

Quality Standards for Diabetes Care Toolkit

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The Quality Standards for Diabetes Care in New Zealand have drawn on the Quality Statements issued by the National Institute for Health and Care Excellence (NICE). Where relevant, the NICE statements and assessment criteria have been utilised to inform the content of the information contained in this toolkit.

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This toolkit is subject to change as knowledge of diabetes care evolves and new information becomes available. Feedback is welcome on what could be added, changed or removed. This toolkit will be reviewed and updated by section 2016–2017.

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Quality standards for diabetes care

These standards should be considered when planning your local service delivery. They provide guidance for clinical quality service planning and implementation of equitable and comprehensive patient-centred care – scaled to local diabetes prevalence. They should be read alongside the NZ Guidelines Group (NZGG) and other guidelines which highlight specific clinical expectations. These standards are specific to people with diabetes – those identified with pre-diabetes should be managed in accordance with the specific advice provided by the Ministry of Health (2013a).

The Standards are arranged into five topic groupings:

Basic care, self-management and education

1. People with diabetes should receive high quality structured self-management education that is tailored to their individual and cultural needs. They and their families/whānau should be informed of, and provided with, support services and resources that are appropriate and locally available.
2. People with diabetes should receive personalised advice on nutrition and physical activity, together with smoking cessation advice and support if required.
3. People with diabetes should be offered, as a minimum, an annual assessment for the risk and presence of diabetes-related complications and for cardiovascular risk. They should participate in making their own care plans, and set agreed and documented goals/targets with their health care team.
4. People with diabetes should be assessed for the presence of psychological problems with expert help provided if required.

Management of glycaemia and cardiovascular risk for people with diabetes

1. People with diabetes should agree with their health care professionals to start, review and stop medication as appropriate to manage their cardiovascular risk, blood glucose and other health issues. They should have access to glucose monitoring devices appropriate to their needs.
2. People with diabetes should be offered blood pressure, blood lipid and anti-platelet therapy to lower cardiovascular risk when required in accordance with current recommendations.
3. When insulin is required it should be initiated by trained health care professionals within a structured programme that, whenever possible, includes education in dose titration for the person with diabetes.
4. People with diabetes who do not achieve their agreed targets should have access to appropriate (and timely) expert help.

Management of diabetes complications

1. All people with diabetes should have access to regular retinal photography or an eye examination, with subsequent specialist treatment if necessary.
2. All people with diabetes should have regular checks of renal function (eGFR) and albuminuria or proteinuria (ACR or PCR) with appropriate management and/or referral if abnormal.
3. People with diabetes should be assessed for the risk of foot ulceration and, if required, receive regular review. Those with active foot problems should be referred to and treated by a multidisciplinary foot care team within recommended timeframes.
4. People with diabetes with serious or progressive complications should have timely access to expert/specialist help.

While in hospital

1. People with diabetes admitted to hospital for any reason should be cared for by appropriately trained staff, and provided access to an expert diabetes team when necessary. They should be given the choice of self-monitoring and encouraged to manage their own insulin whenever clinically appropriate.
2. People with diabetes admitted as a result of uncontrolled diabetes or with diabetic ketoacidosis should receive educational support before discharge and follow-up arranged by their GP and/or a specialist diabetes team.
3. People with diabetes who have experienced severe hypoglycaemia requiring emergency department attendance or admission should be actively followed up and managed to reduce the risk of recurrence and readmission.

Special groups

1. Young people with diabetes should have access to an experienced multidisciplinary team including developmental expertise, youth health, health psychology and dietetics.
2. All patients with type 1 diabetes should have access to an experienced multidisciplinary team, including expertise in insulin pumps and continuous glucose monitoring systems when required.
3. Vulnerable patients, including those in residential facilities and those with mental health or cognitive problems, should have access to all aspects of care, tailored to their individual needs.
4. Those with uncommon causes of diabetes (eg, cystic fibrosis, monogenic, post-pancreatectomy) should have access to specialist expertise with experience in these conditions.
5. Pregnant women with established diabetes and those developing gestational diabetes mellitus (GDM) should have access to prompt expert advice and management, with follow-up after pregnancy. Those with diabetes of child-bearing age should be advised of optimal planning of pregnancy including the benefits of pre-conception glycaemic control. Those not wishing for a pregnancy should be offered appropriate contraceptive advice as required.

Introduction to the toolkit

Diabetes mellitus is a long term complex metabolic disorder characterised by high levels of blood glucose and caused by defects in insulin secretion and/or action. Diabetes increases the risk of damage to the heart, brain, eyes, kidneys, nerves, blood vessels and many other body systems. It is expected that implementation of improved care processes as described in this set of twenty Quality Standards for Diabetes Care in NZ (the Standards) will reduce the complications, morbidity and mortality associated with diabetes. The Standards are arranged into five topic groupings:

- Basic care, self-management and education
- Management of diabetes and cardiovascular risk
- Management of diabetes complications
- While in hospital
- Special groups.

These standards for Diabetes Care need to be considered as part of an overall systems approach to diabetes. They should be considered in their entirety and implemented via an alliancing framework. Service level alliances should include people with diabetes and utilise clinical governance processes to reduce variation, share learning and focus on improving safety, quality and cost effectiveness.

Health care is a complex, adaptive system and, as such, ongoing adjustment will be necessary. Due to the multifaceted nature of diabetes, its management draws on many areas of health care, and care is 'typically complex and time-consuming' (NICE 2009, p 4). According to NHS Diabetes (2010) 'People with diabetes should receive regular structured care, annual or more frequently as appropriate, based on a care planning approach' (p 4).

The Standards describe principles for high-quality, cost-effective care that, when delivered collectively, should improve the effectiveness, safety and experience of care for people with diabetes in the following ways (NICE 2009):

- enhancing both physical and psychological quality of life
- treating and caring for people in a safe environment and protecting them from avoidable harm
- ensuring that people have a positive experience of care
- helping people to recover from episodes of ill health
- preventing people from dying prematurely or experiencing disability.

Rationale for the toolkit

Diabetes presents a serious health challenge for New Zealand, with 8% of the adult population known to have type 2 diabetes, rising at a rate of 7–8% per annum, and 25% known to have pre-diabetes (Coppell et al 2013). According to the Virtual Diabetes Register (VDR) as at 31 December 2013 (summary at New Zealand Society for the Study of Diabetes website), the overall diabetes prevalence rate for New Zealand is 243,125, based on primary health organisation (PHO) registered patients by district health board (DHB) domicile. Thus, expected numbers are likely to be in the vicinity of 260,000–265,000 by the end of 2014, and 275,000–290,000 by the end of 2015.

