1 Introduction to Diabetes

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1.1 Incidence and Prevalence of Diabetes

The dramatic increase in the incidence and prevalence of type 2 diabetes and obesity is an alarming health concern. Despite increased awareness of the value of eating a healthy diet and undertaking regular physical activity, the incidence of type 2 diabetes has not been reduced. In fact, diabetes is a serious and growing global health problem. The Centre for Disease Control and Prevention (2006) described diabetes as an 'epidemic of our time that threatens to spiral out of control unless early, focused preventative actions are taken'. The challenge for health professionals and governments encompasses economic, social, and health planning in developed nations as well as in newly developed or developing countries, irrespective of culture or location.

Worldwide, the number of people with diabetes has tripled since 1985 (*Medical and Health Annual Encyclopaedia Britannica*, 1999), which supports earlier predictions of the global epidemic nature of diabetes in the first quarter of the twenty-first century. Type 2 diabetes is among the top ten leading causes of death in Westernised societies (Moutet *et al*. 1990). The number of people with type 2 diabetes throughout the world is expected to double by 2030 according to a recent study carried out by the WHO in collaboration with universities in Scotland, Denmark and Australia (Wild *et al*. 2004). Type 2 diabetes represents a huge challenge because of the total number of diagnosed cases as well as those at potential risk. It is expected to exceed 220 million people worldwide by 2010, thus doubling in 10 years.

Currently, at least 15.7 million adults in the United States, >8 per cent of the adult population, have diabetes and the incidence is outpacing population growth (ADA Position Statement 2006). In addition, American children as young as 7 and 8 show many of the signs of insulin resistance syndrome (IRS) related to early onset obesity (Freedman and Dietz 1999). Type 2 diabetes and its complications now claim 300,000 lives in the United States each year, incurring expenses of over $130 billion to the health-care system. Wild *et al*. (2004) projected the number of Americans diagnosed with diabetes would reach 29 million by 2050.

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Besides the mortality associated with diabetes, there are high health costs and disease burden to individuals resulting from the long-term complications and the unremitting nature of diabetes self-care. Complications can negatively impact on the individual's quality of life and mental health, see Chapter 7.

The International Diabetes Institute (IDI) predicted diabetes would affect 1.5 million Australians by the year 2010 primarily due to the increasingly overweight and physically inactive population and the cultural mix that includes several cultural groups known to be at high risk of developing type 2 diabetes. Estimates from a national survey, the Australian Diabetes and Obesity and Lifestyle Study (AusDiab) undertaken in 1999–2000, show Australia is quickly approaching one million people with diagnosed type 2 diabetes, approximately 7.5 per cent of the Australian population (Dunstan *et al*. 2002). AusDiab shows the following:

- An estimated 7.5 per cent of the population (938,700 Australians) aged > 25 have type 2 diabetes.
- Type 2 diabetes affects 8.0 per cent of Australian males, 7.0 per cent of Australian females and approximately 50 per cent of these are not aware they have diabetes. The increase in prevalence is occurring faster and earlier among males than females.
- The prevalence increases with increasing age, from 0.3 per cent among people aged between 25–34 to 23.7 per cent among those over 75.
- In eight years from 1990–1998, type 2 diabetes increased by 70 per cent in the 30–39 year age group, which demonstrated an increased incidence in younger people.
- 16.1 per cent of the population has either impaired glucose tolerance or impaired fasting glucose, known risk factors for diabetes.

1.2 Overview of Diabetes

Diabetes mellitus is a serious, chronic, currently incurable disease that manifests in several forms, the most common of which are type 1 and type 2 diabetes and gestational diabetes. It is primarily a disorder of carbohydrate, protein and fat metabolism arising from a lack of or resistance to insulin. The common metabolic consequence of untreated diabetes, regardless of type, is persistent hyperglycaemia and frequently hyperlipidaemia, which reflect cellular inability to ultilise glucose efficiently as an energy source. Various metabolic derangements occur as a consequence of the inability to utilise glucose and result in the classic symptoms of diabetes and the acute metabolic consequences such as ketonaemia and metabolic acidosis and hyperosmolar states. In the longer term, metabolic changes and accompanying inflammation lead to complications such as coronary heart disease, stroke, kidney disease and neuropathy.

