

# Endocrine Health Network

## Diabetes Model of Care

Prepared by the  
Endocrine Health Network  
Working Party  
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WA Health Networks  
Working Together to Create a Healthy WA





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## METHODOLOGY

Guided by recommendations contained in *An Overview of the Model of Care* (DOH 2007), the Clinical Lead of the Endocrine Health Network, Dr David Hurley, commenced formative work on a Diabetes Model of Care in April 2007. This was informed by the following key documents:

- Western Australian Diabetes Strategy 1999
- National Service Improvement Framework for Diabetes (2005)
- WA Metropolitan Clinical Services Masterplan: Endocrinology Services Working Group Report 2006
- Diabetes Australia: National Priorities for Turning Around the Diabetes Epidemic 2007-2008
- Forum Report: Endocrine Health Network Stakeholders Forum 2006

Further development and refinement of the model occurred through ongoing input from members of the Endocrine Health Network Executive Advisory Group and their stakeholder contacts. Additional consultation on the draft document was formally invited through the Office of Aboriginal Health and all stakeholders registered on the Endocrine Health Network database.

The Endocrine Health Network Executive Advisory Group endorsed the final draft of the model of care prior to submission to the State Health Executive Forum through the Executive Director, Health Policy and Clinical Reform.



## 1. EXECUTIVE SUMMARY

Diabetes is the sixth leading cause of death in Australia (NHPAC 2005) and is the world's fastest growing disease (Diabetes Australia 2007). Diabetes is one of Western Australia's most significant health issues. The Endocrine Health Network selected Diabetes as a priority area for the development of a Model of Care. The Diabetes Model of Care provides a framework for comprehensive, accessible and efficient provision of coordinated diabetes prevention and management services for all Western Australians.

### CURRENT SITUATION

Most patients with type 2 diabetes are managed in the community by general practitioners, with variable input from allied health professionals. Those with type 1 diabetes require long term care by a specialist multidisciplinary team with specific skills in managing all aspects of type 1 diabetes and its complications.

#### What are the gaps?

As type 2 diabetes and its complications are largely preventable, the escalating health and financial costs of the diabetes epidemic demand much greater investment in **diabetes awareness and prevention**.

**Systematic management** which targets smoking cessation and control of blood glucose, blood pressure and lipids is highly effective in preventing and slowing the macrovascular and microvascular complications of both type 2 and type 1 diabetes. However, current diabetes care does not always meet the needs of adults and children across WA, and there can be wide variations in care delivery and outcomes. **Lack of coordination** of the large number of organisations and individuals providing community based diabetes services has been repeatedly identified as a major impediment to optimal management.

Healthcare professionals alone cannot manage diabetes; the challenge is to provide the environment in which diabetes can be jointly managed, promoting self-care and empowerment. Self-management is truly at the heart of living with diabetes. The challenge for health and community services across WA is to provide help and support to enable people with diabetes to do this well.

Despite the focus on self-management, however, some will develop problems requiring ambulatory or inpatient specialist care. **Partnerships** between patients and clinicians and between primary and secondary care are critical to supporting people with diabetes. **Lack of communication** between service providers causes inefficiency, duplication of services, errors and reduced quality of care. There is **very little electronic communication** in either direction between general practice and public hospitals, outpatient clinics,



private specialists or allied health. Many emergency department attendances and hospital admissions can be prevented if people with diabetes and their health care providers have the **knowledge** and support to manage diabetes during metabolic upsets and acute illness without hospital admission.

## MODEL OF CARE FOR DIABETES

The key objective of the Diabetes Model of Care is to ensure that diabetes services are optimally configured to:

- Prevent and delay the onset of diabetes;
- Prevent and slow progression of diabetic complications, especially heart disease, renal failure, impaired vision and lower limb amputations;
- Improve the quality of life of people who have diabetes; and
- *Reduce inequities in diabetes service provision, particularly for Aboriginal people and other disadvantaged groups.*

Implementation of the Diabetes Model of Care will assist service delivery and integration of diabetes services across WA in the following ways:

- **Increasing the capacity** of GP-coordinated multidisciplinary services to prevent and manage diabetes and its complications;
- Developing an **efficient interface** between general practice and the diversity of community-based diabetes prevention and management services at the local level, especially in under-resourced and high need locations;
- **Improving accessibility** and quality of diabetes self-management education;
- **Enhancing service quality** by increasing the use of guidelines, local protocols, service directories, registers, recall systems and patient-held management plans to ensure that all people with diabetes receive comprehensive, ongoing care;
- **Improving local service coordination** and increasing knowledge of available resources by health care providers and people with diabetes;
- **Improving access to and effectiveness of specialist services** to address specific problems and refer back to general practice for long-term management.



The Diabetes Model of Care addresses the following stages of diabetes prevention and management:

- Community awareness and prevention
- Prevention and early diagnosis in high- risk groups
- Optimal initial and long term management
- Early detection and optimal management of complications
- Coordinated prevention and management of acute episodes

The Model of Care for each stage of diabetes consists of the following components:

- Health promotion
- GP-coordinated multidisciplinary prevention and management, including targeted programs for high risk and vulnerable groups
- Specialist team services

#### **KEY PRIORITIES FOR IMPLEMENTATION OF THE DIABETES MODEL OF CARE**

- Enhance community-wide and targeted promotion of healthy environment and lifestyle to prevent diabetes and increase awareness of the health impact of diabetes and its complications.
- Improve coordination of community based diabetes prevention and management services, including patient self-management.
- Reconfigure specialist services for optimal effectiveness.
- Ensure ready access to guidelines, protocols, decision aids and service directories for diabetes service providers and consumers.
- Develop systems of information and communication technology support to improve communication and data sharing between GP's and other service providers, improve service quality and to monitor services and outcomes.
- Increase investment in workforce training and development.
- Ensure ready availability of new technology for diabetes.
- Foster and support basic and clinical research in diabetes.

While the model is intended for application throughout Western Australia, implementation will require flexible, networked solutions at the local level. Innovative strategies are needed to overcome the challenges posed by service gaps, remote locations, cultural factors, language and the special needs of Aboriginal people and other high risk and vulnerable groups who suffer disproportionately high rates of morbidity and mortality from diabetes, and who account for a substantial proportion of hospital admissions.



## 2. WHAT IS DIABETES?

People with diabetes mellitus have high levels of glucose in their blood because of a lack of insulin or resistance to the effects of insulin.

**Type 1 diabetes** In type 1 diabetes, beta cells in the pancreas that make insulin are destroyed by the immune system, causing severe, usually complete deficiency of insulin. This form of diabetes is more common in childhood and young adulthood but can occur at any age. People with type 1 diabetes must receive daily insulin injections to sustain life, and must do regular fingerprick blood glucose tests to monitor their diabetes. Progressive improvements in management and introduction of new technology have resulted in reduced rates of complications and greatly improved life expectancy.

**Type 2 diabetes** People with type 2 diabetes are resistant to the action of insulin and also have relative insulin deficiency because of progressive failure of the pancreatic beta cells.

An inherited susceptibility to Type 2 diabetes is aggravated by abdominal obesity. Type 2 diabetes usually occurs in middle aged and elderly people, but is becoming more common in younger adults, adolescents and children, particularly in Aboriginal populations.

Type 2 diabetes and diabetic complications are often asymptomatic, making early diagnosis difficult. In Aboriginal and other high risk, remote and under-resourced groups, diabetes is often undiagnosed until advanced complications have developed.

Optimal management requires early detection and sustained weight loss through diet and exercise. Many people also need medication to control glucose levels and to lower blood pressure and cholesterol. Cessation of smoking is essential to reduce the risk of vascular disease.

**Diabetic complications** In both types of diabetes, persistently elevated blood glucose levels cause damage to small blood vessels in the retina and kidney. Elevated blood glucose concentrations interact with high blood pressure and altered blood lipids to cause accelerated atherosclerosis in arteries in the heart, legs and brain.

**Gestational diabetes** In women predisposed by genetic factors and abdominal obesity, hormonal changes during pregnancy increase blood glucose levels, resulting in increased rates of congenital abnormalities, foetal weight gain and perinatal complications. Gestational diabetes is usually asymptomatic, and is detected by screening tests. Treatment consists of dietary modification and, in some cases, insulin injections. Up to 50% of women who have had gestational diabetes subsequently develop type 2 diabetes.



### 3. DIABETES IN WA: EPIDEMIOLOGY AND HEALTH IMPACT

#### Burden of disease

Diabetes is the sixth leading cause of death in Australia (NHPAC 2005) and is the world's fastest growing disease (Diabetes Australia 2007). The personal, social and economic costs of the diabetes epidemic are substantial. At a national level, government health budgets are impacted to the extent of an estimated \$6 billion per annum (Diabetes Australia 2007). It is estimated that the number of people with diabetes in Australia will double by 2010, making the prevention of diabetes a national priority (International Diabetes Federation and International Association for the Study of Obesity 2004).

Diabetes (diabetes mellitus) is one of Western Australia's most significant health issues. Each day, approximately 30 people are diagnosed with diabetes in WA (Barr et al 2005). Type 2 diabetes is the most common form, comprising 85 to 90% of those with diabetes.

Results from the landmark *Australian Diabetes, Obesity and Lifestyle (AusDiab) Study*, released in 2000, indicated that 7.5% of Australian adults have diabetes and a further 16.3% have impaired glucose metabolism ('pre-diabetes'). From the AusDiab results, it is estimated that more than 120,000 Western Australians have diabetes (Dunstan et al 2001). In the 2006/07 WA Health and Wellbeing Surveillance System (HWSS) survey, 5.7% of those aged 16 years or more reported having diabetes. Many studies have shown that up to 50% of type 2 diabetes is undiagnosed.

Since 1996 the prevalence of type 2 diabetes has doubled (Diabetes Australia 2007).

WA and international data indicate that the incidence of type 1 diabetes is also increasing at approximately 3% per year (Haynes A, Bower C, Bulsara MK et al 2004; Taplin CE, Craig ME, Lloyd M et al 2005; International Diabetes Federation 2004).

The burden of diabetes is distributed unequally across society. In 2001-03, diabetes-related mortality in the most disadvantaged areas of Australia was 82% higher than in the least disadvantaged areas (AIHW 2005).

#### Prevalence, epidemiology of diabetes in WA

In the 2006-2007 WA HWSS survey, 5.7% of those aged 16 years or more reported having diabetes. From this figure, it is estimated that 90,759 WA adults had diabetes at that time. The Ausdiab results indicate that many adults have undiagnosed diabetes and suggest that diabetes is present in more than 120,000 Western Australian adults. The HWSS and AusDiab data show a marked age related increase in diabetes prevalence in both sexes, reaching 15-20% or more in older age groups (Tables 3 and 4).



**Table 1 Prevalence of reported diabetes**

by age group and sex, persons aged 16 years and older, HWSS Jan 2006 to June 2007

	Males	Females	Persons	Estimated Population	Number Interviewed
16 to 44 years	1.1	3.1	2.1	17634	3293
45 to 54 years	5.3	5.7	5.5	15655	1744
55 to 64 years	12.3	7.5	10.0	21188	1604
65 to 74 years	18.0	13.8	15.5	21737	1123
75 & over years	18.0	15.0	14.9	14545	810
<b>16 &amp; over years</b>	<b>5.5</b>	<b>5.9</b>	<b>5.7</b>	<b>90759</b>	<b>8574</b>

**Table 2 AusDiab age and gender**

specific prevalence of diabetes: Australia vs. WA

	35-44	45-54	55-64	65-74	75+
WA Males	3.7	5.3	15.8	13.4	25.0
WA Females	1.7	4.6	8.5	14.1	17.3
Aust Males	2.6	6.8	16.1	21.6	22.4
Aust Females	2.3	5.5	9.9	16.1	24.5

Survey population numbers: WA : N = 1561, Australia: N = 11,247

### Diabetes in Aboriginal people

The reported prevalence of diabetes is two to four times higher in Aboriginal people than in the non-Aboriginal population (NHPAC 2005). In some remote Aboriginal communities the prevalence of diabetes is as high as 30% (Diabetes Australia 2007). Type 2 diabetes often develops at a younger age, and is associated with a cluster of vascular risk factors such as abdominal obesity, dyslipidaemia and hypertension (WADS 1999). Many also have renal disease. Diabetes contributes substantially to the excessive mortality of Aboriginal people whose life expectancy is 17 years less than that of other Australians (NHPAC 2005). In WA, rates of death due to diabetes are 13 times higher for female and six times higher for male Aboriginal people than for non-Aboriginal people (Department of Health Western Australia 2002).

Diabetes causes high rates of cardiovascular disease, renal failure and vision loss in Aboriginal people.