Type 2 diabetes is increasingly being diagnosed at younger ages, even in childhood, with increased morbidity and mortality in this age group (Constantino et al 2013). In addition, the prevalence of gestational diabetes mellitus (GDM) is also increasing. Type 1 diabetes occurs at any age; however, it is more common in young people and New Zealanders of European descent, but it also occurs among other ethnic groups (Joshy and Simmons 2006). Consistent with worldwide trends, the prevalence of type 1 diabetes is increasing by 4% annually (Willis et al 2006). This is despite there being no clear association with modifiable risk factors (eg, obesity, low physical activity levels and smoking), as is the case for type 2 diabetes.

The Ministry of Health has a number of health targets on which DHBs are required to report. For diabetes, the target is encompassed within a risk assessment for cardiovascular disease that is inclusive of having an HbA1c test. The current target for ‘More Health and Diabetes Checks’ states that 90% of the eligible population should have had their cardiovascular risk assessed in the last five years, to be achieved by July 2014.

The Ministry of Health has now developed this set of Quality Standards for Diabetes Care (the Standards) encompassing wide ranging aspects of diabetes care. The objective of the Standards is to guide DHB planning and funding departments, managers, clinicians and consumers who are involved in the design and delivery of health services, on what and how services could be provided across the continuum of care (prevention, primary health and secondary care specialist services) and the full spectrum of diabetes (lifespan, pregnancy, complications and other vulnerable groups). These standards should be considered when planning your local service delivery. They provide guidance for clinical quality service planning and implementation of equitable and comprehensive patient-centred care – scaled to local diabetes prevalence. They should be read alongside the NZGG and other guidelines that highlight specific clinical expectations. The Standards will also guide the measurement of meaningful outcomes.

The Ministry of Health is supporting the implementation of these standards through the provision of a toolkit that will include the rationale for each Standard, as well as implementation and evaluation advice. There is considerable potential for improving the consistency of services across DHBs and providing a mechanism for measuring and benchmarking through the implementation of the Standards. The process included:

1. the establishment of an advisory group to guide project planning, toolkit development and content
2. a limited literature review to identify key guidelines, academic rationale and evidence for each of the Standards
3. identifying relevant toolkits locally and from other countries and disciplines
4. contacting planning and funding departments and clinical leaders to identify examples of implementation and innovative practice relevant to each Standard

5. reviewing and analysing identified innovations or models of care (national or international) for their quality, effectiveness, accessibility and generalisability across New Zealand
6. reporting to, and gaining feedback from, the Ministry of Health National Diabetes Service
7. Improvement Group members and the Ministry of Health Long Term Conditions Team
8. consultation with a range of stakeholders and experts.

Who is this toolkit for and how will it help you?

This toolkit provides information and resources to support service planning and delivery. Services should be designed to ensure delivery is coordinated across all relevant agencies encompassing the whole diabetes care pathway. An integrated approach to provision of services is fundamental to the delivery of high-quality care to people with diabetes. Where possible and appropriate, linkage with long term condition care programmes will promote and strengthen implementation success. This toolkit will guide planners and funders, managers, clinicians and people with diabetes as they design and implement diabetes care services across the health continuum and local Diabetes Care Improvement Plans. Service design should occur in conjunction with locally agreed clinical pathways, such as the Map of Medicine or the Canterbury HealthPathways.

Toolkit structure

The toolkit has been developed for easy reading and reference. Although many are related, each Standard is addressed separately with a corresponding introduction inclusive of academic rationale and evidence, implementation advice, implementation examples and innovations, assessment tools and resources. Where possible, links are provided to take you directly to the corresponding website or resource. Therefore, for each Standard there are seven key sections:



Introduction

A general description/expansion of the standard incorporating the evidence/academic rationale underlying the Standard.



Guidelines

Specific guidelines of care pertaining to each Standard. New Zealand Guidelines are presented with priority. International guidelines and/or expert/consensus/position statements are provided where New Zealand guidelines do not exist and/or to provide additional information.



Implementation advice

Suggestions for how the guidelines associated with the Standard can be put into practice or realised.



Implementation examples/innovations

Descriptions of models of service delivery/care which exemplify the Standard in practice. These may describe a practice model or include the results of an evaluation with outcomes.



Assessment tools

A range of potential quality indicators and/or service evaluation/outcome measures for each Standard to measure effectiveness of implementation.



Resources

A repository for links to resources that might be useful in implementing the standards or recommendations linked to a Standard. It may include (a) handouts for patients (b) links to website resources for patients/professionals and (c) patient specific assessment tools such as patient questionnaires.



References

References for each Standard.

Underpinning frameworks

New Zealand Triple Aim

The Triple Aim is a health care improvement policy that was initially developed in the United States. It outlines a plan for better health care systems by pursuing three aims: improving patients’ experience of care, improving the overall health of a population and reducing the per-capita cost of health care. In New Zealand, the policy has been adapted by the Health Quality and Safety Commission (HQSC) and is one of the key tenets of the Integrated Performance Incentive Framework.

The HQSC of New Zealand strives to achieve the Government’s outcomes through the Triple Aim. The Triple Aim for quality improvement includes:

- improved quality, safety, and experience of care
- improved health and equity for all populations
- best value for public health system resources.



To evaluate the Triple Aim, assessment tools and clinical indicators are applied in a variety of ways with a focus on structure, process or outcome:

- Structure – refers to the health system’s characteristics that affect the system’s ability to meet the health care needs of individual patients or a community (eg, access to specific technologies and having clinical guidelines in place and revised regularly).
- Process – refers to what the provider did for the patient and how well it was done (eg, the proportion of people with diabetes given regular foot care and the proportion of people with an individualised plan of care).
- Outcome – refers to states of health or events that follow care and that may be affected by health care (eg, intermediate or end result outcomes) (Mainz 2003).

The Health Quality and Safety Commission NZ Annual Report 2012–2013 includes the development of the **NZ Atlas of Health Care Variation**, and a diabetes atlas was launched in July 2014. This online tool is designed for clinicians, users and providers of health services to identify variations in the health care delivered in different geographical regions. It is designed to prompt debate and raise questions about why differences in health services' use and provision exist, and to stimulate change and improvement in practice through this debate. The Standards and associated outcome measures will provide key features to be included as the Atlas develops further.

www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/

Integrated Performance and Incentive Framework

The Integrated Performance and Incentive Framework (IPIF) is intended to support the health system in addressing equity, inequality, safety, quality, access and sustainability of services. It sets high level directions for improved effectiveness and productivity of health care for the whole population, while monitoring progress towards better services and creating an environment that supports constructive, collaborative, and professionally driven quality improvement in front-line services. The initial scope focuses on primary care providers with the intention to rapidly extend the scope to cover a wider range of integrated health services. Where possible, assessment tools for each of the Standards will link to the IPIF; however, many will sit outside this framework at the present time (Ministry of Health 2014a).