People with diabetes frequently consult complementary practitioners or self-initiate complementary therapies to manage diabetes and its physical and mental complications as well as other comorbidities and intercurrent illnesses. In addition,

they often use them in preventative health plans, see Chapter 2. Therefore, it is important to determine whether people with diabetes use complementary therapies and why they use them, rather than assuming it is only to control blood glucose.

Signs and symptoms of diabetes

Hyperglycaemia occurs as a result of the underlying metabolic abnormalities of glucose homeostasis and is responsible for the symptoms. The symptoms are usually pronounced in type 1 diabetes but may be absent in type 2:

- frequent urination – polyuria and/or nocturia and usually glycosuria;
- excessive often unquenchable thirst – polydipsia;
- lethargy;
- weight loss;
- frequent, and poorly resolving infections;
- visual changes.

Classification of diabetes

The classification of diabetes and diagnostic criteria were revised in 1997 in a partnership between the American Diabetes Association (ADA) and the World Health Organization (WHO). The terms type 1 and type 2 diabetes replaced insulin-dependent and non-insulin dependent diabetes respectively. Most countries subsequently adopted the revised classification by the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus in 1997. The main types of diabetes are:

- type 1, which is further divided into two forms:
  - immune-mediated diabetes that occurs as a consequence of autoimmune destruction of the insulin-producing beta cells of the pancreas;
  - idiopathic diabetes, which has no known aetiology.
- type 2, which is associated with relative insulin deficiency and insulin resistance;
- gestational diabetes, which occurs during pregnancy.

Impaired glucose homeostasis is a stage between normal glucose homeostasis and diabetes, and is a significant risk factor for cardiovascular disease. Two forms exist: impaired fasting glucose and impaired glucose tolerance. In these states the plasma glucose is higher than normal but lower than commonly accepted diagnostic criteria.

Other types listed in the 1977 classification include diabetes associated with other disease processes such as endocrine disorders (Cushing's disease, acromegaly), and pancreatic diseases (cancer, pancreatitis), and drug- or chemical-induced diabetes, for example, steroid-induced diabetes. Genetic defects of beta cell function such as maturity Onset Diabetes of the Young (MODY) and of insulin action also occur. MODY should not be confused with type 2 diabetes occurring in young people as a consequence of the lack of adequate physical activity and obesity.

Diagnosis

Normal blood glucose ranges between ~3–6 mmol/L. Diabetes is diagnosed on the basis of presenting symptoms and/or elevated blood glucose levels. Where symptoms are not present, abnormal fasting blood glucose (>7 mmol/L) needs to be demonstrated on at least two occasions. When symptoms are present, an elevated blood glucose level is usually diagnostic. Elevated urine glucose is no longer an accepted diagnostic criteria for diagnosing diabetes.

In some cases, an oral glucose tolerance (OGTT) test may be necessary, for example, equivocal random blood glucose levels and a strong family history of diabetes especially during pregnancy. OGTT must be performed under test conditions and not undertaken when the individual is acutely ill, uraemic, in the postoperative period, or when the individual has been immobile for more than 48 hours. Usually a 75 g glucose load is used and the diagnosis is determined on the 2-hour glucose level. The diagnostic criteria are shown in Table 1.1.

Type 1 diabetes

Type 1 diabetes culminates in metabolic derangements and the classic symptoms, which occur as a result of progressive insulin deficiency, which usually develops over a long prodromal stage during which the beta cells of the pancreas are gradually destroyed. Type 1 accounts for between 7–10 per cent of diagnosed cases of diabetes. The most common cause is autoimmune pancreatic islet cell destruction. The basis of the destruction has been the subject of a great deal of research (the search for a cure).