### Overweight and obesity

The increasing prevalence of Type 2 diabetes is closely related to increasing levels of overweight and obesity in the community (Figure 1). In 2005 it was estimated that 3.24 million Australians were obese, including 280,000 young Australians (aged 5-19 years) (Access Economics 2006). There has been a 2-4

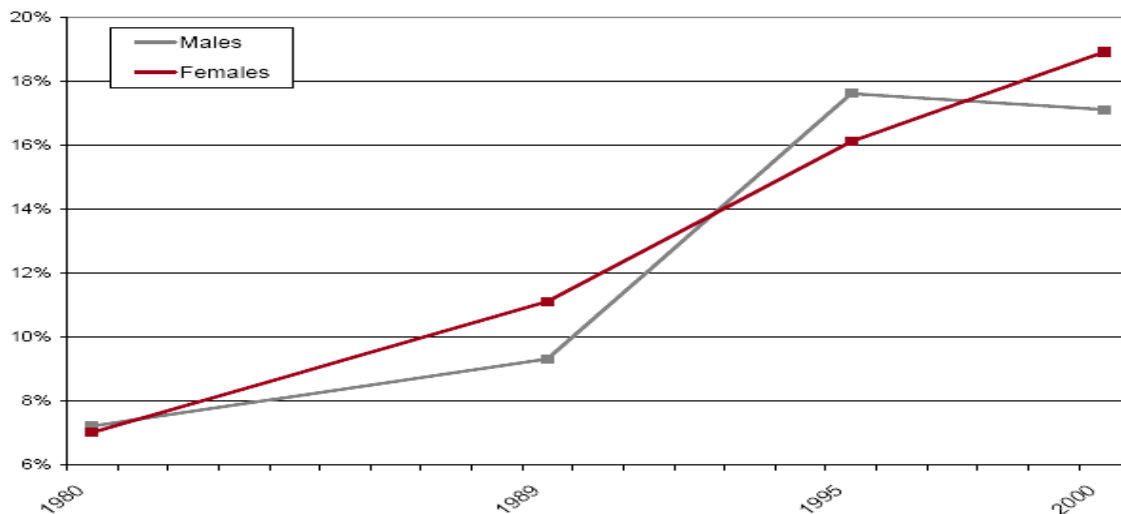


fold increase in the prevalence of obesity from 1985 to 1997 (Diabetes Australia 2007). Aboriginal Western Australians are 1.3 times more likely than non-Aboriginal Western Australians to be overweight or obese (ABS 2006).

Of particular concern are the increasing rates of overweight and obesity in children, which are associated with adolescent and childhood onset of type 2 diabetes as well as other chronic diseases, including cardiovascular disease, hypertension and arthritis.

Several studies have clearly shown that modest weight loss can prevent or delay Type 2 diabetes in high-risk individuals (Tuomilehto J, Lindstrom J, Eriksson JG et al 2001; Knowler WC, Barrett-Connor E, Fowler SE et al 2002).

**Figure 1 Trends in Obesity Prevalence (%) for Australian adults, 1980 to 2000**



Source: Access Economics 2006

### Complications of diabetes

Diabetes is acknowledged to be:

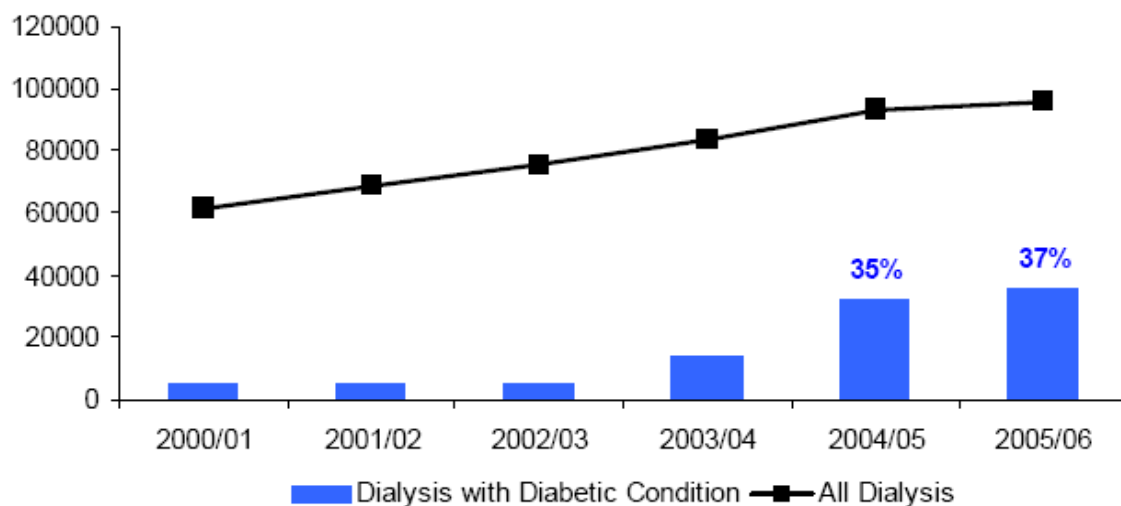
- A major cause of cardiovascular disease
- The most common reason for commencing renal dialysis
- The most common cause of blindness in people under the age of 60 years
- The most common cause of non-traumatic lower-limb amputation
- One of the most common chronic diseases in children (Barr et al 2005)



**Cardiovascular disease** Coronary artery disease is 2-3 times more prevalent in people with diabetes, and carries a worse prognosis (Laasko M 1999; Diabetes Atlas, IDF; Franklin K, Goldberg RJ, Spencer F et al 2004). Cardiovascular disease is the major cause of death for people with diabetes, accounting for 50% of all diabetes fatalities.

**Kidney disease** Diabetes-related kidney failure is the most common reason for commencing dialysis in Australia and Western Australia. Rates of end-stage renal failure are especially high in Aboriginal people. The proportion of dialysis patients with diabetes has increased rapidly over the last few years (Figure 2).

**Figure 2** Proportion of diabetic patients among dialysis episodes in WA



Source: Health Networks & WA Health Epidemiology Branch 2007

**Eye disease** Diabetic retinopathy is the most common cause of blindness in working age adults in Australia, and the leading cause of blindness in Aboriginal people. It is estimated that about 133,900 or 2.8% Australians aged 55 or more had diabetic retinopathy in 2004 (Australian Institute of Health and Welfare 2005a). The prevalence of retinopathy increases with duration of diabetes and with average blood glucose concentration, as indicated by HbA1c (Tapp RJ, Shaw JE, Harper CA et al. 2003).

**Lower limb amputations** Diabetes is present in at least 50% of the 500-600 Western Australians who undergo lower limb amputations each year.

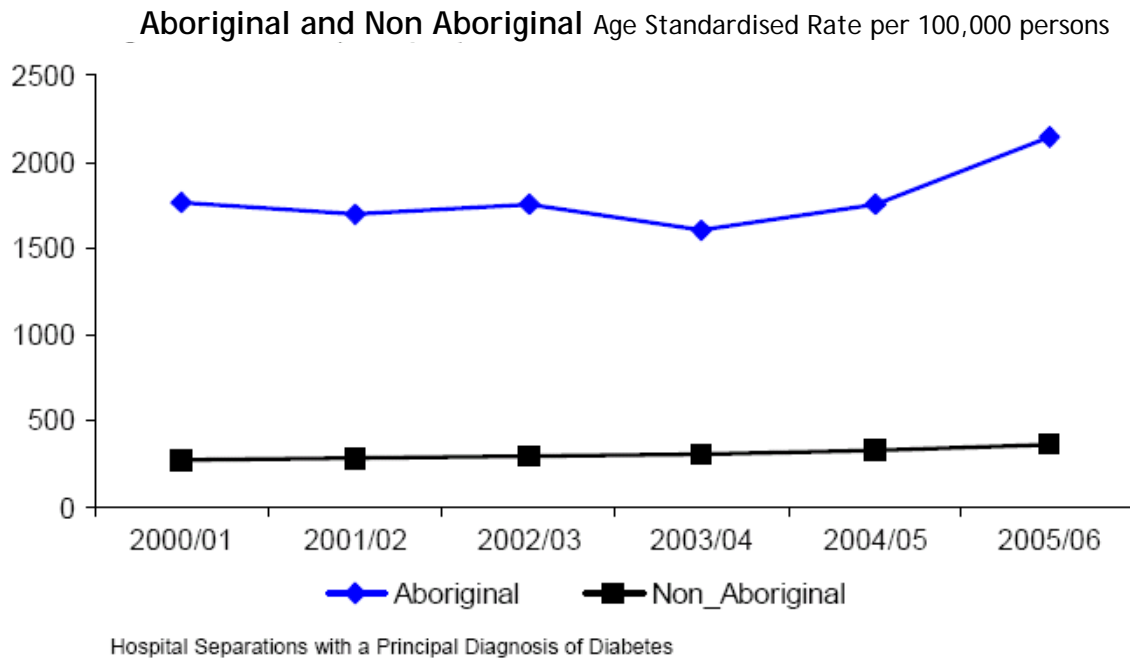


## Hospital admissions

Approximately 20% of people admitted to Australian tertiary hospitals and 50% of people admitted to coronary care units have diabetes (Bartnik M, Ryden L, Ferrari R et al 2004). People with diabetes have longer hospital stays and poorer outcomes (Umpierrez G, Isaacs S, Bzargan N et al 2002).

In Western Australia, the age-adjusted hospital admission rate for diabetes related problems is 17 times higher for Aboriginal females and 10 times higher for Aboriginal males compared to the non-Aboriginal population (Figure 3).

**Figure 3 Diabetes - WA Hospitalisation Rate**



Source: Health Networks & WA Health Epidemiology Branch 2007

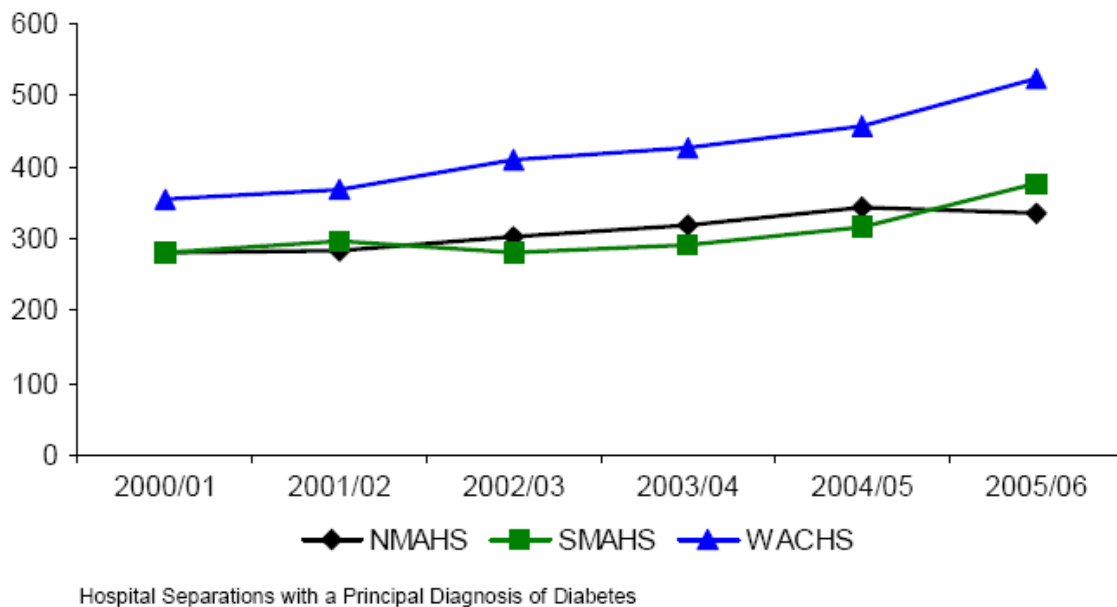


## Diabetes related hospitalisations - Metropolitan vs Country

Patients living in the Western Australian Country Health Services area have higher hospitalisation rates for diabetes than those living in the Perth Metropolitan Area. North and South Metropolitan Health Services have similar hospital admission rates (Figure 4).

**Figure 4 Diabetes - WA Hospitalisation Rate by Health Service Area**

Age Standardised Rate per 100,000 persons according to patients residential address



Source: Health Networks & WA Health Epidemiology Branch 2007



## 4. CURRENT WA DIABETES SERVICES AND SERVICE GAPS

### Type 2 diabetes

#### 1. Diabetes awareness, prevention and early diagnosis services

Type 2 diabetes and its complications are largely preventable. People with IGT/IFG or a history of gestational diabetes can reduce their risk of developing type 2 diabetes by up to 60% by healthy eating, moderate weight loss and regular physical activity (Tuomilehto et al 2001; Knowler et al 2002). A supportive environment that promotes a healthy lifestyle is imperative for reducing the risk of diabetes in the general community.