Implementation advice

Implementation advice is provided specific to each Standard. A first step is to know your community's need for diabetes services. The Virtual Diabetes Register (VDR) provides a summary of prevalence data for each DHB by ethnicity and can be found here: www.nzssd.org.nz/news/Virtual%20Diabetes%20Register%20release%2031%20Dec%202012.pdf

In the VDR, type of diabetes is not identified; however, this is important as type 1 and type 2 diabetes are distinctly different conditions, requiring different services and approaches. Recognising the elements of diversity in your community – type of diabetes, ethnicity, age, social deprivation, geographical isolation, etc – is thus essential for the design and delivery of services that meet the needs of your community and to ensure appropriate reach.

Overarching implementation principles to be applied:

- the Standards should be considered in their entirety and implemented via an alliancing framework
- service level alliances can include people with diabetes and utilise clinical governance processes to reduce variation, share learning and focus on improving safety, quality and cost effectiveness
- planning processes should be clinically led and agreed with a range of professional and community perspectives at the table (IPIF EAG report 2014a)
- service design should occur in the light of locally agreed clinical pathways such as the Map of Medicine, Canterbury HealthPathways or Northern Regional clinical pathways

- prior to implementation, it is important to consider current organisational infrastructure that addresses the following:
 - system and process design
 - training and education
 - culture and the need to shift values, beliefs and behaviours of the organisation.

Equality and diversity considerations applicable to all Standards

All information about treatment and care should take into account age and social factors, language, accessibility, physical, sensory or learning difficulties, and should be ethnically and culturally appropriate. It should also be accessible to people who do not speak or read English. If needed, people with diabetes should have access to an interpreter or advocate. Local resources should be available to support people with specific needs.

Specific relevance to Māori and Pacific people

The impact on Māori people

Māori have on average the poorest health statistics of any ethnic group in New Zealand, and the government has made it a key priority to reduce these inequalities (Ministry of Health 2014c). Harwood and Tipene-Leach (2007) suggest: 'For no other disease are significant health inequalities more obvious than when we look at diabetes' (p 162). Diabetes is almost three times more common in Māori than non-Māori. In addition, for Māori aged 45–64 years, death rates due to diabetes are nine times higher than for non-Māori New Zealanders of the same age. Māori are diagnosed younger and are more likely to develop diabetic complications, such as eye disease, kidney failure, strokes and heart disease.

Prevalence estimates for diabetes in New Zealand are complicated by the issue of undiagnosed diabetes mellitus in the community. Some commentators estimate that for every one person known to have diabetes, there is one undiagnosed. Incidence and mortality rates for type 2 diabetes are expected to significantly increase over the next 20 years (along with pre-diabetes, insulin resistance, and obesity), with the biggest impact being on Māori, Pacific people, and those living in deprived neighbourhoods. Additionally, there is a growing number of children and adolescents developing type 2 diabetes, and it is known there is increased morbidity and mortality in this age group (Constantino 2013).

New Zealand's health context is unique in that our health inequalities between Māori and non-Māori can be held to redress in part by New Zealand's founding document, the Treaty of Waitangi. As controversial as the Treaty is, part of its obligation is to provide equality. That means, within the health context, Māori should be able to enjoy the same health and wellbeing as non-Māori and Māori health interests are protected. Additionally, Māori should have equal access to appropriate health services (Kingi 2007). This also adheres to the HQSC of New Zealand's Triple Aim Strategy.

In a study reported by the Ministry of Health (2013b), access to health care was found to be reduced for Māori. Cost prevented 23% of Māori adults and 8% of Māori children from visiting a GP when they needed to in the previous 12 months, whilst many Māori adults (18%) and children (12%) did not collect a prescription item in the previous 12 months due to the costs). Also of note, health literacy may be an issue, as shown in the recent Māori health literacy research into gestational diabetes (Ministry of Health 2014b). Poor health literacy is a barrier to understanding and managing gestational diabetes which is a precursor to type 2 diabetes.

Examples of government strategies intended to address health inequalities are the implementation of the He Korowai Oranga: Māori Health Strategy (Ministry of Health 2014c); the Māori Provider Development Scheme; Māori Hauora/health scholarships; promotion of Māori health models; DHB Māori Health Plans; Whānau Ora programmes and funding rongoā Māori in some areas.

The Ministry of Health website describes models of health for Māori, and these are helpful for understanding Māori Health perspectives. It can be accessed at: www.health.govt.nz/our-work/populations/Māori-health/Māori-health-models

Some helpful recommendations for providing care to Māori with diabetes can be found in the booklet prepared for the Medical Council of New Zealand by Mauri Ora Associates – Best health outcomes for Māori: Practice implications. It can be accessed at: www.mcnz.org.nz/assets/News-and-Publications/Statements/Best-health-outcomes-for-Maori.pdf

The impact on Pacific peoples

According to Foliaki and Pearce (2003), diabetes prevalence has increased rapidly over time in the indigenous people of the Pacific region (Polynesian, Melanesian, Micronesian), both in the Pacific Islands and in countries such as New Zealand. Pacific peoples experience greater morbidity and more complications than New Zealand Europeans with diabetes. This was confirmed by Statistics NZ based on 2002–2004 data, where it is stated the incidence of cardiovascular disease, diabetes, and respiratory illness is significantly higher among Pacific peoples than other ethnic groups. In addition, type 2 diabetes occurs earlier in Pacific peoples, about 10 years before New Zealand Europeans, including a growing number of children and adolescents, and young people with type 2 diabetes are at greater risk of morbidity and mortality (Constantino 2013).