The aetiology appears to be multifactorial. Associations between viral illnesses and nutritional intake of foods such as milk and potatoes have been noted and investigated as causes. However, the association between these potential causal factors is relatively weak, difficult to reproduce, and complicated by many

Table 1.1 Criteria for diagnosing diabetes based on World Health Organization guidelines. Fasting plasma glucose is preferred but all three tests are used. The levels shown are venous plasma glucose levels. Capillary blood glucose is ~10–15 per cent higher than venous blood. Diagnosis of diabetes is not usually made on the basis of capillary blood or urine glucose tests.

Diabetes stage	Fasting plasma glucose in mmol/L	Random plasma glucose in mmol/L	Oral glucose tolerance test in mmol/L at 2-hours
Normal	<6.1		<7.8
Impaired glucose tolerance	Impaired fasting glucose >6.1 and <7.		>7.8 and <11.1
Diabetes	>7	>11.1 and symptoms	>11.1

confounders (Gale 2005). Recent epidemiological research suggests the rate of progression of the beta cell destruction may be a significant factor in the age at onset of type 1 diabetes ('accelerator hypothesis'). Higher body mass index (BMI) was associated with younger age of onset of type 1 diabetes in a large cohort (n = 9248) of German and Austrian children (Knerr *et al*. 2005). Thus, weight gain may be a risk factor for early onset of both type 1 and type 2 diabetes.

The onset of type 1 diabetes commonly occurs in childhood and adolescence but can occur in adults. Type 1 can also present for the first time in older people, however, the onset may be slower and the symptoms less pronounced, which delays diagnosis and treatment. Type 1 also occurs in a small number of people after pancreatic trauma or pancreatitis. Insulin is required from diagnosis to replace the lack of insulin.

Type 2 diabetes

The majority of people with diabetes have type 2, which is due to the inability of insulin to maintain glucose homeostasis (insulin resistance) even in the presence of high levels of insulin (hyperinsulinaemia), which is often a feature in the early stages. Insulin secretion occurs in two phases: an initial spike when glucose enters the blood stream and stimulates insulin release, the first phase, then a second less pronounced spike, the second phase. Loss of the first phase often occurs in type 2 diabetes but the beta cells respond to insulin secretagogues such as sulphonylureas (Dornhorst 2001).

Type 2 diabetes is associated with elevated fasting blood glucose, and reduced glucose utilisation post prandially. Type 2 diabetes develops as a result of a genetic predisposition and environmental factors (Turner and Clapham 1998). Significantly, type 2 diabetes is often 'silent' and is diagnosed when the individual presents with a diabetes-related complication such as heart disease. The causes of type 2 diabetes are related to changes in cellular responses to what would otherwise be adequate levels of insulin (insulin resistance). The areas of current research include changes in metabolic hormones associated with or which occur as a consequence of obesity (Vettor *et al*. 2001).

Type 2 diabetes is insidious and associated with progressive beta cell failure, which means a majority of people with type 2 may eventually require insulin. The majority of people with type 2 diabetes are over the age of 55 years, have central (truncal/abdominal) obesity, and a sedentary lifestyle. People over 45 years with a genetic history of diabetes in a close family member, or current hypertension or heart disease are most at risk of type 2 diabetes. Table 1.2 shows a simple self-administered risk factor check used by Diabetes Australia in diabetes awareness campaigns. However, in many countries, type 2 diabetes is starting to occur at an earlier age and appears to be associated with the rise of obesity in children and young adults.

Table 1.2 Type 2 Diabetes Tick Test (Reproduced with kind permission from Diabetes Australia www.diabetesaustralia.com.au). This is a self-administered health prevention initiative of Diabetes Australia. If people tick more than one positive response they are advised to discuss their health with their doctor to determine whether they have type 2 diabetes.

