

# *Care of People with Diabetes: A Manual of Nursing Practice*

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## **Dedication**

This book is dedicated to all people with diabetes who may one day need nursing care, and to all nurses who care for them.





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# Foreword

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Worldwide, the prevalence of diabetes is increasing at an alarming rate and much of the care previously considered the domain of the medical practitioner will now need to be undertaken by nursing staff. Hence, it is essential that nurses, whatever the context of their working environment, develop a sound clinical understanding of diabetes management.

This remarkably comprehensive book reflects the depth of knowledge and experience of its author and will assist nurses in the process of diabetes management. The text encompasses many areas of diabetic care and bridges the gap between traditional nursing texts and diabetes medical textbooks. It will be valuable to nurses working on the periphery of diabetes in a hospital or community environment as well as to nurses who have developed a career in diabetes care. The author provides carefully detailed aspects of clinical care such as the caution required when using radio-contrast medium in people with diabetes and renal impairment while also including information about the use of complementary therapies for diabetes management.

The diagnosis of diabetes, whether it is type 1 or type 2, has a significant impact on the life of the person and their family. Living with diabetes is not easy and requires considerable dedication and commitment to adapt to the life-long regimen imposed by this chronic disease. While it is inevitable that nurses will take on an increased clinical role, it is also important that they do not forget the fundamental purpose of nursing which is to care for patients. Nursing staff must recognise not only the medical aspects of diabetes but also its psychosocial impact and thus not be judgemental when caring for the patient with diabetes. This book emphasises the need for a holistic approach and provides insight into the many physiological and psychological facets of diabetes care.

It is with much delight that I write the foreword to this excellent textbook written by my friend and colleague Dr Trisha Dunning. Her vast experience in diabetes education, clinical management and research is obvious. I wholeheartedly recommend this text to all health professionals whether working directly in, or on, the fringe of diabetes. This textbook should be considered essential reading for diabetes management.

Marg McGill MSc (Med)  
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Diabetes Education*





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# Preface

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## Background to the second edition

It has been 30 years since I trained as a nurse in the days of Fehling's solution to test for urine glucose and glass reusable insulin syringes. My first exposure to diabetes was the complete devastation of a school friend who developed diabetes during her first pregnancy. I had no intuitive flash to become a diabetes nurse specialist/diabetes educator – they did not exist. Diabetes itself was hardly considered. Today diabetes is the focus of my working and a great deal of my personal life.

Diabetes has come a long way too, since it was first described as *diabetes maigre* (bad prognosis) and *diabetes gros* (big diabetes). Science and technology have made major contributions to our understanding of the pathophysiology of diabetes and its complications, and to our management options, and have enabled people with diabetes to have autonomy over their disease.

The incidence of diabetes is increasing, particularly in the elderly. People are living longer and there is an increasing incidence of Type 2 diabetes in developing countries and depressed populations. There truly is a diabetes epidemic. The information presented in this Manual offers suggestions for the nursing management of people with diabetes. Where references exist, they are included to support the nursing care recommendations and as a framework for continuing education. A number of guidelines for managing diabetes exist, but most refer to medical management and primary and outpatient care, rather than nursing care in acute settings.

The nursing care described in this Manual has been partly extrapolated from these documents and is based on the clinical experience and knowledge gleaned over 17 years of practice in diabetes education and care and discussion with nursing colleagues.

The book was written to fill the gap between academia and clinical practice by providing easy-to-access information that can be directly applied in busy clinical situations. The purpose is to guide the practice of diabetes nursing and assist nurses to provide consistent care and achieve better outcomes for their patients with diabetes. The first edition was successful in meeting these goals.

A number of changes have occurred since the Manual was first published that require the information to be revised and updated. They include improvements in diabetes technology, understanding of the disease process and its complications and shifting the focus to empowering people with diabetes.

In particular, the results of the Diabetes Control and Complications Trial (DCCT 1993) and the United Kingdom Prospective Diabetes Study (UKPDS 1998) have had a significant impact on current diabetes management. In addition, the Australian *National Diabetes Strategy* (NDS) (Colagiuri *et al.* 1998) and the British *Diabetes National*

*Service Framework: Standards for Diabetes Services* (Department of Health 2001) define the standards of care in those countries. The NDS does not address nursing care or management in the acute setting. The British National Service Framework consists of 12 standards in nine areas due to come into operation in 2003. One standard refers to care of people with diabetes during a hospital admission.

For the past six years I have been privileged to be a member of the Victorian Nurses Care Awards, a committee that receives nominations from patients of nurses they consider to have demonstrated excellence in nursing practice. These nominations demonstrate that people value the 'art', or caring aspects of nursing practice, but also expect to be cared for by competent, knowledgeable nurses.