Type 2 diabetes and diabetic complications are often asymptomatic, making early diagnosis difficult. In Aboriginal and other vulnerable, high risk, remote and under-resourced groups, diabetes is often undiagnosed until advanced complications have developed.

Diabetes awareness and prevention services are provided by many organisations and individuals in the government, non-government and private sectors. Most have limited capacity and operate independently of each other and other diabetes services.

There is a pressing need for a coordinated community services sector that is integrated with general practice to provide health promotion, risk assessment, diabetes prevention services and early diagnosis of diabetes and self-management education at the local level. The fact that most Australian adults attend a general practitioner each year provides the opportunity to detect most cases of diabetes in WA. Specific programs are needed for prevention and early detection of diabetes in high risk and vulnerable groups who may not be seen in general practice.

#### 2. Initial and long term management of type 2 diabetes

Most patients with type 2 diabetes are managed in the community by general practitioners, with variable input from diabetes educators and dieticians by direct patient referral to specific practitioners, or to multidisciplinary teams operating in the government, non-government and private sectors in larger group practices, Divisions of General Practice, other community services, general hospitals or teaching hospitals. Many patients are also referred to podiatrists, ophthalmologists and optometrists, and some to private or public endocrinologists. A proactive case management approach is needed in some instances.

Diabetes self-management education, the cornerstone of diabetes care, is delivered by registered nurses, dieticians and other health professionals who have undertaken additional training to become diabetes educators. Diabetes



education is also provided by general practitioners, specialists, nurses, dieticians, pharmacists, websites and other sources.

While systematic management which targets smoking cessation and control of blood glucose, blood pressure and lipids is highly effective in preventing and slowing the macrovascular and microvascular complications of diabetes, many people with diabetes do not achieve these targets. Aboriginal people, those living in outer metropolitan, regional and rural locations, and members of other high risk and vulnerable groups continue to suffer high rates of diabetic complications, and are over-represented in hospital admission statistics.

There is a need for readily accessible, concise decision aids dealing with diabetes prevention, early diagnosis and all aspects of initial and long term diabetes management, including self-management.

Lack of knowledge of available resources and inadequate coordination of the large number of organisations and individuals providing diabetes services are significant barriers to access and optimal health outcomes. There is a pressing need to develop an efficient interface between general practice and community health services at the local level.

Previous experience in the UK and USA and recent chronic disease initiatives in WA have highlighted the importance of engaging general practice for the success of integrated management strategies.

WA Health, Area Health Services and Divisions of General Practice are well placed to facilitate the formation of local partnerships for this purpose. Local partnerships also need to include specialists, hospitals and other participants in both metropolitan and regional settings.

Innovative strategies are needed to overcome the challenges posed by service gaps, remote locations, cultural factors, language and the special needs of Aboriginal people and other high risk and vulnerable groups who suffer disproportionately high rates of morbidity and mortality from diabetes, and who account for a substantial proportion of hospital admissions.

### **3. Early detection and optimal management of complications; specialist services.**

Long-term complications of diabetes are usually asymptomatic until they reach advanced stages of tissue damage. Regular assessment for early detection and treatment is essential to prevent early complications from progressing to visual loss, renal failure, foot ulceration and lower limb amputations.

People with established diabetic complications need timely access to appropriate GP and specialist management services. Smoking cessation and improved control of blood glucose, blood pressure and lipids are able to slow progression of diabetic complications. Specialist podiatry and multidisciplinary



high-risk foot services are highly effective in preventing ulceration and amputations. In people with advanced diabetic retinopathy, laser photocoagulation is highly effective in preventing vision loss. Access to other specialists is needed for optimal management of advanced complications.

In most cases, complications screening is arranged by general practitioners, in liaison with ophthalmologists, optometrists, podiatrists and other specialists. Systematic use of guidelines, local protocols, service directories, patient registers, recall systems and patient-held management plans is needed to ensure that all people with diabetes receive comprehensive, ongoing care. Proactive programs and individual case management are needed for high risk and vulnerable groups.

Specialist endocrine review is needed for people with inadequately controlled diabetes requiring intensive therapies including insulin, those with advanced diabetic complications and other complex medical problems, and patients with severe metabolic derangements and other acute problems. Most of these patients should be referred back to their general practitioner once specific problems have been addressed and an appropriate management plan has been formulated.

All people with type 1 diabetes and all children with diabetes should be referred to specialist services for long term management.

Specialist multidisciplinary endocrinology services are currently provided in teaching hospital diabetes units and in private practice. Access to these services is limited by long waiting lists, distance, workforce shortages, restrictive funding mechanisms, and lack of specialised rapid access services.

Other specialists who play important roles in diabetes management include nephrologists, ophthalmologists, cardiologists, vascular and orthopaedic surgeons and bariatric surgeons.

The Princess Margaret Hospital Department of Endocrinology and Diabetes provides a comprehensive outreach program at multiple regional sites. WA Health does not currently provide any specialist diabetes and endocrinology outreach services for adults.

#### **4. Management of acute illness in people with diabetes**

Many emergency department attendances and hospital admissions can be prevented if people with diabetes and their health care providers have the knowledge and support to manage diabetes during metabolic upsets and acute illness without hospital admission. This is especially important for people with type 1 diabetes for whom timely appropriate care can prevent potentially life-threatening diabetic ketoacidosis.

Ready access to high quality information is essential. People with diabetes should have an action plan for managing a decline in their health status, including when and how to seek professional advice. Timely telephone contact



with a general practitioner, specialist nurse educator, diabetes educator, nurse practitioner or endocrinologist/diabetologist is often able to avert progression to serious illness and hospital admission. Lack of or failure to use these options has resulted in increasing reliance on emergency departments to fulfil this role, especially in outer metropolitan areas, contributing to excessive ED workload and compounding bed pressures.

Local systems are needed in general practice to ensure rapid access to specialist advice and assistance when needed. Area responsibilities should be allocated to specific tertiary and secondary care centres and other specialist services to ensure that all metropolitan, regional and rural primary health care providers have ready access to specialist multi-disciplinary teams for advice and shared care.

## **5. Management of diabetes in hospital**

Patients with type 2 diabetes are admitted directly to diabetes units for management of diabetic and other emergencies and for management of acute illness and advanced complications. Foot ulcers caused by neuropathy and vascular disease are a frequent cause of prolonged hospital admission, requiring close liaison with podiatry, microbiology, imaging, vascular surgery, orthopaedic surgery and home care services.

Approximately 20% of tertiary hospital inpatients have diabetes. People with diabetes have worse outcomes and longer hospital stays. Recent studies have demonstrated much better outcomes with intensive insulin therapy to maintain good blood glucose control in people admitted to hospital for heart attack, major surgery and other serious illness. Systems are needed to ensure that such treatment is available for all hospital patients with diabetes.

Many patients are admitted to general hospitals for “stabilisation” of diabetes. Such admissions are usually unnecessary and ineffective. Inadequately controlled type 2 diabetes is best managed in an ambulatory care setting by a skilled multidisciplinary team.

### **Type 1 diabetes**

An excellent multidisciplinary specialist service based at Princess Margaret Hospital for Children provides long term, high quality long term care for virtually all children and most adolescents with type 1 diabetes, as well as services for increasing numbers of children with type 2 diabetes. In addition to clinics at PMH, the service conducts regular outreach clinics in multiple regional centres.

Specialist services for adults with type 1 diabetes are provided by teaching hospital outpatient clinics and by endocrinologists in private practice. WA Health does not currently provide any specialist diabetes and endocrinology outreach services for adults.



Despite considerable efforts to improve the situation over many years, many people leaving the paediatric service do not re-establish ongoing care in adult services. These people rely on occasional general practice visits for supervision and repeat prescriptions, often have poorly controlled diabetes, and suffer high rates of advanced complications.

Paediatric and adult facilities are not well resourced for uninsured patients requiring insulin pumps. Adult centres will have great difficulty accommodating the large cohort of paediatric patients using insulin pumps.

It is important that WA patients have access to emerging technologies for insulin administration and continuous blood glucose sensing that have the potential to greatly improve management of type 1 diabetes.

### **Gestational diabetes and diabetes in pregnancy**

Comprehensive services are provided at KEMH for management of gestational diabetes and type 1 and type 2 diabetes in pregnancy. Many women with gestational, type 1 and type 2 diabetes are managed during pregnancy by endocrinologists and pregnancy medicine physicians in private practice.

Services for managing gestational diabetes are also provided by teams at Swan Health Campus, Bentley Health Service, Joondalup Health Campus, Armadale Community Health, Rockingham Kwinana Community Health and Fremantle Diabetes Service based at Fremantle Hospital.



## 5. DIABETES MODEL OF CARE

The Diabetes Model of Care provides a framework for comprehensive, accessible and efficient provision of coordinated diabetes prevention and management services for all Western Australians.

The key objective of the Diabetes Model of Care is to ensure that diabetes services are optimally configured to:

- Prevent or delay the onset of diabetes
- Prevent and slow progression of diabetic complications, especially heart disease, renal failure, impaired vision and lower limb amputations
- Improve the quality of life of people who have diabetes
- Reduce inequities in diabetes service provision, particularly for Aboriginal people and other disadvantaged groups

Additional objectives include reduced frequency of diabetes-related presentations to hospital emergency departments, lower rates of hospital admission, shorter length of stay and better outcomes for people with diabetes.

The Diabetes Model of Care addresses the following stages of diabetes prevention and management:

- Community awareness and prevention.
- Prevention and early diagnosis in high- risk groups.
- Optimal initial and long term management.
- Early detection and optimal management of complications.
- Coordinated prevention and management of acute episodes.

The Model of Care for each stage of diabetes consists of the following components:

- Health promotion
- GP-coordinated multidisciplinary prevention and management, including targeted programs for high risk and vulnerable groups
- Specialist team services

The roles of these services for each stage of diabetes are summarised in Table 3 and described in more detail in the following sections.

Detailed recommendations for implementation of each stage of the model are listed in Section VII. These are preceded by a summary of eight key priorities and related strategies which apply across multiple stages (Section VI, Table 4).



**Table 3 Diabetes Model of Care**

COMMUNITY AWARENESS & PREVENTION	PREVENTION & EARLY DIAGNOSIS IN HIGH RISK GROUPS	OPTIMAL INITIAL & LONGTERM MANAGEMENT	EARLY DETECTION & OPTIMAL MANAGEMENT OF COMPLICATIONS	PREVENTION & MANAGEMENT OF ACUTE EPISODES	SUPPORT SERVICE COORDINATION
GENERAL POPULATION	AT RISK OF DIABETES UNDIAGNOSED DIABETES	NEWLY DIAGNOSED DIABETES	ESTABLISHED COMPLICATIONS	ACUTE EPISODES	
<b>Health Promotion</b> <ul style="list-style-type: none"> <li>Awareness</li> <li>Promotion of healthy environment &amp; lifestyle (WAHPSF 2007 - 2011)</li> </ul>					<ul style="list-style-type: none"> <li>WA guidelines</li> <li>Decision aids</li> <li>Local protocols</li> <li>Local resource directories</li> <li>Diabetes care groups</li> </ul>
<b>GP - Coordinated multidisciplinary prevention &amp; management</b> <ul style="list-style-type: none"> <li>Awareness</li> <li>Promotion of healthy lifestyle</li> </ul>					<ul style="list-style-type: none"> <li>Care plans</li> <li>Commonwealth quality initiatives</li> </ul>
<b>Specialist team services</b> <ul style="list-style-type: none"> <li>Type 1 care</li> <li>Assessment of complex cases, intensified treatment</li> <li>Complications screening</li> <li>Insulin stabilisation</li> <li>Paediatric service</li> <li>Pregnancy services</li> <li>Outreach services</li> <li>Service planning, coordination</li> <li>Research</li> </ul>					<ul style="list-style-type: none"> <li>Care plans</li> <li>Commonwealth quality initiatives</li> <li>ICT data sharing, communication &amp; resources</li> <li>Local &amp; statewide registers</li> <li>Recall systems</li> <li>Audit</li> </ul>

## 5.1 Community awareness and prevention of diabetes

Effective prevention and delay of type 2 diabetes requires both a whole population approach and the specific targeting of high-risk groups. The population strategy needs to include the following elements (Table 3):

- Multi-sector promotion of a healthy environment and lifestyle to ensure that people live in an environment that supports and encourages healthy lifestyles.
- Health promotion activities to ensure that people at risk of developing diabetes and related disorders are aware of their risk and have access to appropriate information and resources to enable them to adopt healthy lifestyles.

Key strategic approaches for the promotion of healthy lifestyles and environments to reduce the risk of type 2 diabetes and other chronic diseases are detailed in the *Western Australian Health Promotion Strategic Framework 2007-2011*.