• I am over 45 and have high blood pressure
• I am over 45 and am overweight
• I am over 45 and one or more members of my family has diabetes
• I am over 55
• I have heart disease or have had a heart attack
• I had high blood sugar levels while I was pregnant (gestational diabetes)
• I have had a borderline high blood sugar test
• I have polycystic ovary syndrome and am overweight
• I am over 35 and am a Pacific Islander or from an Asian cultural background or from the Indian sub-continent

Insulin resistance

Insulin resistance is a pre-diabetic stage known variously as the metabolic syndrome, syndrome X, syndrome X and the insulin resistance syndrome (IRS). Insulin resistance and hyperinsulinaemia improve with increased activity and weight loss. The classic features of IRS are:

- central obesity: increased body mass index and waist hip ratio;
- hyperinsulinaemia;
- impaired utilisation of glucose;
- reduced glucose storage as glycogen;
- elevated fasting and post-prandial blood glucose;
- hyperlipidaemia, which inhibits insulin signalling and reduces intracellular glucose transport;
- reduced fibrinolysis;
- hypertension;
- endothelial dysfunction;
- inflammatory changes that affect the insulin receptor activity;
- systematic low grade chronic infection;
- athersclerosis.

Central obesity is a significant risk factor for cardiovascular disease, and weight gain after young adulthood represents an additional risk independent of initial weight (Hubert *et al*. 1983). Low oestrogen levels after menopause in women with diabetes may compound weight gain, make it more difficult to exercise and increase the cardiovascular risk (Poehlman and Tchernof 1998). A recent study indicates coffee consumption improves glucose-tolerance and reduces the risk of type 2 diabetes but the specific components of coffee exerting the glucose-lowering effect are unknown but are independent of the coffee preparation method but the clinical implications are unclear (*Diabetes Care* 2006, 29: 398–403).

Gestational diabetes

Gestational diabetes refers to IGT occurring during pregnancy, affecting approximately 3 per cent of pregnancies. The exact cause remains unknown but insulin resistance due to placental hormones has been suggested. Current recommendations are that all pregnant women should be screened between 24 and 28 weeks gestation followed by an OGTT if the screening test is abnormal. Opinions vary about whether a 50 g or 75 g glucose load should be used. If the blood glucose cannot be controlled by diet and activity, insulin will be needed.

The aim is to maintain the glucose in the normal range to reduce the risks of hyperglycaemia to the mother and baby. These include macrosomia (large infant body weight) complicating labour and necessitating caesarian section, respiratory distress in the newborn and neonatal hypoglycaemia. The blood glucose usually returns to normal after the baby is born but ~40 per cent of women develop type 2 diabetes in later life. Thus a follow-up OGGT is recommended 6–8 weeks after delivery and regular screening thereafter to enable early detection and treatment of diabetes.

1.3 Management Strategies

The basis of managing type 2 diabetes is by improving metabolic control through physical activity and dietary changes. However, glucose-lowering medicines, and, if necessary, insulin, are prescribed as the disease advances. Commonly used glucose-lowering medicines include:

- sulphonylureas that enhance insulin secretion from beta cells;
- meglitinides that augment insulin secretion;
- biguanides that inhibit hepatic glucose production and increase glucose uptake in muscles and reduce triglycerides and LDL cholesterol levels;
- thiazolidinediones (TZD) that improve insulin sensitivity in muscle and to some extent in the liver and reduce triglyceride levels;
- alpha-glucosidase inhibitors that inhibit the action of glucose oxidase in the gut, thereby delaying glucose absorption into the blood stream;
- insulin, which comes in several forms: rapid acting, short acting, intermediate acting, and long acting. The rapid or short-acting insulins are often combined with longer-acting insulins to achieve 24-hour glycaemic control. Insulin is administered by subcutaneous injection using a range of devices. Insulin pumps, which can be programmed to continuously deliver a small amount of insulin into the subcutaneous tissue (basal) and bolus doses with meals, are becoming more widely used but they are expensive. Inhaled insulin is emerging as an alternative to short acting insulin for some people. During surgery and acute illness, for example, ketoacidosis (DKA), clear short-acting insulin is often administered intravenously.