Almost all countries, especially the UK and Australia, are moving towards managing diabetes in primary care settings with integrated care programmes. This means that people with diabetes in hospital are likely to be sicker and require skilled nursing care. Because the incidence and prevalence of diabetes is increasing worldwide, most nurses can expect to care for a person with diabetes at some stage of their nursing career.

In order to address these issues, some chapters have required extensive revision, others very little. New chapters have been added, for example, on care of the elderly, to increase the relevance of the Manual to aged and community settings, and on complementary therapies, to reflect the increasing use of these therapies by the general public and nurses. References have been included that serve as the evidence base for the recommendations.

There is a growing trend to prefer the term 'people with diabetes' rather than 'diabetics' or 'patients'. The terms 'people with diabetes' and 'patients' are used interchangeably throughout the Manual, as appropriate to the particular reference. Most people, including people with diabetes, still regard people in hospital as patients.

A trend in some parts of the world, including Australia and the UK, is the development of the nurse practitioner role. Diabetes nurse specialists/diabetes educators will be one category of nurse practitioner. The nurse practitioner is an experienced advanced clinical nurse with an extended scope of practice that includes medication management, one component of which is prescribing. Diabetes educator nurse practitioners are likely to play a major role in diabetes care in the future and will be in an ideal position to support ward nurses.

It is my hope that the revised edition of the Manual will continue to contribute to the body of nursing knowledge about diabetes, and that it will be of assistance to nurses (and other health professionals) involved in the care of people with diabetes. I have endeavoured to make the information general and applicable to all nurses; I hope each person who reads the Manual will find something of value.

## Using the Manual

The nurse, more than any other member of the health team, is the person who interprets to the patient the care he must take of himself and his family. Her belief in the comprehensiveness of adequate care will influence the scope of her care beyond the treatment prescribed by the physician.

(Henderson 1966)

In spite of the age, and sexism, of this reference, the philosophy is still relevant today, especially given the rise of the nurse practitioner role and advanced nursing practice. Nursing is both an art and a science whose essence is caring. Nurses have a responsibility,

with other health professionals, for planning, implementing and evaluating the care given to patients under their care. Nurses function in a variety of settings and the components of the nurse's role varies according to the setting (hospital, community health centres, city or remote areas).

Nursing care is distinct from medical care, but nursing and medical care complement each other. Some nursing actions occur as a result of the medical orders, others are the basis on which the medical orders are formulated. It is of the utmost importance, then, that nurses have adequate knowledge about disease processes and their effect on individuals in order to provide optimal care.

People who have had diabetes for some time are often aware of omissions and poorly performed procedures relating to their care in hospital. In the case of people with diabetes, this is particularly true of blood glucose testing, and hypoglycaemia, management. A lack of trust in the staff, considerable anxiety and confusion about the correct method can result if nursing practice is not consistent with the teaching of the diabetes education team.

This Manual has been designed as a quick reference source for specific nursing actions needed in the care of people with diabetes mellitus to allow nursing care plans to be formulated quickly in busy situations and to provide references where more information can be found. A list of key points is given at the beginning of most chapters. Important information is referenced throughout the text. In addition, practice points based on research findings, and clinical observations based on personal experience are included.

Chapters are cross-referenced where appropriate. The pathophysiology and medical management of diabetes is discussed only briefly because it is more than adequately covered in other publications, see Appendix B.

The care outlined in this Manual does not negate the provision of basic general nursing care as indicated by the presenting condition, but focuses on the specific and extra needs of people with diabetes. The presence of diabetes will have physiological effects on the presenting condition if diabetes is not adequately controlled. A careful assessment of individual physical, psychological and spiritual needs should form the basis of all nursing care.

### *Practice point*

The procedure and policies of the employing institution should be followed. This Manual does not replace these documents.

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I am in debt to the librarians of St Vincent's Hospital, Sandra, Lorraine and Hilary, who are always interested in what I am doing, ask after progress, track down references for me and look forward to having a copy of the new edition in the library.

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I have learned a great deal about diabetes from the people with diabetes I teach and care for and their families. I thank them for the privilege of caring for them.

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The support and understanding of my family continue to be invaluable. My especial thanks and love go to my husband, John, who is still 'the wind beneath my wings'.

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## List of Abbreviations and Symbols

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↑	Increased
↓	Decreased
<	Less than
≥	Equal to, or greater than
>	Greater than
BG	Blood glucose
BMI	Body mass index
BP	Blood pressure
BUN	Blood urea nitrogen
CAPD	Continuous ambulatory peritoneal dialysis
CCF	Congestive cardiac failure
CCU	Coronary care unit
CSII	Continuous subcutaneous insulin infusion
DA	Diabetes Australia
DKA	Diabetic ketoacidosis
ECG	Electrocardiogram
EN	Enteral nutrition
FFA	Free fatty acids
HbA1c	Glycosylated haemoglobin
HM	Human insulin
HONK	Hyperosmolar non-ketotic coma
ICU	Intensive care unit
IV	Intravenous therapy lines
LFT	Liver function test
MODY	Maturity onset diabetes in the young
NDSS	National Diabetes Supply Scheme
OGTT	Oral glucose tolerance test
OHA	Oral hypoglycaemic agent
TPN	Total parenteral nutrition
TPR	Temperature, pulse and respiration
WHO	World Health Organisation

The words are used in full the first time they appear in the text. All abbreviations are widely accepted and recognised.