In the 2013 report on the Adult Nutrition Survey, Coppel et al found that diabetes was prevalent among Māori and Pacific peoples, and particularly high among Pacific peoples. One-third or more of Pacific people aged 45 years and over had diabetes. Age-specific rates of undiagnosed diabetes were highest among Pacific peoples, for whom the ratio of diagnosed to undiagnosed diabetes was 5:4 compared with 10:3 for Māori and 10:1 for New Zealand Europeans. The highest prevalence of diabetes was observed among Pacific peoples, with rates among Māori in-between that observed for Pacific and the NZ European/Other (NZEO) groups. Rates increased with age, with the highest prevalence observed for those aged 75 years and over. Some helpful recommendations for working with Pacific peoples with diabetes can be found in the booklet prepared for the Medical Council of New Zealand by Mauri Ora Associates – Best health outcomes for Pacific peoples: Practice implications. It can be accessed at: www.mcnz.org.nz/assets/News-and-Publications/Statements/Best-health-outcomes-for-Pacific-Peoples.pdf

Workforce implications

Implementation of the Standards may require investment or re-organisation of current diabetes services. Health Workforce New Zealand's Diabetes Workforce Service Review (2011) identified the need for appropriate workforce planning in order to meet anticipated demand in the year 2020. The report identified the need for active succession planning for all disciplines involved in diabetes services as expertise required to deliver high quality care develops over time and with ongoing exposure to challenging clinical scenarios. Many of these experienced diabetes professionals are in the latter part of their career. There are limited or no training positions or resource mentors for the future diabetes workforce across the core disciplines of medicine, nursing, dietetics and podiatry. In general, workforce planning should be matched to population health needs.

Specifically, the review concluded the following: 'People with diabetes have differing health care needs relating to their diabetes subsequently the diabetes workforce comprises a large multidisciplinary team spanning the health continuum and service providers with varying levels of expertise. As diabetes occurs across the lifespan and concomitantly with many other conditions, multiple services are required at different times or at the same time. Workforce surveys reveal inadequate provision of core disciplines in diabetes care (medical, nursing, dietetic and podiatry), little or no succession planning and inadequate training positions. Structured patient education is delivered inconsistently and is not always evidence-informed; a national curriculum in patient education is needed' (p 2).

Specific recommendations pertaining to diabetes service delivery included the following:

- implementation of the recommendations in the Cardiovascular and Diabetes Quality Improvement Plan should continue
- funding models should support interdisciplinary care and innovative practice
- communication between patients' diabetes providers should be enhanced to ensure effective coordination of care
- health professionals should practise to the top of their scope of practice as per the Health Practitioners' Competency Assurance Act.

Targeted investment in workforce training and development was recommended as follows:

- role delineation should be clear so that diabetes education and training can be appropriately targeted
- all diabetes health care providers, both professionals and non-regulated health workers, should receive appropriate ongoing education and training from an accredited education provider
- agreed national curriculum and standards should be developed for the delivery of education and training
- the National Diabetes Nursing Knowledge and Skills Framework (NDNKSF) should be utilised as a foundational document to guide curriculum development for all other disciplines
- ongoing education updates should be a requirement for the delivery of diabetes services
- informational competency, to ensure that health professionals can effectively utilise IT systems, should be developed and/or enhanced
- diabetes health care professionals should be trained and supported to enable them to deliver emotional and psychological support themselves, at an appropriate level, with the aim of embedding this as an integral part of health care professional training for the future

- cultural competency should be demonstrated by outcomes' measures
- mentor programmes such as Te Ohu Rata o Aotearoa aimed at increasing the number of Māori specialists should be supported.

Diabetes UK published the Commissioning Specialist Diabetes Services for Adults with Diabetes Report in 2010. The report states: 'Highly skilled and committed primary care teams now deliver a greater amount of routine diabetes care, including much of the day-to-day support for many people with diabetes. The role of the multidisciplinary specialist diabetes team remains the hub and spoke of high-quality care for all. Diabetes care may be delivered by a variety of providers in a range of different settings, resulting in the model of care varying from one locality to another. How specialist diabetes care is organised will vary depending on local needs, skills, resources and organisation. All integrated diabetes services must see to it that specialist diabetes expertise and support are built into the model of care' (p 5).

Whilst the Diabetes UK report recommends minimum staffing levels (Diabetes UK 2010), to date there are no such New Zealand recommendations for minimum workforce requirements; however, various modelling exercises are under way. Current New Zealand expert opinion from clinical leaders suggests minimum staffing requirements for specialist practitioners providing secondary care level services, as per the Ministry of Health Service Specifications for diabetes care (2011), in all disciplines working within the co-located (Scottish Intercollegiate Guidelines Network 2010) multidisciplinary team (MDT):

- **Senior medical officers (SMO) (endocrinologist or diabetologist):** approximately 1.5 full-time equivalent (FTE) per 10,000 people with diabetes. Additionally all DHBs (unless fewer than 2000 people with diabetes) should have a lead SMO for diabetes with a minimum of 4–5 sessions per week. DHBs with over 10,000 people with diabetes should have a lead SMO whose priority (≥ 0.5 FTE) job is diabetes. Larger centres should also have registrars in training for diabetes and endocrinology.
- **Diabetes nurse specialists:** approximately 5.0 FTE per 10,000. Ideally, all or most of these nurses will be accredited diabetes nurse specialists (DNS) according to the Aotearoa College of Diabetes Nurses New Zealand Nurses Organisation's process, and some would be authorised as designated registered nurse prescribers. In addition, nurse practitioners would add value to diabetes services through advanced clinical practice, clinical leadership and mentoring/training of more junior nursing and medical staff. Specialist MDT services are well-placed to provide opportunities for nurses and other members of the MDT developing additional skills in diabetes care through formal training programmes (such as the Waikato Diabetes Service programme), and with adequate resources, training/mentoring of primary care nursing teams by accredited DNS.
- **Diabetes specialist dietitians:** approximately 4.0 FTE per 10,000. Their caseload would encompass working with type 1 diabetes, children, adults, young people and individuals with mental health problems. The role provides advice and teaching in a range of specialist areas, including carbohydrate counting, insulin pump use and structured diabetes patient education. This is in addition to community dietitians responsible for routine work, inclusive of type 2 diabetes and insulin initiation and management.
- **Podiatrists:** approximately 1.5 FTE per 10,000. Foot care is an essential aspect of all specialist diabetes services, providing the skills, technology and information to prevent and manage complex diabetic foot disease. Ideally, an integrated foot care service should be provided as part of the responsibility of a specialist multidisciplinary team providing primary and secondary prevention, management and treatments meeting national guidelines and standards. Additionally, there should be community podiatry services for care of the low risk foot.

- **Psychologists:** 0.2–0.4 FTE per 10,000. Meeting the emotional and psychological needs of people with diabetes is an integral part of diabetes care. A range of psychological skills will be required to deliver specialist psychological support to those people with diabetes with complex psychological needs associated with their diabetes. Key aspects of a psychological service include patient care, training and supervision of the wider diabetes team, research, audit and service development.