Sometimes combinations of glucose-lowering medicines are required. In addition, a range of other medicines are needed to manage diabetes complications,

for example, antihypertensive and lipid-lowering agents, and comorbidities such as arthritis, and intercurrent illnesses. Thus, the medicine regimen can be complicated and should be reviewed on a regular basis.

In some cases insulin and glucose-lowering medicines are used together in type 2 diabetes. Insulin is also required when women with type 2 diabetes become pregnant and often when type 2 diabetes develops following gestational diabetes later in life. Insulin is sometimes used on a temporary basis in type 2 diabetes, for example, during intercurrent illness or surgery and managing hyperosmolar states.

Glucose-lowering medicines can have significant side effects, for example:

- Hypoglycaemia (sulphonylureas and TZDs). Hypoglycaemia increases the risk of trauma, falls and affects mental health and quality of life.
- Weight gain (sulphonylureas and TZDs).
- Gastrointestinal symptoms such as bloating and nausea (biguanides and Alpha-glucosidase inhibitors).
- Lactic acidosis (Metformin) is more likely in patients with severe renal impairment (GFR $<$ 40 ml/minute), myocardial infarction, and intercurrent illnesses that cause hypoxia. Metformin should not be used when these conditions are present (Holstein and Stumvoll 2005). Metformin is also associated with vitamin B_1 malabsorption (Bauman *et al*. 2000).
- Liver toxicity: the early forms of TZDs were associated with liver failure but it rarely occurs with newer agents. The liver function is usually monitored initially when TZDs are commenced.

1.4 Management Targets and Regimens

The generally accepted metabolic management targets are shown in Table 1.3. The frequency of testing depends on the specific parameter. For example HbA_{1c} is usually monitored at three monthly intervals but blood pressure should be checked at each consultation. Fasting lipids, microalbuminuria, foot assessment to detect peripheral neuropathy and vasculopathy, and eye examinations should be undertaken at least yearly but may be undertaken less or more frequently depending on the age of the individual, their risk factors for inadequate metabolic control, and the results of previous examinations and investigations.

In addition to these complication monitoring processes, people with diabetes undertake regular blood glucose self-monitoring, test for ketones during illness and are generally responsible for their care, as already indicated. Self-care is hard work and initial and ongoing diabetes education and support are essential, see Chapter 7. Although assessing mental health and quality of life, and undertaking structured medication reviews that include complementary medicines are not usually included in management regimens, they are important and affect metabolic outcomes. Therefore, these issues should be included in diabetes annual reviews. Recently, mental health screening questions were included in the Australian National Diabetes Information Audit and Benchmarking tool, (ANDIAB).

Table 1.3 Current metabolic targets that need to be monitored on a regular basis. (National Health and Medical Research Council 2004). These targets may vary around the world and need to be adjusted to individual needs and especially for children and older people.

Management parameter	Target
Blood glucose	Fasting 4–6 mmol/L
HbA_{1c}	$\leq$7 per cent
Lipids	
• Cholesterol	• $<$4 mmol/L
• LDL	• $<$2.5 mmol/L
• HDL	• $>$1.0 mmol/L
• Triglycerides	• $<$2.0 mmol/L
Blood pressure	$<$130/80 mm Hg
Weight BMI	$\leq 25\,kg/m^2$ where practical
Urinary albumin excretion	$<20\,\mu g$/min in a timed overnight collection or $<$20 mg/L in a spot collection. Albumin/creatinine ratio: women $<$3.5 mg/mmol and men 2.5 mg/mmol
Physical activity	At least 30 minutes walking or similar activity at least 5 days/week

The general management aims are to do the following:

- Achieve metabolic targets within the capacity of the individual without producing unnecessary hypoglycaemia or other adverse events. Hypoglycaemia causes a considerable amount of distress to people with diabetes and their families and can put the individual and other people at significant risk. It is not unusual for people to run their blood glucose high to avoid hypoglycaemia. Health professionals often do not appreciate or under-rate the physical and psychological effects of hypoglycaemia or the level of fear it engenders.
- Control hyperglycaemic symptoms and symptoms associated with complications such as pain.
- Follow a regular healthy diet and exercise plan.
- Stop smoking, which contributes to vascular risk factors as well as many cancers.
- Support the individual to set achievable management goals to maintain quality of life.
- Undertake regular complication risk assessment and treatment when indicated.