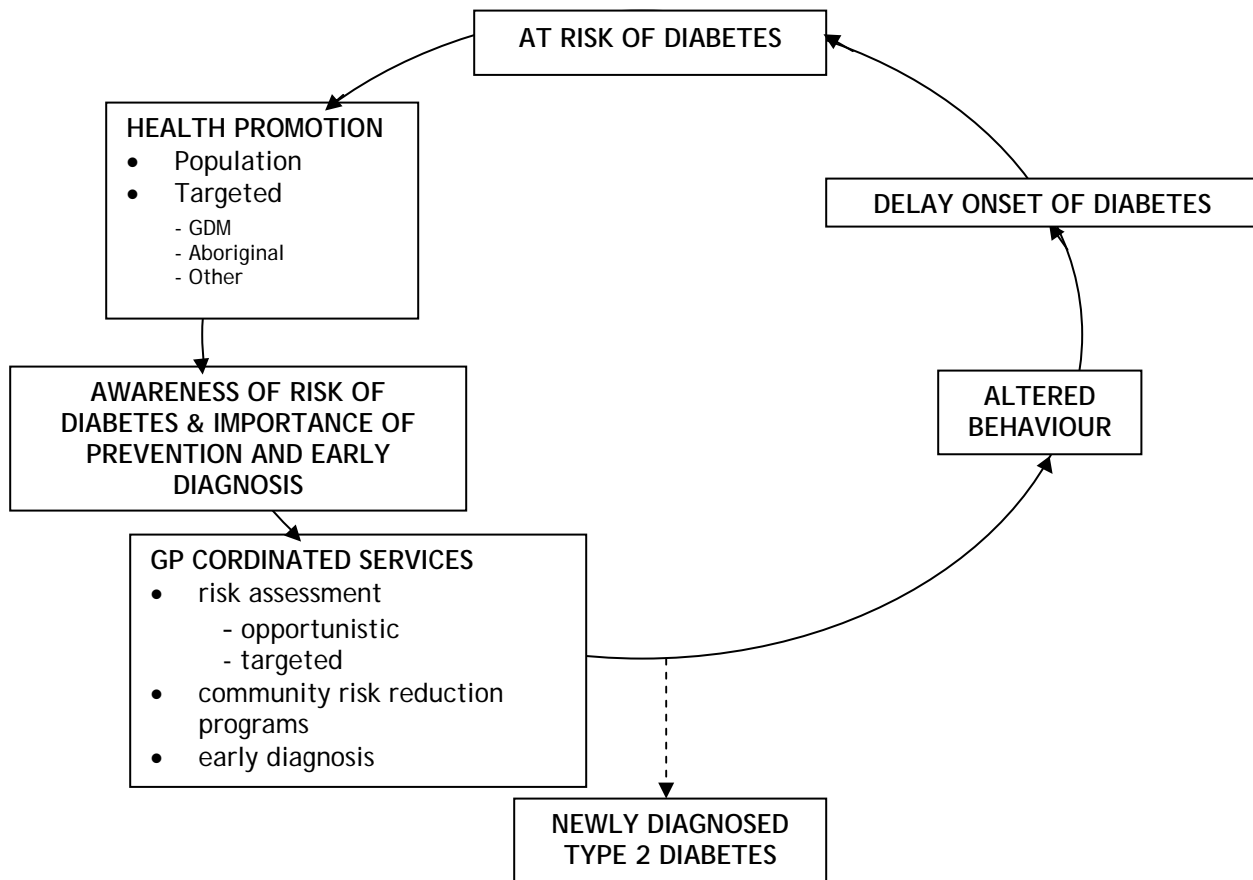
As more than 80% of Western Australians attend a general practitioner each year, general practice is well placed to make a significant contribution to increasing awareness of diabetes and promoting healthy lifestyle.

## 5.2 Prevention and early diagnosis in high-risk groups

The recommended model for early diagnosis of diabetes is summarised in Table 3 and Diagram 1. Key elements include the following:

- Community-wide and targeted health promotion activities and information resources to ensure that people throughout WA
  - are aware of risk factors for developing diabetes and for the presence of undiagnosed diabetes
  - understand the importance of early diagnosis, self-management strategies and treatment for prevention of long term complications
  - know how to reduce their risk of developing diabetes
- Systematic use of evidence-based risk assessment and early diagnosis protocols by general practitioners and other health professionals
- Prevention of diabetes in people at high risk through accessible, effective, locally coordinated, culturally appropriate community-based activities and programs targeting healthy eating, regular physical activity and moderate weight reduction
- Systems for targeted, proactive detection of diabetes in high risk and vulnerable groups, including Aboriginal people, people in remote communities, those from culturally and linguistically diverse backgrounds, and people in institutional care.

Diagram 1 Prevention and early diagnosis of diabetes



### 5.3 Optimal initial and long term management

The recommended model for optimal initial and long-term management is summarised in Table 3 and Diagram 2. Key elements include the following:

#### GP-coordinated multidisciplinary management of type 2 diabetes

- Initial patient assessment
- Provision of high quality patient information packages, adapted for location, cultural factors and special needs, readily available to all providers in all locations via WA diabetes websites and other formats
- Formulation of management plan in accordance with evidence-based WA diabetes management guidelines and local protocols
- Setting of targets for body weight, exercise, blood glucose, blood pressure, lipids; smoking cessation
- Accessible, GP-coordinated health promotion, community health, and diabetes self-management education services, with proactive case

management for high risk and vulnerable groups, supported by local resource directories and streamlined referral processes

- Accessible smoking cessation programs in all WA localities for people with diabetes who smoke
- Evidence-based use of medication to control blood glucose levels and to reduce risks of macrovascular and microvascular complications
- Systematic screening for diabetic complications, including targeted strategies for high risk, vulnerable and isolated groups (see section D)
- Use by all diabetes service providers in all locations of patient-centred electronic information systems which integrate multiple data sources from public and private providers
- Use of local and state-wide registers of people with type 1 and type 2 diabetes to enable patient recall, audit and outcome linkage strategies, and to establish long term monitoring of health outcomes via WA Linkage Service projects.
- Optimal uptake of Commonwealth quality initiatives in collaboration with Divisions of General Practice
- Hospital and home-based pharmacy review programs
- Guidelines and protocols for specialist referral

#### **Optimally configured and effective specialist services**

- Specialist services for type 2 diabetes configured to address specific problems and refer back to general practice for long term management, eg:
  - rapid access crisis clinics, stabilisation and insulin initiation clinics, complications screening clinics (see section D)
  - outreach and telehealth services to outer metropolitan, regional and rural locations for special needs and high risk groups
- Coordinated general and specialist podiatry services, multidisciplinary high risk foot clinics
- Systems to ensure optimal management of diabetes in hospital inpatients
- long term specialist multidisciplinary team care for all adults with type 1 diabetes, in collaboration with primary health care providers
- Evidence-based information packages for all adults with type 1 diabetes
- Local and statewide registers of all WA people with type 1 diabetes to aid management, patient recall, transition and long term monitoring of clinical outcomes
- Timely access to new technology for type 1 diabetes, especially insulin pumps and other insulin delivery systems, continuous glucose monitoring systems and pancreatic/islet transplantation.
- Service planning and coordination; professional education; research

## Services for children with diabetes

- Multidisciplinary tertiary specialist services for all WA children and adolescents with diabetes
- Services and protocols to support successful transition from paediatric to adult care, including liaison nurses, recall systems and case management for high risk and special needs patients.

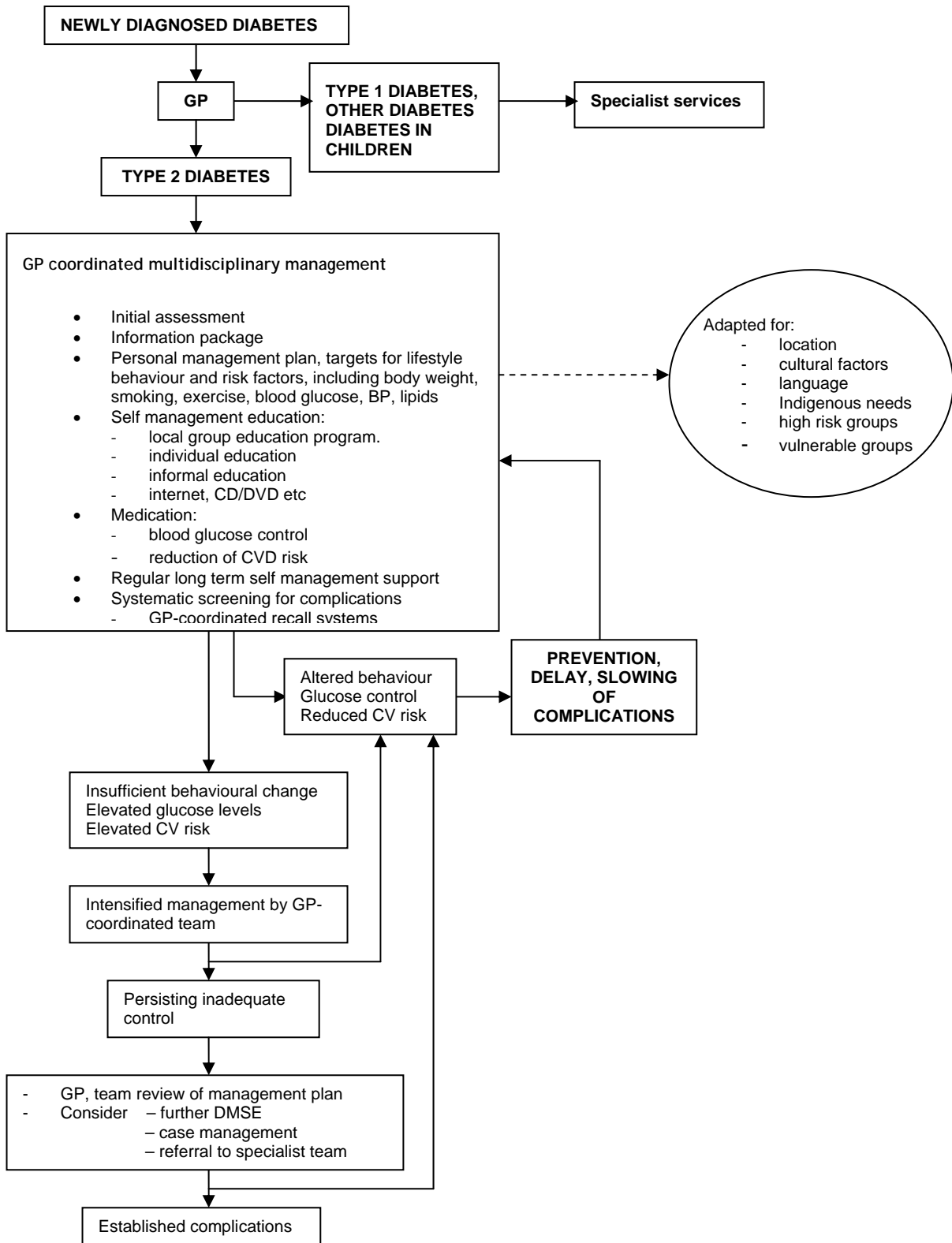
## Gestational diabetes

- Universal screening by oral glucose tolerance test (OGTT) at 24-28 weeks gestation, and earlier in pregnancy in women with previous gestational diabetes
- Regular self blood glucose monitoring
- Management by diet, exercise and, if needed, insulin, according to ADIPS guidelines (Hoffman L, Nolan C, Wilson JD et al 1998)
- Metformin may have a role in some patients
- OGTT at 6-8 weeks after delivery
- Counselling and support for lifestyle change to prevent or delay type 2 diabetes, and long term follow-up to ensure early detection of diabetes (see section B)

## Diabetes in pregnancy

- Achieve best possible control of type 1 or type 2 diabetes before conception, aiming for a HbA1c value of less than 7% while avoiding hypoglycaemia (McIntyre HD, Flack JR 2004)
- Commence supplements of folic acid and undergo assessment for detection and treatment of diabetes complications prior to conception; those who smoke should stop smoking
- Experienced specialist multidisciplinary team management of Type 1 and type 2 diabetes during pregnancy, aiming for tighter control (eg HbA1c less than 6%) to minimise the risk of pregnancy complications and longterm metabolic consequences for the child (McElduff A, Cheung NW, McIntyre HD et al 2005)
- In women with type 2 diabetes who become pregnant, metformin may be considered as an alternative or adjunct to insulin therapy in some cases (Simmons D, Walters BNJ, Rowan JA et al 2004)

Diagram 2 Optimal initial and long term management of diabetes





## 5.4 Early detection and optimal management of complications

The recommended model for early detection and optimal management of diabetes complications is summarised in Table 3 and Diagram 3. Key elements include the following:

### Awareness of diabetic complications

- Health promotion and patient education to ensure that all people with diabetes are aware of the nature of the long-term complications of diabetes, how they can be prevented and the importance of regular assessment for early detection.