All this should be **additional** to any specialty expertise provided by primary health organisations, general practice teams or iwi/Māori providers as the population groups being served have differing levels of complexity requiring different skill sets. Services providing diabetes care across the spectrum of providers should also be linked to, and work as, part of the base specialist secondary care service MDT. Specialist secondary care service and primary care workforce requirements will vary by DHB, population characteristics, ethnicity, deprivation, geography and model of care. Development of the primary care workforce is important as more routine and moderate-complexity diabetes care is provided by general practice teams or PHO based teams.

According to the Health Workforce New Zealand (HWNZ) Diabetes Service Workforce Review (2011), primary health care teams should receive appropriate training and support, and should be sufficiently experienced to deliver high quality care to the increasing diabetes population. Primary health care teams should be configured to provide structured team-based long term condition care which will include:

- coordination of all components of care
- a comprehensive ‘free’ annual diabetes review for all patients with diabetes
- adequately funded time to provide full assessment, education and ongoing monitoring of people with type 2 diabetes
- Whānau Ora models of care applied in practice.

The Ministry of Health Service Specifications for Diabetes Services require nurses to be trained in accordance with the National Diabetes Nursing Knowledge and Skills Framework (NDNKSF) (Snell et al 2009). Other disciplines could also benefit from the same requirements (HWNZ 2011).

Various opportunities based on the NDNKSF exist for professional development, such as tertiary based programmes, online learning via the **Health Mentor Online** resources (available at: www.healthmentoronline.com/), and locally delivered programmes. Specialist diabetes services have a role in supporting the development of the primary care workforce across all disciplines; however, appropriate resourcing is required to enable this to occur.

Developing the Māori workforce across the spectrum of service providers and disciplines is essential in order for services to provide appropriate care to Māori individuals, their whānau and all New Zealanders (Ministry of Health 2013c). In 2012, there were 77,929 Māori students studying in tertiary institutions in New Zealand. Of these 12,116 (15.5%) students were enrolled in health-related subjects with 2285 (18.9%) students completing their health-related qualification in that year. Durie (2003) supports increasing the indigenous workforce and discusses pertinent points when looking at workforce issues for Māori. For example, if the doctor and patient are from different cultural backgrounds there is a greater likelihood of non-compliance and misdiagnosis. Furthermore, Durie (2003) recommends giving priority to developing an indigenous health workforce that has both professional and cultural competence, including adopting indigenous health perspectives, such as spirituality, into conventional health services. Emphasis should also be given to self-determination and autonomy. These recommendations from 2003 remain relevant for today.

Similarly, developing the Pacific workforce is also a priority. The Taea o Tautai: Pacific Public Health Workforce Development Implementation Plan 2012–2017 supports the implementation of the national public health workforce strategy Te Uru Kahikatea 2007–2016. Based on a range of research and sector consultations, Taea o Tautai outlines priorities and actions to:

- strengthen the Pacific public health workforce
- increase the capability of the non-Pacific workforce to improve Pacific health gain and reduce inequities.

www.health.govt.nz/publication/taea-o-tautai-pacific-public-health-workforce-development-implementation-plan-2012-2017

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Basic care, self-management and education



Standard 1

People with diabetes should receive high quality structured self-management education that is tailored to their individual and cultural needs. They and their families/whānau should be informed of, and provided with, support services and resources that are appropriate and locally available.

Key practice points

- Structured diabetes education is a critical component of diabetes care.
- There is no strong evidence for any particular approach to structured diabetes education over another. Therefore, it is important to consider the outcomes that are desirable for the population being treated and to consider whether the trial data support the delivery of those outcomes for that population. Content and delivery is then tailored to local need.
- Adequate resources should be funded and in place to provide structured diabetes education.
- Integral to any self-management programme, particularly group programmes, is that they are culturally appropriate. People with diabetes should have access to self-management support which is relevant to the ethnicity they identify with.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that staff are enabled to offer structured education, either on an individual basis or via a programme, that fulfils nationally agreed criteria and is ongoing and accessible to all people with diabetes and/or their carers/family/whānau.

Health care professionals ensure they offer structured education to people with diabetes and/or their carers/family/whānau as part of their ongoing care.

Planners and funders ensure they commission and fund care that is inclusive of structured education/programmes that fulfil nationally agreed criteria and are ongoing and accessible to people with diabetes and/or their carers/family/whānau.

People with diabetes and/or their carers/family/whānau receive structured diabetes education to suit their needs, delivered by trained staff. A health care professional should check every year whether the person would find further diabetes education useful, and diabetes education should continue to be available.

Definitions

Self-management education (SME) is defined as a systematic intervention that involves the person with diabetes' active participation in their self-monitoring (physiological processes) and/or decision-making (managing). It recognises that patient-provider collaboration and the enablement of problem-solving skills are crucial to the individual's ability for sustained self-care.

Self-management education refers to **any** educational processes that provide persons with the knowledge, skills and motivation required to inform decisions and increase the individual's capacity and confidence to apply these skills in daily life situations.

The content and skill-training components of SME must be individualised according to the type of diabetes and recommended therapy, the patient's ability, barriers, motivation for learning and change, culture, literacy level and available resources.

Self-management support refers to policies and people that may support the continuation of self-management behaviours across the lifespan but that are not specific to educational processes (Canadian Diabetes Association Clinical Practice Guidelines Expert Committee 2013).



Introduction

Diabetes presents a serious health challenge for New Zealand because it is a significant cause of ill health and premature death. It is well-recognised that self-care in diabetes can be demanding and is influenced by numerous factors (Snell 2011). Diabetes is considered to be a relatively unique long term condition due to treatment regimens being carried out largely through self-care. Indeed, Anderson et al (1995) estimate that 95% of required care is provided by the person with diabetes and/or their family. This is supported by the findings of a large public health survey on people with a long term condition that states that of the potential 8760 hours in one year, on average only three hours is spent with a health professional, leaving the person with 8756 hours to care for themselves (United Kingdom National Health Service 2007). According to Norris et al (2002), a minimum knowledge base is required for optimal self-care. In addition, several psychosocial mediators are related to diabetes self-care behaviour, such as locus of control, coping styles, health beliefs and self-efficacy.