1.5 Short-term Complications

The short-term complications of diabetes include:

- ketoacidosis (DKA) due to insufficient insulin, which primarily occurs in type 1 diabetes due to intercurrent illnesses but can occur in type 2 during serious illnesses such as septicaemia or myocardial infarction. It may be the presenting feature at the initial diagnosis of type 1 diabetes.

- hyperglycaemic hyperosmolar non-ketotic states (HONK), which often occur in older people during illness. HONK also occurs in diagnosed type 2 diabetes.
- intercurrent illnesses such as colds and flu, which predispose individuals to DKA and HONK;
- hypoglycaemia in insulin-treated individuals and those taking oral glucose-lowering agents.

1.6 Long-term Complications

Two landmark studies, the Diabetes Control and Complications Trial (DCCT) in type I (1993) and the United Kingdom Prospective Diabetes Study (UKPDS) (1998) in type 2, demonstrated the importance of controlling blood glucose and blood pressure respectively, to reduce the complications of diabetes. The complications of all forms of diabetes include small blood vessel damage (microangiography), which particularly affects the eyes, kidneys and neural tissue. Common manifestations include retinopathy and nephropathy. Large blood vessel damage (macroangiography) and dyslipidaemia are significantly associated with increased mortality from coronary diseases, peripheral vascular disease, and stroke.

Table 1.4 Common long-term complications of diabetes.

Condition	Complication
Nephropathy	Diabetic nephropathy Chronic renal failure End stage renal disease requiring dialysis Affects medicine excretion
Retinopathy	Diabetic retinopathy Glaucoma Cataract
Neuropathy (peripheral and autonomic)	Peripheral: Neuropathic pain, which affects quality of life Foot pathology such as changed gait that predisposes the individual to trauma, ulcers, amputation and fall Autonomic: Gastroparesis Atonic bladder Silent myocardial infarction Postural hypotension, which increases falls risk Erectile dysfunction
Cardiovascular disease	Coronary artery disease Cerebrovascular disease Peripheral vascular disease
Pregnancy-related complications	Birth defects Macrosomia Neonatal hypoglycaemia Interventions such as forceps and caesarian deliveries.

Myocardial infarction is often 'silent' (asymptomatic) in type 2 diabetes, which delays treatment and increases the associated morbidity and mortality. All people with diabetes should be treated as if they have known cardiovascular disease (Tabibiazar and Edelman 2003). The American Diabetes Association (ADA) recommends including cardiac stress tests when the individual has two or more cardiovascular risk factors as well as for people with microalbuminuria, and sedentary people about to commence an exercise programme (ADA 2006). Table 1.4 shows the common the long-term complications associated with diabetes.

The long-term complications are associated with prolonged hyperglycaemia measured by HbA_{1c} (glycosylated haemoglobin) and hypertension and the associated abnormalities (Diabetes Control and Complications Trial 1993; United Kingdom Prospective Study 1998). The current HbA_{1c} target is <7.0 per cent. The causes of long-standing hyperglycaemia are multifactorial and include genetic predisposition, free radical oxidative damage, protein glycosylation, and endothelial changes. In addition, lower socio-economic status, psychological issues that lead to lack of motivation, emotional distress, poor eating habits and depression, inadequate knowledge on the part of the person with diabetes and the health professionals caring for them, have been implicated (DeVries *et al*. 2004).

