 1987;11(4):12–16.
198. McCulloch B, McDermott R, Miller G, Leonard D, Elwell M, Muller R. Self-reported diabetes and health behaviours in remote Indigenous communities in Northern Queensland, Australia. *Diabetes Care*. February 1, 2003;26(2):397–1431.
199. Brady M. *Giving Away the Grog: Aboriginal Accounts of Drinking and Not Drinking*. Canberra: Australian Government Publishing Service, 1995.
200. Brady W, Stein I, King M. The teaching and learning principles of metropolitan Aborigines with diabetes. *Journal of Advanced Nursing*. 1999;29(1):97–103.

201. Dwyer P. Aboriginal health workers and the TAFE drug and alcohol training course. *Aboriginal Health Worker Journal*. 1989;13(2):28–31.
202. Prasad R. *Diabetes Project: Taking the Service to the People, Improving Continuity of Care for People With Diabetes in the Riverland*. Berri, South Australia: Riverland Regional Health Service Inc., 2002.