Self-management education (SME)

The **International Diabetes Foundation (IDF) International Standards for Diabetes Education** are based on the available evidence about diabetes self-management education (DSME), diabetes self-management support (DSMS) and behaviour change. A summary of the evidence is as follows:

- DSME is effective for improving clinical outcomes and quality of life – at least in the short term.
- Diabetes education has evolved from primarily didactic presentations to more theoretically-based empowerment models.
- There is no single best educational programme or approach. However, programmes incorporating behavioural and psychological strategies have demonstrated improved outcomes. Additional studies show that age and culturally appropriate programmes improve outcomes and that group education is at least as effective as individual education.

- Ongoing support is critical in order to sustain the participant's progress resulting from DSME. People with diabetes experience a significant amount of psychological distress at the time of diagnosis and throughout their life, and these psychosocial issues affect their self-management efforts.
- Strategies such as self-directed goal-setting and problem solving are effective for supporting behaviour change.

The full document can be found here: www.idf.org/education/resources/standards

The State of Michigan's Health Care Providers' Guide to Diabetes Self-Management Education (DSME) Programs in Michigan provides the following academic rationale:

- Norris et al (2001) reviewed 72 randomised controlled trials of diabetes self-management training (DSMT) in type 2 diabetes and concluded that there were positive effects of self-management training on knowledge, frequency and accuracy of self-monitoring of blood glucose, self-reported dietary habits and glycaemic control in studies with follow-up timeframes of six months or less.
- Another meta-analysis by Norris et al (2002) concluded that DSMT is effective in decreasing HbA1c in the short term and states '... effective diabetes education is an integral part of comprehensive diabetes care'(p 1168)
- The 10-year United Kingdom Prospective Diabetes Study (UKPDS) confirmed that intensive blood glucose control in patients with type 2 diabetes reduced the incidence of diabetic complications, especially microvascular disease.
- According to the UKPDS, for every percentage point decrease in glycosylated haemoglobin, (eg, 9% to 8%), there was a 35% reduction in the risk of microvascular complications.
- A study published in the Journal of the American Medical Association indicated that a sustained reduction in HbA1c among adult persons with diabetes was associated with a cost reduction of \$685 to \$950 less per person per year within one to two years of improvement.
- The Diabetes Prevention Program (DPP) found that lifestyle change that effects modest weight loss and increased physical activity can return the blood glucose levels of persons with 'prediabetes' (persons at risk for developing diabetes) to normal range.
- Data analysis in 2007 from the Michigan Behavioral Health Risk Factor Surveillance Survey (MiBRFSS) showed people who had taken a diabetes self-management course were twice as likely to have obtained the recommended annual dilated eye exam, foot exam and two HbA1c tests compared to people with diabetes who had not taken a self-management course.

The full document can be found here:

www.michigan.gov/documents/mdch/ProviderHandbookFINAL9-08_256129_7.pdf

Health literacy

Health literacy is an important element of structured education. A toolkit review written for the National Diabetes Service Improvement Committee describes health literacy as 'the ability to obtain, process, and understand basic health information and services to make appropriate health decisions' (Kickbusch et al 2005 cited in Ministry of Health 2010, p iii). Health literacy includes how an individual navigates and interacts with our complex health system. It also includes people's expectations about health and wellbeing, and their understanding of health messages, medicine labels and nutrition information, as well as their ability to fill out medical forms and talk with their doctor. Specifically related to diabetes, Boren (2009) states, 'health literacy is vital to enable people to manage their health. There are many activities that people are responsible for when self-managing their diabetes that can be particularly challenging when limited health literacy is an issue. These activities include taking medication, eating a healthy

diet, glucose monitoring, and reduction of risks. Persons with diabetes who have multiple complications or experience repeated hospitalizations might have some of these problems because of unrecognised low health literacy’ (p 203). The Boren (2009) article can be found here: www.jdst.org/January2009/articles/VOL-3-1-DIT1-BOREN.pdf.



Guidelines

The **Scottish Intercollegiate Guidelines Network (SIGN)** Clinical Guidelines for the Management of Diabetes (2010) state ‘structured diabetes education based on adult learning (including empowerment and experiential learning) is associated with psychological wellbeing, reduced anxiety and overall improvement in quality of life for people with type 1 and type 2 diabetes. The effect of structured education on glycaemic control in people with type 1 diabetes varies across different programmes’ (p 10). Furthermore, they state ‘Structured education based on developing problem-solving skills targeted at children and adolescents has a positive effect on a number of behavioural outcomes (including frequency of self-monitoring of blood glucose, better compliance with sick day rules, increased levels of exercise, dietary intake and improved medication adherence) and overall quality of life. There is limited evidence for a small reduction in HbA1c (approximately 3 mmol/mol)’ (p 11). www.sign.ac.uk/pdf/sign116.pdf.

The **Canadian Diabetes Association Clinical Practice Guidelines Expert Committee** (2013) state that ‘no particular delivery strategy ... appears to result in consistently superior outcomes in persons with type 2 diabetes; however, larger effect sizes have been noted with strategies that involve personal contact with health care providers, either face-to-face interactions or by telephone. A combination of didactic and interactive teaching methods, as well as group and individual sessions, appears to be most effective for persons with type 1 diabetes’ (p S29).

http://guidelines.diabetes.ca/App_Themes/CDACPG/resources/cpg_2013_full_en.pdf.

For type 1 diabetes, the **American Diabetes Association** recommend that people with type 1 diabetes and parents/caregivers should receive culturally sensitive and developmentally appropriate individualised DSME and DSMS according to national standards at diagnosis and routinely thereafter. The specific content is detailed in the table below:

Infancy (birth–18 months)
Period of trust versus mistrust
Providing warmth and comfort measures after invasive procedures is important
Feeding and sleeping or nap routines
Vigilance for hypoglycaemia
Play age (3–5 years)
Reassurance that body is intact, use of band-aids and kisses after procedures
Identification of hypoglycaemic signs and symptoms (temper tantrums and nightmares are common)
Include child in choosing injection and finger-prick sites
Positive reinforcement for cooperation
Begin process for teaching child awareness of hypoglycaemia
School age (6–12 years)
Integrate child into educational experience
Determine skill level
Identify self-care skills
Determine roles and responsibilities
Communication with peers and school staff who and when to tell about diabetes

Adolescence (12–18 years)

Begin transition care planning
Personal meaning of diabetes
Determine roles and responsibilities in care
Social situations and dating
Who or when to tell about diabetes
Driving
Sex and pre-conception counselling
Alcohol and drugs
College and career planning

Young adults

Personal meaning of diabetes
Roles and responsibilities in care
Social situations and dating
Who or when to tell about diabetes
Genetic risks, conception, and pre-conception
Travel
Choosing or pursuing a career
Workplace rights
Health or life insurance
Involving friends and significant others in diabetes care
Safety
Creating a support network
Establishing or maintaining independence