1.7 Psychological Aspects

The diagnosis of diabetes affects people in many different ways depending on their age, knowledge and beliefs about diabetes, locus of control, available support, culture and the knowledge, beliefs and attitudes of the health professionals who care for them, see Chapter 7. Many people go through an initial grieving stage as they come to terms with the diagnosis and may re-grieve when they develop a complication.

Self-care is necessary and expected with the availability of modern technological devices to test blood glucose and blood ketones. The individual is also expected to problem-solve and adjust their treatment to accommodate fluctuations in these parameters. Inadequate self-care is associated with poorer health outcomes, more frequent admissions to emergency departments or hospital, low self-esteem, and increases the risk of short- and long-term complications (Cieckanowski *et al*. 2000).

Depression is common and is associated with the burden of diabetes, which puts a strain on relationships, and can create shock and guilt. The stigma of having diabetes is still an issue in many social circumstances, as are uncertainty about the future, loss of control, and past negative experiences with health professionals (Caven *et al*. 2001). Signs and symptoms of depression in the person with diabetes include disinterest, reduced confidence, lack of energy, changes in sleep and eating patterns, and self-neglect, including diabetes self-care. These negative psychosocial factors and symptoms can result in hyperglycaemia, which further lowers mood.

1.8 Diabetes Management Requires Integrated Approaches

The sobering incidence and prevalence data previously discussed emphasise the fact that a best practice approach to managing diabetes involves addressing the needs of people with diabetes and those of health professionals in an integrated manner. In addition, diabetes management is regarded as requiring a team approach that includes relevant health professionals and places the person with diabetes in a central role. In other words, provide holistic care. In this context, 'holism' refers to providing care in the context of the whole person and respecting the fact that each person is a unique individual (Vickers 1996).

A philosophical basis of many complementary approaches is the belief that 'the body has the capacity to heal itself' and the role of health professionals is to support the healing process. Such a philosophy is very close to the emerging modern diabetes person-centred management philosophy.

1.9 People with Diabetes' Needs, Capacities and Resources

At the centre of integrated management is the person with diabetes making choices about their health and informed decisions about the interventions they choose to use. Research shows that people with chronic illnesses often choose to use both conventional and complementary medicine (Astin 1998; Bausell *et al*. 2001; Pettigrew *et al*. 2004). The reasons for using complementary therapies and the frequency of use are discussed in Chapter 2.

The research emphasises the fact that people with chronic illnesses, including diabetes, do not share the intellectual dichotomy that often exists in conventional health professional training. They appreciate the ability to make choices and adapt both systems to their lives. The choice of using complementary medicine is often based on the belief that it is 'more congruent with their own values, beliefs, and philosophical orientations toward health and life' (Afridi and Khan 2003).

The general public, including people with diabetes, is increasingly knowledgeable about health issues and available health-care choices and has high expectations of health professionals and services. However, they may be overly optimistic about the safety of many therapies, under-estimate or not be informed about the risks, or not attribute unwanted effects to treatments (Ernst 1996).

1.10 Health Professionals' Needs

There is a need to establish professional education programmes that encompass all aspects of diabetes and its manifest complications using sound evidence-based principles. Integrating these twin aspects in a therapeutic process has shown that people who are assisted to develop networks of trust, gain access to preventive education, and then use appropriate interventions based on this knowledge, have better disease-related outcomes such as improved HBA_{1c} and significantly lower complication rates (Afridi and Khan 2003). The challenge for health professionals

is to facilitate the process of developing team care and 'networks of trust'. Until recently, most people took the advice of non-professional sources such as friends, and Internet sites and the media; fewer than 50 per cent seek advice from a health professional (Giveon *et al*. 2003; Lanski *et al*. 2003).

Some of the challenges for health professionals that have emerged in the literature include: Patients not asking about complementary therapy use; patients receiving or perceiving negative responses from conventional practitioners when they disclose their complementary therapy use; and lack of knowledge about complementary therapies (conventional practitioners) and about conventional care (complementary practitioners) (Giveon *et al*. 2003), see Chapter 2.