### Accessible, coordinated complication detection and management services

- Accessible, coordinated complication screening services, including appropriately skilled general practitioners; ophthalmology and optometry; general and specialist podiatry; multidisciplinary specialist screening services; liaison with renal, cardiovascular and other specialist services.
- Recruitment and upskilling of other health care providers to increase capacity and improve coordination of general practice screening for complications eg practice nurses, nurse practitioners, community health workers and Aboriginal Health Workers.
- Accessible, coordinated general and specialist podiatry services, including multidisciplinary high-risk foot clinics at all tertiary hospitals and outreach high-risk foot services in regional centres.
- Proactive services to ensure comprehensive regular screening for complications in Aboriginal people and other high risk and vulnerable groups, including multidisciplinary outreach specialist services teams to visit regional and remote communities, and greater use of telehealth to support service delivery in remote areas.

### Guidelines and protocols for detection and management of diabetic complications

- WA guidelines, local protocols, service directories and referral guidelines for systematic early detection and management of diabetic complications, readily available to all providers via WA diabetes websites and other formats.
- Use of registers, recall systems and audit processes to ensure that planned assessments for complications are carried out, particularly for vulnerable and high risk groups.
- WA guidelines and local protocols are coordinated to facilitate MBS Cycle of Care, GP management plans (GPMP: item 721), multidisciplinary team care arrangement (TCA: item 723), Medicare rebates for individual and group allied health services.

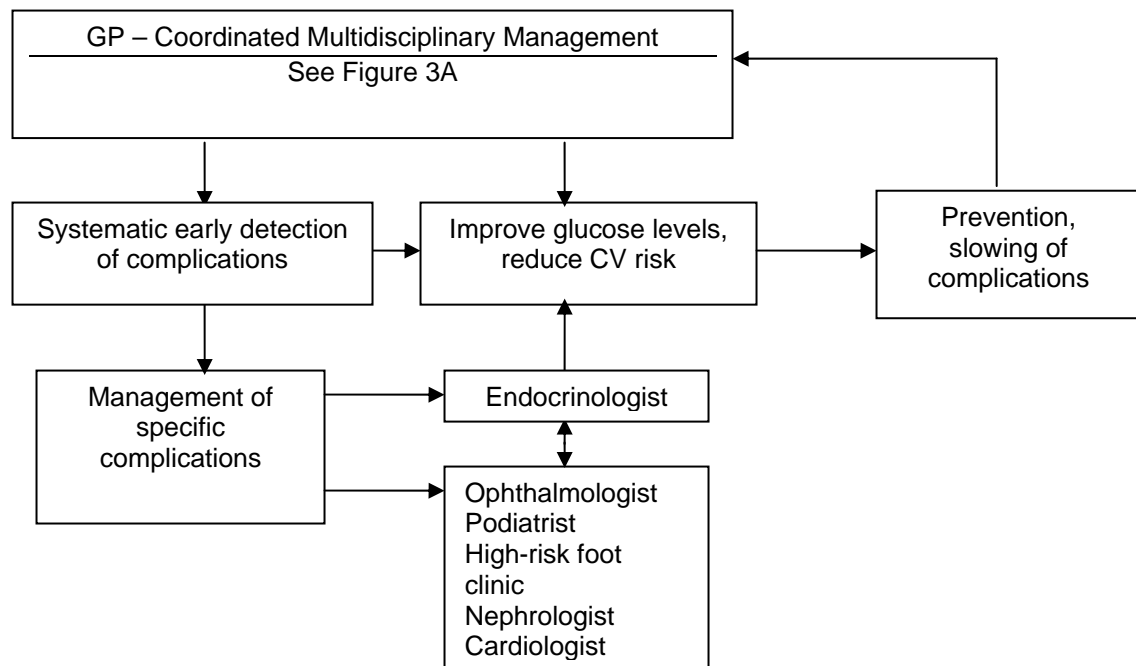


- WA guidelines, local protocols and referral guidelines for intensified treatment to slow progression of established complications

### Optimal specialist services

- see section C.

**Diagram 3 Early detection and optimal management of complications of diabetes**



## 5.5 Coordinated prevention and management of acute episodes

The recommended model of care for coordinated prevention and management of acute episodes and advanced complications is summarised in Table 3 and Diagram 4. Key elements include the following:

### Management of acute metabolic change and illness in people with diabetes

- Health promotion activities and patient education to ensure that people with type 2 and especially type 1 diabetes and their families and carers are aware of potential changes in their health, are able to identify early signs of a deterioration in diabetes status and have ready access to information about the management of a decline in the status of their diabetes.
- Each person with diabetes is provided with an action plan for managing a decline in health status, including when and how to seek professional advice.



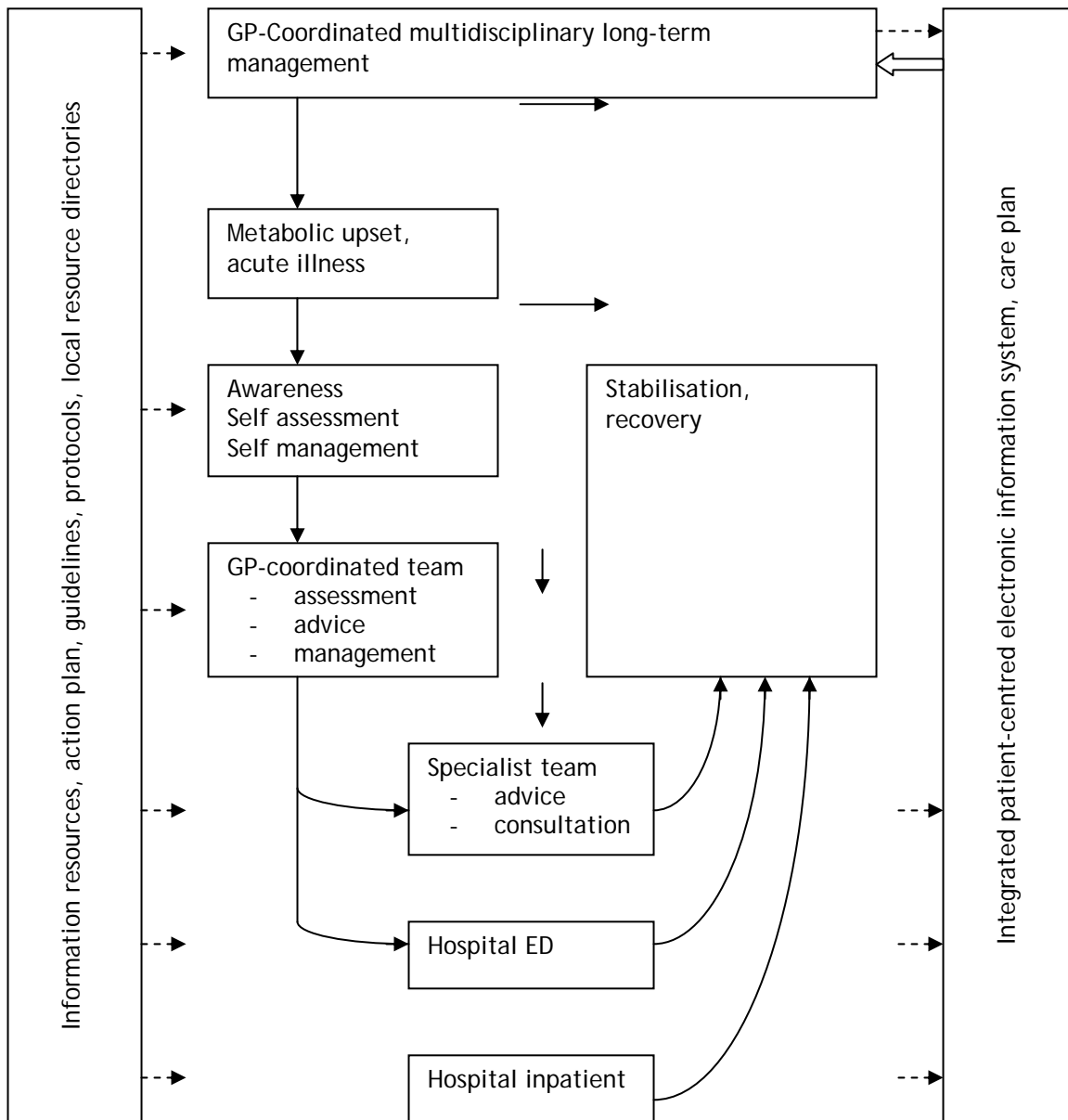
- People with diabetes who have a decline in health status have timely access to appropriate care to enable them to avoid unnecessary hospitalisations for stabilisation of diabetes:
  - All practitioners including GP's, ED services, hospital medical staff and other health providers have ready access to and use WA guidelines and local protocols to ensure appropriate management of diabetes during intercurrent illness, peri-operatively, and for management of acute diabetes-related illness including hypoglycaemia, DKA, acute foot problems and other illness
  - Local systems and web-based directories are available to ensure timely access to specialist services, including telephone access.

### Coordination across health sectors

- All WA people with diabetes have a care plan which includes a general practitioner or other health professional responsible for coordinating their care within and across the different care sectors.
- All metropolitan and regional primary health care providers have ready access to specialist multi-disciplinary teams in designated tertiary and secondary care centres for advice and shared care.
- Outreach and telehealth services are provided in accordance with community need, regional capacity and identified service gaps.
- Liaison services and patient-centred electronic information systems ensure timely, effective communication, data sharing and service coordination between general practitioners and other health care providers in primary, acute and other care settings including residential care.
- Local and statewide registers are used for patient communication, recalls, service audit and monitoring of patient outcomes.
- Medicines information and medication action plans ensure continuity in the use of medicines between episodes of care.
- WA guidelines and local protocols are coordinated to facilitate MBS Cycle of Care, GP management plans (GPMP: item 721), multidisciplinary team care arrangement (TCA: item 723), Medicare rebates for individual and group allied health services.
- Children and young people who develop diabetic ketoacidosis are managed in appropriate specialist centres.
- Systems ensure access to appropriate services for children and young people with diabetes who live in rural and remote communities



Diagram 4 Management of acute episodes



### 5.6. Research

Research must be integral to all aspects of care in order to constantly improve patient management through better understanding and new methods of treatment. Staff who are engaged in research are likely to have a more critical approach to diabetes management. The opportunity for staff to engage in research not only improves care provision but has also been shown to increase job satisfaction and staff retention.



## 6. IMPLEMENTING THE DIABETES MODEL OF CARE

Critical issues which apply across multiple stages of the Diabetes Model of Care are detailed as eight key priorities. These have been developed from the complete recommendations for implementation of each stage of the model which are detailed in Section VII. The eight key priorities are expanded in Table 4, with assessments of expected impact, feasibility and timelines. These have been guided by workshop discussions at the Endocrine Health Network's second stakeholder forum held in December 2007. Each Key Priority should be seen as a specific project for implementation.

### Key Priorities

- Enhance community-wide and targeted promotion of healthy environment and lifestyle to prevent diabetes and increase awareness of the health impact of diabetes and its complications.
- Improve coordination of community based diabetes prevention and management services, including patient self-management.
- Reconfigure specialist services for optimal effectiveness.
- Ensure ready access to guidelines, protocols, decision aids and service directories for diabetes service providers and consumers.
- Develop systems of information and communication technology support to improve communication and data sharing between GP's and other service providers, improve service quality and to monitor services and outcomes.
- Increase investment in workforce training and development.
- Ensure ready availability of new technology for diabetes.
- Foster and support basic and clinical research in diabetes.

While the model is intended for application throughout Western Australia, implementation will require flexible, networked solutions at the local level. Innovative strategies are needed to overcome the challenges posed by service gaps, remote locations, cultural factors, language and the special needs of Aboriginal people and other high risk and vulnerable groups who suffer disproportionately high rates of morbidity and mortality from diabetes, and who account for a substantial proportion of hospital admissions.