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## Chapter 1

# Diagnosis and Classification of Diabetes

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### 1.1 Key points

- Diabetes represents a considerable economic and social burden for the person with diabetes and the health system.
  - The classification of diabetes was revised by the American Diabetes Association in 1997 and adopted by the World Health Organisation in 1998. It was adopted in Australia and by Diabetes UK in 1999.
  - Type 2 diabetes is a progressive disease and complications are often present at diagnosis.
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### 1.2 What is diabetes mellitus?

Diabetes mellitus is a metabolic disorder in which the body's capacity to utilise glucose, fat and protein is disturbed due to insulin deficiency or insulin resistance. Both states lead to an elevated blood glucose concentration and glycosuria.

The body is unable to utilise glucose in the absence of insulin and draws on fats and proteins in an effort to supply fuel for energy. Carbohydrate is necessary for the complete metabolism of fats, however, and when carbohydrate metabolism is disordered fat metabolism is incomplete and intermediate products (ketone bodies) can accumulate in the blood leading to ketosis, especially in Type 1 diabetes. The protein breakdown in this situation leads to weight loss and weakness and contributes to the development of hyperglycaemia and lethargy.

There are different types of diabetes which have different underlying causal mechanisms and clinical presentation. In general, young people are insulin-deficient (Type 1 diabetes), while older people may have sufficient insulin secretion and plasma insulin levels but demonstrate resistance to its action (Type 2 diabetes). Type 2 diabetes is the most common, accounting for 85% of diagnosed cases; Type 1 accounts for 15% of diagnosed cases. N.B. Type 2 diabetes occurs in children and Type 1 diabetes occurs in the elderly.

### 1.3 Classification of diabetes

The American Diabetes Association (ADA) announced a revised diabetes classification system and diagnostic criteria in 1997. These revised data were a joint activity between

the ADA and the World Health Organisation (WHO). As part of the new classification the terms insulin-dependent diabetes (IDDM) and non-insulin-dependent diabetes (NIDDM) were replaced with Type 1 and Type 2 diabetes (Expert Committee on the Diagnosis and Classification of Diabetes Mellitus 1997).

- Type 1 diabetes has two forms:
  - Immune-mediated diabetes mellitus, which results from autoimmune destruction of the pancreatic beta cells;
  - Idiopathic diabetes mellitus refers to forms of the disease that have no known aetiologies.
- Type 2 diabetes mellitus refers to diseases associated with relative insulin deficiency and insulin resistance.
- Impaired glucose homeostasis, which is an intermediate metabolic stage between normal glucose homeostasis and diabetes. It is a significant risk factor for cardiovascular disease. There are two forms:
  - Impaired fasting glucose, where the fasting plasma glucose is higher than normal but lower than the diagnostic criteria;
  - Impaired glucose tolerance, where the plasma glucose is higher than normal and lower than the diagnostic criteria after a 75 gram glucose tolerance test, see 1.6.
- Gestational diabetes mellitus, diabetes occurring in pregnancy.
- Other specific types, which include diabetes caused by other identifiable disease processes:
  - Genetic defects of beta cell function such as MODY;
  - Genetic defects of insulin action;
  - Diseases of the exocrine pancreas such as cancer and pancreatitis;
  - Endocrine disorders such as Cushing's disease, and Acromegaly;
  - Drug or chemical induced diabetes.

Diabetes affects approximately 0.5 to > 10% of the population depending on the type of diabetes, age group and ethnic group. The incidence of diabetes is increasing, particularly in the older age group and in developing countries.

A recent study in Australia (Dunstan *et al.* 2000), indicates that 7.5% of people over 25 years and 16.8% of people over 65 have diabetes and a further 16.1% have impaired glucose tolerance. In the UK, an estimated 1.4 million people have diabetes (Audit Commission 2000). In both countries Type 2 is the most common type, accounting for 80–90% of cases.

## 1.4 Type 1 and Type 2 diabetes

### 1.4.1 Type 1 diabetes

Type 1 diabetes is a disease of absolute insulin deficiency that usually affects children and young adults but can occur in older people. It often presents with the so-called classic symptoms of diabetes mellitus:

- Polyuria
- Polydipsia
- Lethargy
- Weight loss.