Significantly, lack of communication between practitioners from the two approaches can lead to confusion and increases the risk of adverse outcomes. However, these factors are changing, especially in primary care settings where practitioners are often exposed to questions related to complementary therapies and their usefulness, and where there is an increasing number of referrals to complementary practitioners and vice versa (Crock *et al*. 1999; Hall and Giles-Conti 2000; Van Haselen *et al*. 2004). Likewise, there is an increasing amount of credible research and literature that can help health professionals negotiate the complex and diverse field of 'complementary therapies' and identify their role and scope in diabetes care, see Chapter 4. It is no longer appropriate to consider conventional and complementary care as two separate paradigms (Ernst 1996).

1.11 Integration – Is It Possible?

Chapter 4 discusses issues surrounding integrating the two approaches and suggests some strategies for combining conventional and complementary approaches. Thus, in summary, there is evidence that people with diabetes achieve better outcomes if they are well educated about their diabetes, its management, complications, and monitoring, including and encompassing complementary therapies. A significant improvement in health professional education is required, and could include non-judgemental history taking related to complementary therapies, education about common complementary modalities, and how to access relevant information. Conversely, complementary practitioners require similar education about conventional management approaches. Practice guidelines have also been suggested as a way to assist safe integration (Yeh *et al*. 2002; Mehrotra *et al*. 2004; Giveon *et al*. 2004).

This book is one attempt to address some of the educational needs of health professionals caring for people with diabetes in the twenty-first century who are working within a changing society where people with diabetes no longer want to be defined by disease-focused reductionistic terms such as 'diabetics', or descriptions such as the 'diabetic foot'. These practitioners *will* be sharing patients with complementary practitioners, which leads to questions about the 'sanctity, integrity and power of the therapeutic relationship' such that 'the medical profession can no longer just be the possessor of knowledge.' In fact, this book is

a move towards the pluralism, harmonisation, and integration desired by Lewith and Bensoussan in the *Medical Journal of Australia* (Bensonssan *et al*. 2004).

Professor Cohen in the same journal outlined the practical nature of the process of integration. He suggested most general practitioners have patients with chronic illness who could benefit from the services of complementary practitioners and virtually all complementary practitioners have patients who require access to mainstream diagnosis and therapy. Collaboration requires shared respect, trust, and education. Importantly, the dangers of not integrating care include delaying or depriving people of safe and effective management and increase the potential for harmful interactions (Cohen 2004).

1.12 Complementary Therapies

Not all Complementary and alternative medicine (CAM) practitioners agree on the principles of diseases but most encompass three ideals: (1) treatment should be as natural as possible; (2) it should be holistic; and (3) it should promote general well-being. Most ascribe to vitalism in some way, for example, terms such as vital force, life energy, and the body's ability to heal itself. Some complementary therapies are more effective and safer than others.

Until recently there has been limited quality research into complementary therapies, because, as in other areas, funding is difficult to access, research expertise and research mentors are lacking, and there is limited infrastructure to support research. A great deal of the available research is difficult to interpret due to methodological flaws, poor reporting, and a great deal is not conducted in the manner the particular therapy is practised (Vickers 1996). However, many complementary therapies have a long history of safe traditional use that provides a firm foundation for future research. There is no doubt there are complementary practitioners with idealistic, extremist views, just as there are conventional practitioners who are sceptical about complementary therapies (Bratman 1997).

1.13 Summary

The book encompasses the principle that people with diabetes are essential members of the health care team who require support to achieve better health outcomes for an increasingly prevalent global epidemic. The book provides readers with a definition of complementary and alternative medicine and discusses some of the evidence to support the integration of some complementary therapies into modern diabetes management. The book provides an in-depth insight into commonly used complementary therapies and their application in the management of people with diabetes. By exploring and understanding such accumulated knowledge, health professionals may be able to provide relevant information to help people make informed choices that match their life expectations, not just our more disease-focused management regimens.

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