**Table 4 Diabetes Model of Care: Key priorities**

**Note: Numbers in brackets following strategy points relate to specific recommendations covered in Section VI**

PRIORITY ONE	ENHANCE COMMUNITY-WIDE AND TARGETED PROMOTION OF HEALTHY ENVIRONMENT AND LIFESTYLE TO PREVENT DIABETES AND INCREASE AWARENESS OF THE HEALTH IMPACT OF DIABETES AND ITS COMPLICATIONS			
STRATEGIES	EXPECTED IMPACT	FEASIBILITY OF IMPLEMENTATION	TIMELINES	
<ul style="list-style-type: none"> <li>▪ Develop a collaborative, integrated approach involving Commonwealth, WA and local governments; NGO's, community groups; employers and the food industry to ensure that people live in an environment that supports and encourages healthy lifestyles.(1)</li> <li>▪ System-wide support for the implementation of the <i>Western Australian Health Promotion Strategic Framework 2007-2011</i></li> <li>▪ Undertake and facilitate community-wide and targeted health promotion activities to ensure that people throughout WA are aware of:               <ul style="list-style-type: none"> <li>- their risk of developing diabetes;</li> <li>- risk factors for the presence of undiagnosed diabetes;</li> <li>- the importance of early diagnosis, and treatment and self-management for prevention of long term complications;</li> <li>- information and resources to enable adoption of healthy lifestyles;</li> <li>- the nature of the long term complications of diabetes, how they can be prevented; and</li> <li>- the importance of regular assessment for early detection. (2,3,14)</li> </ul> </li> <li>▪ Promote smoke free policies in health services in partnership with NGOs; e.g. Diabetes WA, Cancer Council, and ensure that affordable smoking cessation programs are available in all WA localities to people with diabetes who smoke (7f).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduced population rates of diabetes and diabetic complications, especially cardiovascular disease.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Requires long term, high level multi-sector commitment and investment.</li> <li>▪ Endocrine Health Network will provide advocacy and system-wide policy support</li> <li>▪ Addressed in Health Promotion Strategic Framework 2007-2010.</li> </ul>	<p>Current, ongoing, long term</p>	



PRIORITY TWO	IMPROVE DIABETES PREVENTION AND MANAGEMENT SERVICES INCLUDING PATIENT SELF MANAGEMENT		
STRATEGIES	EXPECTED IMPACT	FEASIBILITY OF IMPLEMENTATION	TIMELINES
<ul style="list-style-type: none"> <li>▪ Develop policy and programs for integrated diabetes services at the Area Health Service level in accordance with the Diabetes Model of Care (6)</li> <li>▪ Improve coordination, capacity and effectiveness of community health promotion services, diabetes prevention activities and diabetes self-management education services, including capability for proactive case management for high risk and vulnerable groups (4b, 4d, 7a)</li> <li>▪ develop an efficient interface between community based diabetes prevention and management services with each Division of General Practice and other local diabetes care groups to enable provision of accessible, integrated GP-coordinated local services, using streamlined referral processes and local resources directories (7b, c)</li> <li>▪ Facilitate formation of local diabetes care groups (7c)</li> <li>▪ Investigate options for co-location of community diabetes services , eg at general hospitals, Divisions of General Practice, general practices or separate community centres, investigate especially in areas of high need (7d)</li> <li>▪ Allocate regional responsibilities to specific tertiary and secondary care centres to ensure that all metropolitan and regional primary health care providers have ready access to specialist multi-disciplinary teams for advice and shared care (20e)</li> <li>▪ Establish systems to ensure timely, effective communication between health professionals and other care providers to assist transition between acute, primary and community care settings including residential care services, eg liaison services, IT systems (see below) (20b)</li> <li>▪ Develop procedures to facilitate successful transition from paediatric to adult care, including liaison nurses, recall systems and case management for high risk and special needs patients (12b)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improved accessibility and quality of diabetes care, especially for high risk and vulnerable groups, and in areas with major service gaps.</li> <li>▪ Better initial care of diabetes, reduced rates of complications, early detection of complications, better management of advanced complications.</li> <li>▪ Reduced ED presentations, admissions, LOS.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Requires WA Health, Area Health Services and WA Country Health Service to take responsibility for the development of statewide policies and programs for integrated diabetes services, in partnership with Divisions of General Practice and other Health Networks, especially Renal and Cardiovascular Networks.</li> </ul>	<p>Planning, consultation: 2008  Pilot project: 2009  Statewide implementation 2010</p>



PRIORITY THREE	RECONFIGURE SPECIALIST SERVICES FOR OPTIMAL EFFECTIVENESS		
STRATEGIES	EXPECTED IMPACT	FEASIBILITY OF IMPLEMENTATION	TIMELINES
<ul style="list-style-type: none"> <li>▪ Provide new specialised services, eg crisis clinics, insulin initiation services, and high risk foot clinics (11a, 16d, 18, 20f)</li> <li>▪ Improve coordination, capacity and effectiveness of complication screening services, and ensure coordination and collaboration with renal, cardiovascular and other relevant health networks (16a)</li> <li>▪ Improve coordination, capacity and effectiveness of general and specialist podiatry services; establish high risk foot clinics at all tertiary hospitals and provide outreach high risk foot services to regional centres (16d)</li> <li>▪ Establish outer metropolitan and regional outreach and telehealth services, including complication screening services for high risk, vulnerable and under-resourced groups (11a, 17b)</li> <li>▪ Ensure that all WA children and adolescents with diabetes receive care from multidisciplinary tertiary specialist services with the expertise and resources needed to achieve optimal glycaemic control while minimising the risks of hypoglycaemia and the chronic complications of diabetes, as well as facilitating normal growth and development and fostering adjustment of the child and family to diabetes (12a)</li> <li>▪ Establish systems ensure that children and young people with diabetes who develop DKA are treated in appropriate specialist centres develop systems to ensure access to appropriate services for children and young people in rural and remote communities (19d)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improved accessibility, efficiency and effectiveness of specialist services.</li> <li>▪ Improved coordination with community services and other sectors.</li> <li>▪ Improved rural services.</li> <li>▪ Improved services for Aboriginal and other high risk groups.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Requires teaching hospital diabetes services to review and reconfigure services to improve access, maximise effectiveness and provide new specialised services</li> <li>▪ Some reconfiguration feasible within existing resources. More extensive changes will require additional staffing and resources.</li> <li>▪ Mechanisms need to be developed to enable public and private specialist services to be provided in outer metro and regional locations within an integrated diabetes service model.</li> </ul>	<p>Planning, consultation: 2008</p> <p>Implementation 2008/9</p>



PRIORITY FOUR	ENSURE READY ACCESS TO GUIDELINES, PROTOCOLS, DECISION AIDS AND SERVICE DIRECTORIES FOR DIABETES SERVICE PROVIDERS AND CONSUMERS		
STRATEGIES	EXPECTED IMPACT	FEASIBILITY OF IMPLEMENTATION	TIMELINES
<ul style="list-style-type: none"> <li>▪ Form multidisciplinary advisory groups to coordinate and facilitate the collation, development, promotion, regularly updating and audit of:               <ul style="list-style-type: none"> <li>- risk assessment and early diagnosis protocols (4a)</li> <li>- type 1 and type 2 diabetes patient information packages (10a, b, 11c)</li> <li>- guidelines, protocols and local service directories for:                   <ul style="list-style-type: none"> <li>- optimal management of type 2 diabetes (9a)</li> <li>- diagnosis and management of gestational diabetes (13)</li> </ul> </li> <li>- systematic early detection and management of diabetic complications (15)</li> <li>- management of diabetes during acute illness (19b)</li> <li>- management of diabetes in hospital inpatients (19c)</li> <li>- multidisciplinary specialist management of all people with type 1 diabetes in collaboration with general practice (11b)</li> </ul> </li> <li>▪ Ensure that guidelines, protocols and resource directories are adapted for location, cultural factors and special needs, and are readily available via WA diabetes websites and in other formats to all individual providers and to Divisions of General Practice, local diabetes care groups, hospitals and specialist services in all locations including outer metropolitan, regional centres, rural and remote localities</li> <li>▪ Develop, evaluate and implement new strategies to detect diabetes and ensure comprehensive screening for complications in high risk and vulnerable groups (4c, 17a)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consistent evidence-based clinical best practice.</li> <li>▪ Consistent current information for patients and improved self-management practice.</li> <li>▪ Knowledge sharing and improved collaboration</li> </ul>	<ul style="list-style-type: none"> <li>▪ Needs a steering committee and regional input but easy to implement and achievable.</li> <li>▪ Primary care interface critical for success.</li> <li>▪ Needs consensus across sectors</li> <li>▪ Can build on the considerable information that is already available.</li> <li>▪ Needs to be well promoted.</li> <li>▪ Develop website (in progress)</li> </ul>	<p>Planning, consultation, implementation 2008</p>



PRIORITY FIVE	DEVELOP SYSTEMS OF INFORMATION AND COMMUNICATION TECHNOLOGY SUPPORT TO IMPROVE COMMUNICATION AND DATA SHARING BETWEEN GP'S AND OTHER SERVICE PROVIDERS, IMPROVE SERVICE QUALITY AND MONITOR SERVICES AND OUTCOMES		
STRATEGIES	EXPECTED IMPACT	FEASIBILITY OF IMPLEMENTATION	TIMELINES
<ul style="list-style-type: none"> <li>▪ Establish patient-centred electronic information systems which can integrate multiple data sources from public and private providers to improve communication and data sharing between GP's and all other providers, including introduction of practice management software for outpatient clinics, specialists and allied health services (7e)</li> <li>▪ Assist GP's, specialists and other providers to provide detailed individual patient plans for regular assessment for each of the major complications of diabetes, and to establish and use local and WA registers, recall systems and audit processes to ensure that planned assessments for complications are carried out, particularly for vulnerable and high risk groups (15c)</li> <li>▪ Establish registers of all WA patients with type 1 and type 2 diabetes to aid management, develop patient recall systems, improve transition from childhood and adolescent services to adult care and to enable long term monitoring of health outcomes via WA Linkage Service projects (9c, 11d)</li> <li>▪ Promote and support uptake of Commonwealth quality initiatives and pharmacy review programs in collaboration with Divisions of General Practice (9d, 9e, 15d)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Essential infrastructure for health service reform.</li> <li>▪ Improved continuity and timeliness of patient care</li> <li>▪ Reduced duplication of services (e.g. pathology)</li> <li>▪ Standardisation of care.</li> <li>▪ Improved follow-up, outcomes and patient safety.</li> <li>▪ Patient registers essential for monitoring of long term outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Will need time, planning, coordination and stakeholder buy-in, especially general practice, for success. Work with Divisions of General Practice and chronic disease/ambulatory care teams.</li> <li>▪ Needs to be a whole-of-health initiative</li> <li>▪ Need to address data privacy and security issues.</li> <li>▪ Initially costly but huge potential for substantial cost-benefit in the long term.</li> <li>▪ Diabetes registers very feasible: require allocation of dedicated resources</li> </ul>	<p>Planning 2008 Implementation 2009 -2011</p>



PRIORITY SIX	INCREASE INVESTMENT IN WORKFORCE TRAINING AND DEVELOPMENT		
STRATEGIES	EXPECTED IMPACT	FEASIBILITY OF IMPLEMENTATION	TIMELINES
<ul style="list-style-type: none"> <li>▪ Conduct audit of diabetes services (8a)</li> <li>▪ Provide support for recruitment, training and upskilling of practice nurses, diabetes educators, dieticians, podiatrists, nurse practitioners, exercise physiologists, physiotherapists, pharmacists, community health workers, Aboriginal Health Workers and other health care providers to assist general practitioners to identify people at risk of diabetes, coordinate risk reduction and self-management activities and to fill other gaps in diabetes services, including community based screening for the complications of diabetes (5, 8b, 16c, 17c)</li> <li>▪ Ensure adequate numbers of adult and paediatric endocrinology training positions, and extend training into general hospitals, outer metropolitan, regional and rural services and private practice (8e)</li> <li>▪ Promote, facilitate and support healthcare provider education, including self-management principles, complication detection, local consensus processes, peer review and audit to improve standards of diabetes care in primary care, outpatient clinics and other settings (9b, 16b)</li> <li>▪ Establish local systems for management of diabetes during acute illness to prevent unnecessary hospitalisation for 'stabilisation' of diabetes, via education, of GP's, ED services, other health providers; local protocols; resource directories; telephone access to specialist services (19)</li> <li>▪ Consider extending WA pilot programs for technological support eg telephone coaching, remote monitoring, COACH, etc (8c). Investigate Telehealth as an option to support service delivery in remote areas (17d)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improved and more timely access to services resulting in better patient outcomes.</li> <li>▪ Reduced admissions and LOS.</li> <li>▪ Improved staff retention and job satisfaction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Must start planning now. Phased approach.</li> <li>▪ Some additional funding required.</li> <li>▪ Involve universities and professional organizations.</li> </ul>	<p>Planning 2008</p>



PRIORITY SEVEN	ENSURE READY AVAILABILITY OF NEW TECHNOLOGY FOR DIABETES			
STRATEGIES		EXPECTED IMPACT	FEASIBILITY OF IMPLEMENTATION	TIMELINES
<ul style="list-style-type: none"> <li>▪ Increase the availability of:               <ul style="list-style-type: none"> <li>- insulin pumps and other insulin delivery systems.</li> <li>- continuous glucose monitoring devices</li> <li>- pancreatic and islet cell transplantation</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>▪ Improved management of type1 diabetes</li> <li>▪ Reduced complications</li> <li>▪ Improved QOL for people with Type 1</li> <li>▪ Fewer acute episodes requiring specialist care and hospital admission</li> </ul>	<ul style="list-style-type: none"> <li>▪ Need to work with Commonwealth and other stakeholders to address funding/resourcing and equity of access issues.</li> <li>▪ Commence consultation and planning</li> </ul>	2008/2009
PRIORITY EIGHT	FOSTER AND SUPPORT BASIC AND CLINICAL RESEARCH IN DIABETES, AND FACILITATE PATIENT INCLUSION IN CLINICAL TRIALS			
STRATEGIES		EXPECTED IMPACT	FEASIBILITY OF IMPLEMENTATION	TIMELINES
<ul style="list-style-type: none"> <li>▪ Foster and support basic and clinical research in diabetes and facilitate patient inclusion in clinical trials (21a,b)</li> <li>▪ Support the research objectives stated in the WA State-wide Chronic Disease Self-Management Strategy, especially pertaining to diabetes services (Centre for Research into Disability and Society, 2006) (21c)</li> <li>▪ Consider establishment of a WA Diabetes and Endocrinology Institute (21d)</li> </ul>		<ul style="list-style-type: none"> <li>▪ Enhance culture of continual improvement</li> </ul>	<ul style="list-style-type: none"> <li>▪ Requires continuation and expansion of current research support</li> </ul>	Current, ongoing, long term



## 7. RECOMMENDATIONS FOR THE DIABETES MODEL OF CARE

### COMMUNITY AWARENESS AND PREVENTION OF DIABETES

1. Healthy environment and lifestyle:

WA Health to develop a collaborative, integrated and strategic approach involving Commonwealth, WA and local governments, NGO's, community groups, employers and the food industry to ensure that people live in an environment that supports and encourages healthy lifestyles.

2. Community awareness of diabetes risk:

WA Health, in partnership with Divisions of General Practice, NGO's and other groups, to undertake and facilitate health promotion activities to ensure that people at risk of developing diabetes and related disorders are aware of their risk and have access to appropriate information and resources to enable them to adopt healthy lifestyles.

### PREVENTION AND EARLY DIAGNOSIS IN HIGH-RISK GROUPS

3. Awareness of risk factors for diabetes and the importance of early diagnosis:

WA Health, Area and Country Health Services, in partnership with Endocrine Health Network, Divisions of General Practice, Aboriginal Medical Services, community groups, NGO's, health insurance funds, employers and other relevant groups to ensure that people throughout WA are aware of risk factors for the presence of undiagnosed diabetes, understand the importance of early diagnosis, self-management and treatment for prevention of long term complications and know how to reduce their risk of developing diabetes by:

- a. undertaking community-wide and targeted health promotion activities
- b. developing appropriate information resources.

4. Accessible risk assessment, prevention and early detection services:

- a. Endocrine Health Network to form a multidisciplinary advisory group including representation from Divisions of General Practice and Diabetes WA to collate, develop, distribute, promote and audit evidence-based risk assessment and early diagnosis protocols to all general practitioners and other health professionals to ensure comprehensive identification of people at high risk of diabetes.
- b. WA Health to work with Area and Country Health Services, Divisions of General Practice and local diabetes care groups to improve local coordination, accessibility and effectiveness of community health promotion services and diabetes prevention activities.
- c. WA Health, Area and Country Health Services to develop, evaluate and implement new strategies to detect diabetes in high risk and vulnerable groups who do not attend general practitioners, including



Aboriginal people, people in remote communities, those from culturally and linguistically diverse and backgrounds, and people in institutional care, eg via community health nurses, community health workers, pharmacists, open access fasting blood glucose measurement.

- d. WA Health, Area and Country Health Services, in partnership with Divisions of General Practice, Aboriginal Medical Services, community groups, NGO's, health insurance funds, employers and local government to evaluate and implement coordinated, evidence-based, culturally appropriate community based programs to assist people at high risk of developing diabetes to adopt healthy lifestyles.

5. Workforce:

WA Health, Area and Country Health Services to assist general practice and relevant community organisations to recruit, train and employ practice nurses, community health workers, Aboriginal Health Workers, nurse practitioners and other staff to identify people at risk of diabetes and coordinate risk reduction activities.

## OPTIMAL INITIAL AND LONG TERM MANAGEMENT

6. Area and Country Health Service plans for diabetes management:

Each Area and Country Health Service to develop policy, programs and initiatives for area-wide management of diabetes in partnership with Divisions of General Practice and other relevant groups, based on the Endocrine Health Network Diabetes Model of Care.

7. Service integration:

WA Health, Area and Country Health Services and Divisions of General Practice, with support of Endocrine Health Network, and in accordance with the Diabetes Model of Care, to develop and implement plans to:

- a. develop integrated, coordinated and expanded community health, health promotion and diabetes self-management education services, including capacity for proactive case management for high risk and vulnerable groups.
- b. develop an efficient interface with each Division of General Practice to enable provision of GP-coordinated, integrated, accessible community diabetes services at the local level, including streamlined referral processes and local resources directories.
- c. form local diabetes care groups in partnership with Divisions of General Practice, specialists, hospitals, Aboriginal Medical Services, community groups, NGO's and local government.
- d. investigate options for co-location of community diabetes services, eg at general hospitals, Divisions of General Practice, general practices or separate community centres.



- e. establish patient-centred electronic information systems which can integrate multiple data sources from public and private providers.
- f. in partnership with NGOs, eg Diabetes WA, Cancer Council, promote smoke free policies in health services, and ensure that affordable smoking cessation programs are available in all WA localities to people with diabetes who smoke.

**8. Accessible services:**

- a. Conduct audit of diabetes services and workforce to determine the nature and capacity of diabetes services across the State, and to help WA Health, Area and Country Health Services to identify service gaps, especially in rural and remote areas with high risk and vulnerable populations.
- b. WA Health, Area and Country Health Services to provide support for recruitment, training and upskilling of other providers to assist general practitioners to fill service gaps, especially practice nurses, diabetes educators, dieticians, podiatrists, nurse practitioners, exercise physiologists, physiotherapists, pharmacists, Aboriginal Health Workers.
- c. Extend WA pilot programs for technological support of chronic diseases such as diabetes eg telephone coaching, remote monitoring, COACH, telehealth etc.
- d. WA Health to collaborate with relevant stakeholders to develop and maintain accredited training for allied health professionals, practice nurses, community health workers and Aboriginal Health Workers to participate in diabetes prevention and management, including self-management.
- e. Increase the number of endocrinology training positions including general hospital, outer metro, rural and private practice training posts.

**9. Systematic, evidence-based diabetes management:**

- a. Endocrine Health Network to:
  - i. Form a statewide multidisciplinary advisory panel to collate, develop, distribute, promote and regularly update evidence-based WA diabetes management guidelines and local protocols for all service providers, adapted for location, cultural factors and special needs
  - ii. Ensure ready availability to all providers and to Divisions of General Practice, local hospitals, specialist services etc in metro, outer metro, regional centres, rural and remote localities via WA diabetes websites and other formats.
- b. Endocrine Health Network to promote, facilitate and support healthcare provider education, local consensus processes, peer



review and audit to improve standards of diabetes care in primary care, outpatient clinics and other settings.

- c. WA Health, Area and Country Health Services to facilitate establishment of local and statewide registers of people with Type 1 and Type 2 diabetes to enable patient recall, audit and outcome linkage strategies, and to establish long term monitoring of health outcomes via WA Linkage Service projects.
- d. WA Health, Area and Country Health Services to promote and support uptake of Commonwealth quality initiatives in collaboration with Divisions of General Practice eg MBS Annual Cycle of Care for diabetes, GP management plans (GPMP: item 721), multidisciplinary team care arrangement (TCA: item 723), Medicare rebates for individual and group allied health services
- e. WA Health and Endocrine Health Network to promote and support hospital and home-based pharmacy review programs in collaboration with Divisions of General Practice.

**10. Type 2 diabetes patient information packages:**

Endocrine Health Network to:

- a. Form a state-wide multidisciplinary advisory panel to collate, develop, distribute, promote and regularly update evidence-based patient information packages for people with type 2 diabetes, adapted for location, cultural factors and special needs.
- b. Ensure ready availability of the package to all providers, Divisions of General Practice, local hospitals, specialist services etc in metro, outer metro, regional centres, rural and remote localities via WA diabetes websites and other formats.

**11. Maximally effective specialist services:**

- a. Endocrine Health Network to assist Area and Country Health Services to review and reconfigure specialist services for optimal effectiveness, including establishment of outreach and telehealth services for outer metropolitan, rural and Aboriginal patients and special needs groups; specific purpose clinics and other service innovations, and to ensure high quality service planning and coordination, professional education and research.
- b. Endocrine Health Network to form a state-wide multidisciplinary advisory panel to collate, develop, distribute, promote and regularly update evidence-based protocols and resource directories for general practitioners and other providers to ensure that all adults with type 1 diabetes receive long term care from a specialist multidisciplinary team in collaboration with primary health care providers.
- c. Endocrine Health Network to form a state-wide multidisciplinary advisory panel to collate, develop, distribute, promote and regularly



update evidence-based information packages for all adults with type 1 diabetes to all providers and to ensure availability to Divisions of General Practice, local hospitals, specialist services etc in metro, outer metro, regional centres, rural and remote localities via WA diabetes websites and other formats.

- d. Endocrine Health Network to develop a register of all WA patients with type 1 diabetes to aid management, patient recall, transition and the monitoring of relevant clinical outcomes.
- e. WA Health, Area and Country Health Services to support timely uptake of new technology for type 1 diabetes, especially insulin pumps and other insulin delivery systems, continuous glucose monitoring systems and pancreatic transplantation.

**12. Services for children with diabetes:**

- a. WA Health, Area and Country Health Services to ensure that all WA children and adolescents with diabetes receive care from multidisciplinary tertiary specialist services. These services must have the expertise and resources necessary to achieve optimal glycaemic control while minimising the risks of hypoglycaemia and the chronic complications of diabetes, as well as facilitating normal growth and development and fostering adjustment of the child and family to diabetes.
- b. WA Health, Area and Country Health Services to develop improved services and protocols to support successful transition from paediatric to adult care, including liaison nurses, recall systems and case management for high risk and special needs patients.

**13. Gestational diabetes and diabetes in pregnancy**

- a. Establish systems to ensure comprehensive screening for gestational diabetes
- b. Develop, promote and audit use of evidence based guidelines and local protocols for GP-coordinated multidisciplinary management of gestational diabetes
- c. Ensure that all WA women have ready access to experienced multidisciplinary services for management of type 1 and type 2 diabetes during pregnancy

**EARLY DETECTION AND OPTIMAL MANAGEMENT OF COMPLICATIONS**

**14. Awareness of diabetic complications:**

WA Health, Area and Country Health Services, in partnership with Divisions of General Practice, relevant NGO's and other groups, to ensure that all people with diabetes are aware of the nature of the long term complications of diabetes, how they can be prevented and the importance of regular assessment for early detection.



- 15. Guidelines and protocols for detection and management of diabetic complications:**
- a.** Endocrine Health Network to:
    - i.** form a statewide multidisciplinary advisory panel to collate, develop, distribute, promote and regularly update evidence-based WA guidelines for systematic early detection and management of diabetic complications, adapted for location, cultural factors and special needs
    - ii.** ensure ready availability to all providers and to Divisions of General Practice, local hospitals, specialist services etc in metro, outer metro, regional centres, rural and remote localities via WA diabetes websites and other formats.
  - b.** WA Health, Area and Country Health Services to assist Divisions of General Practice and local diabetes groups to develop comprehensive, regularly updated local service directories, protocols and referral guidelines for detection and management of specific diabetic complications.
  - c.** WA Health, Area and Country Health Services, in partnership with Divisions of General Practice and local diabetes groups, to assist GP's, specialists and other providers to provide detailed individual patient plans for regular assessment for each of the major complications of diabetes, and to establish and use registers, recall systems and audit processes to ensure that planned assessments for complications are carried out, particularly for vulnerable and high risk groups.
  - d.** WA Health, Area and Country Health Services, in partnership with Divisions of General Practice, to ensure that WA guidelines, are local protocols coordinated to facilitate MBS Cycle of Care, GP management plans (GPMP: item 721), multidisciplinary team care arrangement (TCA: item 723), Medicare rebates for individual and group allied health services
- 16. Accessible, coordinated complication detection and management services:**
- a.** WA Health, Area and Country Health Services, in partnership with Divisions of General Practice, podiatry, renal, ophthalmology and cardiovascular services to increase utilisation, efficiency and coordination of existing complication screening services, including ophthalmology and optometry; general community and high risk podiatry.
  - b.** Area and Country Health Services, in partnership with Divisions of General Practice, RACGP and specialist groups, to support training of general practitioners in complication detection.
  - c.** WA Health, Area and Country Health Services, in partnership with Divisions of General Practice, to support and facilitate recruitment and upskilling of other providers to increase the capacity of general



practice eg practice nurses, nurse practitioners and community health workers.

- d. Area and Country Health Services to establish high risk foot clinics at all tertiary hospitals and provide outreach high risk foot services to regional centres.

**17. Detecting complications in high risk groups**

- a. WA Health, Area and Country Health Services, in partnership with Divisions of General Practice and other key groups including podiatry, nephrology and ophthalmology, to develop specific strategies for comprehensive screening for complications in Aboriginal people and other high risk and vulnerable groups, in accordance with Foundations for Country Health Service Delivery objectives.
- b. WA Health, Area and Country Health Services, in partnership with Divisions of General Practice and other key groups including podiatry, nephrology and ophthalmology, to develop multidisciplinary outreach specialist services/teams to visit remote communities, including regular complication screening of Aboriginal people and other vulnerable and high risk groups.
- c. WA Health, Area and Country Health Services, in partnership with Divisions of General Practice, to train and support community health professionals including Aboriginal Health Workers in community based screening for the complications of diabetes.
- d. Area and Country Health Service to increase use of telehealth to support service delivery in remote areas.

**18. Optimal specialist services**

Area Health Services to review and reconfigure specialist endocrine services to improve access, maximise effectiveness and provide new specialised services, eg general hospital, outer metro clinics, complication screening, high risk foot care, etc

**COORDINATED PREVENTION AND MANAGEMENT OF ACUTE EPISODES**

**19. Management of acute metabolic change and illness in people with diabetes**

- a. Undertake health promotion and education activities to ensure that people with type 2 and especially type 1 diabetes and their families and carers:
  - i. are aware of potential changes in their health, are able to identify early signs of a deterioration in diabetes status
  - ii. have ready access to information about the management of a decline in the status of their diabetes, and have an action plan for



managing such problems, including when and how to seek professional advice

- b. Ensure that people with diabetes who have a decline in health status have timely access to high quality, evidence-based care and avoid unnecessary hospitalisation:
  - i. develop, promote and distribute WA guidelines and local protocols for optimal management of diabetes during periods of diabetic instability and acute illness
  - ii. provide education and training to GP's and other health providers in diabetes management during illness
  - iii. ensure Divisions of General Practice and other diabetes care groups have local systems and resource directories to ensure timely access to specialist services, including telephone access
- c. Ensure that people with diabetes receive optimal diabetes management during hospital admission for medical or surgical problems:
  - i. develop, promote and distribute WA guidelines and local protocols for management of diabetes during acute illness and perioperatively
  - ii. provide education and training in diabetes management during illness and perioperatively for GP's, hospital medical and nursing staff, and in all specialist medical training programs
  - iii. establish inpatient diabetes care teams in tertiary and general hospitals
  - iv. implement support programs and telehealth services in areas
- d. Ensure that children and young people with diabetes who develop DKA are treated in appropriate specialist centres.

## 20. Coordination across health sectors

- a. Ensure that all WA people with diabetes have a care plan which includes a general practitioner or other health professional responsible for coordinating their care within and across the different care sectors.
- b. Establish liaison, triage and IT systems to ensure timely, effective communication between health professionals and other care providers to aid the transition of people with diabetes between acute, primary and community care settings, including residential care services
- c. Develop integrated patient-centred electronic information systems which can integrate multiple data sources from public and private providers to improve communication, coordination, data sharing between GP's and all other providers, and to provide access to private pathology providers in public hospital clinics.
- d. Develop a single state-wide system for a unique patient identifier code



- e. Allocate regional responsibilities to specific tertiary and secondary care centres to ensure that all metropolitan and regional primary health care providers have ready access to specialist multi-disciplinary teams for advice, shared care, outreach and telehealth services.
- f. Develop and expand outreach and telehealth services to fill identified service gaps.
- g. Provide appropriate transport and accommodation for patients who are required to travel.
- h. Ensure WA guidelines and local protocols are coordinated to facilitate MBS Cycle of Care, GP management plans (GPMP: item 721), multidisciplinary team care arrangement (TCA: item 723) and Medicare rebates for individual and group allied health services
- i. Provide medicines information and develop medication action plans to ensure continuity in the use of medicines between episodes of care.
- j. Develop systems and services to ensure access to appropriate services for children and young people residing in rural and remote communities.

## RESEARCH

### 21. Diabetes research:

- a. WA Health, Area and Country Health Services to foster and support basic and clinical research in diabetes.
- b. Clinical services to facilitate patient inclusion in clinical trials.
- c. WA Health, Area and Country Health Services to support the research objectives stated in the WA State-wide Chronic Disease Self-Management Strategy, especially pertaining to diabetes services (Centre for Research into Disability and Society, 2006)
- d. Consider establishment of Diabetes and Endocrinology Institute.



## GLOSSARY

ABS	Australian Bureau of Statistics
ADEA	Australian Diabetes Educators Association
ADIPS	Australian Diabetes in Pregnancy Society
AIHW	Australian Institute of Health & Welfare
Aboriginal	Aboriginal and Torres Strait Islander
CDE	Credentialed Diabetes Educator
DKA	Diabetic ketoacidosis
DSME	Diabetes Self Management Education
ED	Emergency Department
FH	Fremantle Hospital
GP	General practitioner
GPMP	General Practice Management Plan
GTT	Glucose tolerance test
HACC	Home and Community Care
HbA1c	Glycated haemoglobin
HWSS	Health and Well-being Surveillance System
IFG	Impaired fasting glucose
IGT	Impaired glucose tolerance
IT	Information Technology
KEMH	King Edward Memorial Hospital
MBS	Medical Benefits Scheme
NDSS	National Diabetes Supply Scheme
NGO	Non-government organisation
NHPAC	National Health Priority Action Council
NMAHS	North Metropolitan Area Health Service
PMH	Princess Margaret Hospital for Children
RACGP	Royal Australian College of General Practitioners
RPH	Royal Perth Hospital
SCGH	Sir Charles Gairdner Hospital
SMAHS	South Metropolitan Area Health Service
TCA	Team Care Arrangement
WADS	Western Australian Diabetes Strategy 1999
WACHS	Western Australian Country Health Service
WAHPSF	WA Health Promotion Strategic Framework 2007-2011



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## APPENDICES

### Appendix 1: Workforce

#### A. Endocrinologists, Diabetologists

RACP trainees in adult endocrinology undergo three years of advanced training after four years of basic physician training. At present, there are three training positions (one each at SCGH, RPH and FH). There are no funded training positions at PMH. The current shortage of clinical endocrinologists will be exacerbated by the need additional endocrinologists for general hospital, ambulatory, regional and rural services. Workforce shortages are aggravated by increasing feminisation, loss of some trainees to clinical biochemistry and other disciplines and inadequate Medicare rebates. It is essential that hospital outpatient clinics are maintained training purposes as well as for patient access, and that the number of trainees is not reduced in the reconfiguration of teaching hospitals. Measures are needed to increase the attractiveness of private practice in endocrinology and diabetes.

#### B. Diabetes Educators

Diabetes educators provide essential education services in individual and group sessions to enable patients to understand their diabetes, to learn self blood glucose monitoring and to make the lifestyle changes which are essential to prevention of diabetic complications. Some are mainly involved in community care of type 2 diabetes; others also have training and expertise in teaching and supervising insulin administration. Diabetes educators have a primary health qualification (predominantly in nursing and dietetics) and have undertaken additional specialist training to expand their area of practice.

Credentialed Diabetes Educators (CDEs) are diabetes educators who have completed further training at Curtin University or one of four other courses accredited by the Australian Diabetes Educators Association (ADEA) nationwide. Continuing professional development is required for a three yearly credentialing process. Most CDEs work in teaching hospitals, general hospitals or community based services. CDEs are able to register patients for the NDSS and provide reimbursable diabetes education services as part of GP care plans under the Medicare Allied Health and Dental initiative. However, few CDEs are providing services under this initiative.

About 50% (65 of 130) of the Western Australian ADEA membership are CDE's. Curtin University has moved to two enrolments each year to meet the demand for clinical placement positions.

Nurse practitioner programs have been established at Curtin and Edith Cowan Universities. One diabetes nurse practitioner candidate has completed training



and two have started training. Additional work is needed to define the role and scope of nurse practitioners in diabetes management, and to overcome barriers to employment in roles that maximise the effectiveness of current and future diabetes nurse practitioners. It is envisaged that diabetes educators and diabetes nurse practitioners will take increasing role in diabetes management in the future.

Diabetes educators are employed by Area Health Services, Population Health, Commonwealth via GP Divisions and HACC funding of Silver Chain and by Diabetes Australia.

### C. Dietitians

Graduates of Curtin University's degree course in nutrition proceed to a graduate diploma in dietetics to become a dietician. Some also undertake the Graduate Diploma in Diabetes Education to become CDE's. The small number of dietetic graduates each year may not be sufficient for the needs of the large number of people with diabetes. Edith Cowan University is establishing a new dietetics course.

### D. Podiatrists

Podiatrists play a crucial role in prevention, early detection and management of chronic foot ulceration and other diabetes related foot problems. High-level evidence confirms the effectiveness of podiatry in early and advanced diabetic foot disease.

There are a number of critical workforce issues facing podiatry at present. The Curtin University degree program has been terminated and the last cohort of graduates completed training in 2005. UWA commenced a new four-year degree in 2006. However there is a gap of four years in which no graduates will be produced. This will exacerbate the long-standing difficulty in recruiting podiatrists to WA.

There are currently no formal training programs in diabetes specialisation for podiatrists. At present the only indicator of a podiatrist's experience in diabetes is the type of previous employment. Skills and knowledge in diabetes management are largely acquired through teaching hospital and other public sector experience. The new UWA program will offer a two year masters degree in podiatric medicine which will incorporate a diabetes stream.

RPH has initiated a podiatry internship year to provide supervised training for graduates interested in gaining experience in diabetes and high-risk foot management. The internship program is split between RPH and the NMAHS Ambulatory Care Diabetes program, providing the intern with experience in both the tertiary and community sector.



## **E. Physiotherapists**

Physiotherapy has a valuable role in the prevention and management of diabetes. Physiotherapists have knowledge and skills in assessment and clinical decision making, and are able to treat people with all types of diabetes across all ages. Physiotherapists currently work as part of multidisciplinary teams in hospital and community settings.

Physiotherapists are currently involved in a number of ways in the proposed diabetes model of care. These include health promotion, prevention of disease development in at risk groups and in the rehabilitation of patients with diabetes and co-morbidities. In addition to expertise in exercise assessment and prescription, physiotherapists address mobility and quality of life-problems associated with diabetes, such as vascular complications, peripheral neuropathies, disorders of sensation and balance, and musculoskeletal problems. Physiotherapists modify treatment plans based on continual evaluation of signs, symptoms, co-morbidities and therapy outcomes, and tailor interventions to meet the needs of individuals with diabetes.

Physiotherapists recognise the special needs of the Aboriginal population, and contribute to services in rural and remote health services through diabetes exercise promotion, prescription and rehabilitation in these areas where these services are currently under-resourced.

## **F. Exercise Physiologists**

Exercise Physiologists are highly qualified to design and deliver clinical exercise interventions for the management of diabetes and other chronic diseases. They are also trained in preventing the onset of disease for those at risk, and in providing post-acute exercise rehabilitation to improve health outcomes and reduce health care costs. Exercise physiologists are able to provide a supportive and individualised educational experience that motivates patients for long-term change. This includes the provision of health-behaviour change counselling and exercise adoption strategies utilising the principles of self-management. Exercise Physiology services may be delivered as part of an episode of hospital care, substitute for hospital care, or to prevent hospitalisation.

## **G. Practice Nurses**

Practice nurses are ideally placed to coordinate care and manage register/recall systems in general practice. Practice nurses can also contribute to patient education, facilitate adherence to treatment and assist in patient assessment. It is estimated that approximately 40-50% of Australian general practices employ practice nurse/s. The precise number of practice nurses in WA is not currently known. A national initiative is underway to support general



practices in employing practice nurses. There is a pressing need for state and national standards for education and training of practice nurses.

#### **H. Aboriginal Health Workers**

Aboriginal Health Workers play a vital role in prevention and management of diabetes in Aboriginal people, and should be included in multidisciplinary diabetes management teams and chronic disease management programs that engage with Aboriginal people.

#### **I. Ophthalmology, optometry**

At least two yearly screening of all diabetic patients by ophthalmologists or specifically trained optometrists is essential for early detection and management of diabetic retinopathy and other eye problems. The RPH Department of Ophthalmology provides clinical placements and updates for optometrists who wish to register with their professional body as competent retinal screeners.

#### **J. Psychologists, social workers**

Psychologists and social workers are needed in multidisciplinary diabetes management teams. Adjustment to the disease, behaviour change and freedom from anxiety and depression are essential components of effective diabetes management.



Delivering a **Healthy WA**

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