Middle-aged adults

Personal meaning of diabetes
Roles and responsibilities in care
Involving spouse or significant other in care
Sexual functioning
Developing a support network
Travel
Pursuing a career
Workplace rights
Health or life insurance
Talking with children or other family members about diabetes
Balancing other responsibilities with diabetes care
Safety
Facing complications

Older adults

Personal meaning of diabetes
Roles and responsibilities in care
Maintaining independence
Obtaining assistance with diabetes care tasks
Involving spouse or significant other in care
Travel
Talking with adult children or other family members about diabetes
Safety
Assessing for declines in ability to perform self-care/activities of daily living
Caring for diabetes along with other chronic illnesses or comorbidities
Obtaining health care when living in multiple locations
Community resources
Care of type 1 diabetes in long term or other care facilities



Implementation advice

Self-management education

As structured diabetes education is a critical component of diabetes care, it should be offered at diagnosis and on an ongoing basis (see Standard 16). When considering a structured education programme, the **Scottish Intercollegiate Guidelines Network (SIGN) Clinical Guidelines for the Management of Diabetes (2010)** state ‘the lack of head-to-head comparative trials renders it impossible to recommend one specific programme over another. Therefore, it is important to consider the outcomes that are desirable for the population being treated and to consider whether the trial data support the delivery of those outcomes for that population’ (p 10). Content and delivery is then tailored to local need. Overall recommendations include:

Content

- Programmes should be evidence-informed, and suit the needs of the individual.
- The programme should have specific aims and learning objectives.
- Content must be specific to the diagnosis (eg, pre-diabetes versus type 2 diabetes).
- It should support the learner plus his or her family/whānau/carers in developing attitudes, beliefs, knowledge and skills to self-manage diabetes.
- Standards in teaching and use of adult learning techniques are basic to providing interactive sessions that take into account the learning needs and abilities of the group.
- There must be flexibility of timing and venue to accommodate participants’ preferences.
- Utilisation of a variety of delivery modes should be implemented (eg, face-to-face or contemporary, quality assured and New Zealand-centric online consumer resources).
- The programme should have a structured curriculum that is theory-driven, evidence-based and resource-effective, has supporting materials, and is written down.

Delivery

- No particular delivery strategy results in superior outcomes in people with type 2 diabetes. A combination of didactic and interactive teaching methods, as well as group and individual sessions, appears to be most effective.
- The programme should be delivered by trained individuals who have an understanding of educational theory appropriate to the age and needs of the learners, and who are trained and competent to deliver the principles and content of the programme.
- A team approach including paid lay coaches or mentors, where possible, could be complementary.
- Community champions can be pivotal to the success of diabetes self-management education and support in ethnic communities, and therefore should be encouraged and funded to participate where possible.

Funding

- Appropriate funding must be allocated to provide for coordination, implementation and evaluation over the long term. Funding must also provide for initial and ongoing education for facilitators at all levels, as well as opportunities for feedback on performance and collegial support.

Evaluation

- Pre- and post-evaluation of participants' knowledge, skills and the usefulness of content should be standard.
- The programme should be quality assured, and be reviewed against criteria that ensure consistency and cultural safety.
- The outcomes from the programme should be regularly audited and reported (as per Outcome monitoring below).
- Patients and their medical homes (medical home: a model of the organisation of primary care that delivers the core functions of primary health care) should have confidential feedback on topics discussed and individual pre- and post-evaluation results.
- Follow-up by health care providers is required to optimise and support patient learning, the reaching of self-set goals and maintaining behaviour change over time.

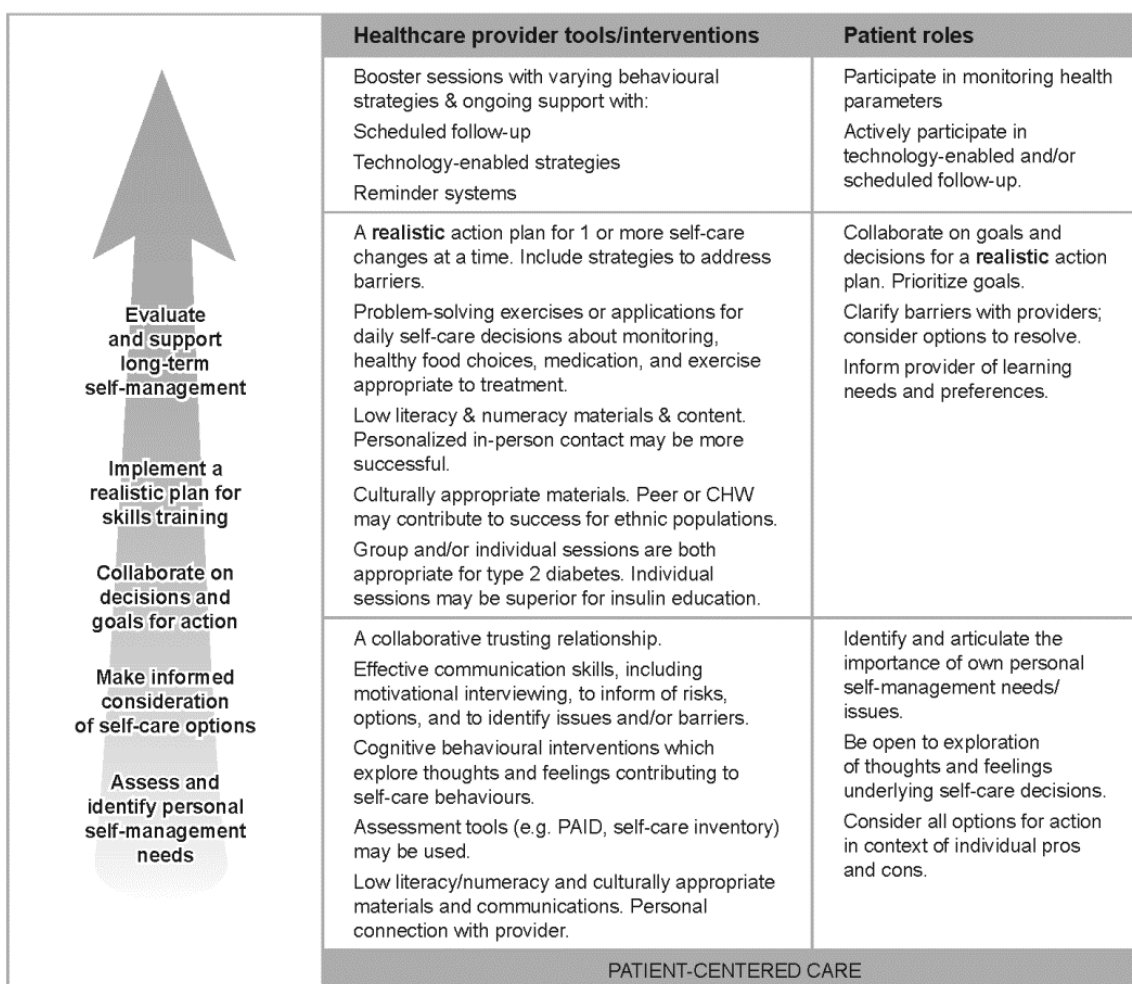
Canadian Diabetes Association Clinical Practice Guidelines Expert Committee (2013) state the following:

'Interventions that include face-to-face delivery, a cognitive-behavioural method and the practical application of content are more likely to improve glycaemic control. The most effective behavioural interventions involve a patient-centred approach, shared decision-making, the enablement of problem-solving skills and the use of action plans directed toward patient-chosen goals. Steps to success in self-management education (SME) are summarised in Figure 1' (p S28).

It can be accessed at:

http://guidelines.diabetes.ca/App_Themes/CDACPG/resources/cpg_2013_full_en.pdf.

Figure 1: Steps to success in self-management education



Cultural relevance for Māori

Integral to any self-management programme, particularly group programmes, is that they are culturally appropriate. People with diabetes should have access to self-management support which is relevant to the ethnicity they identify with; for example, a programme underpinned by kaupapa Māori approaches. These approaches enrich the environment for effective learning by focusing on:

- tinorangitiratanga – self-determination
- taonga tuku iho – cultural aspirations
- ako Māori – culturally preferred ways of learning
- whānau – the extended family members and their influence and support
- kaupapa – the collective philosophy of the members of the group.

Health literacy and technology

Boren (2009) undertook a review of the potential effectiveness of technology-based interventions to support health literacy. She concluded that there were a few information and communication technology opportunities that might be appropriate for intervention. These are listed here:

- communication techniques and interactive communication strategies for patients and providers
- viewpoints and experiences of the patient population to determine the optimal context, channels, and content
- computer-based algorithms that take a patient's characteristics into account, such as language, age, gender, ethnicity, reading ability, health literacy level, and specific goals or needs.
- electronic medical record to prompt the use of plain language, limit the number of concepts covered and assess patient understanding by using tell back or teach back
- interactive multimedia programs for education and counselling
- health information prescriptions that include a link or recommendation to an appropriate website and/or referral to a health librarian
- telephone or cellphone interventions for education, counselling, and reminding.



Implementation examples / innovations



Group-based diabetes self-management education

A structured, group-based diabetes self-management education (DSME) programme for people, families and whānau with type 2 diabetes (T2DM) in New Zealand: An observational study (Krebs et al 2013).

Synopsis: a six-week DSME programme tailored for the unique social and ethnic environment of New Zealand was developed using concepts from internationally developed programmes and effectiveness was assessed in an observational study with people with type 2 diabetes (aged 18–80 years) from diverse cultural backgrounds. Clinical data were collected from primary care at baseline, three, six and nine months. Krebs et al concluded that a group-based DSME programme designed specifically for the New Zealand population was effective at improving aspects of diabetes care at six months. The attenuation of these improvements after six months suggests a refresher course at that time may be beneficial.



The Manawatu, Horowhenua, Tararua Diabetes Trust offers consumer education courses for people diagnosed with diabetes and their family members. Education sessions are provided in group sessions across the MidCentral Health District and in general practices on request about:

- diabetes 'Healthy Living', including a free supermarket tour
- carbohydrate awareness courses
- diabetes 'healthy food choices and label reading'
- type 1 support persons course
- pre-diabetes education.

For more information go to: www.diabetestrust.org.nz/.



In **Waitemata District Health Board (DHB) the Dose Adjustment for Normal Eating (DAFNE)** programme for people with type 1 diabetes was implemented and assessed for clinical and cost effectiveness.

Synopsis: DAFNE is recommended by NICE in the UK as best clinical management for patients with type 1 diabetes. The DAFNE team currently comprises six DAFNE educators, a part-time administrator and two physicians. DAFNE graduates are invited to a rolling program of follow-up, which is currently being piloted. Clinical contact is recorded on the patient information management system (PIMS) and the concerto, cardiovascular and diabetes information system (CVDIS). The authors report that they have delivered 18 courses (152 patients) with 100% attendance. Principal DAFNE goals to improve quality of life and reduce severe hypoglycaemia have been achieved (PAID [diabetes distress] score reduced 50%, hypos reduced by 70%). Lipids, creatinine and HbA1c all improved. Mean improvement in HbA1c at one year was 0.1% but this included patients who have improved from overly tight control. Course costs per patient include a salary for educator time allocated to a pre-course assessment, a five-day course, a follow-up rolling programme, preparation and stats collection and email support, a one-year follow-up clinic and 30% overhead. This calculates to \$466 per patient. Compared to a clinic setting, if a patient sees a nurse twice per year, a dietitian and consultant once a year, this calculates to \$236 per patient. The authors concluded that initial outlay costs for the course are feasible. When the amount of time the patient has alongside a clinician, 50 hours for the DAFNE programme (including FU,) is compared with 3.67 hours of standard care, the cost benefit is \$9/hour of clinician time for DAFNE and \$64/hour for standard care. They go on to say that increased patient autonomy, which is another key goal of the DAFNE programme, will reduce patient dependency on one-to-one clinic visits.

www.hiirc.org.nz/page/20562/how-to-incorporate-dafne-into-routine-clinical/?q=McNamara%20&highlight=mcnamara§ion=10538



Central Primary Health Organisation (PHO), MidCentral DHB and Arthritis NZ work together to offer a free Stanford 'Living a Healthy Life' Course for patients and/or their carers/families/whānau to improve their self-management skills to manage their long term conditions in daily life.

The key principles of self-management covered in the course content are:

- know and understand your condition
- monitor and manage signs and symptoms
- actively share in decision-making with health professionals
- adopt lifestyles that promote health
- manage the impact of the condition on your physical, emotional and social life
- follow your care plan, that has been developed in partnership with your health professional.

The course runs for 2–2.5 hours each week, for six weeks in a safe, non-judgmental environment. For further information go to: www.centralhealth.org.nz/?News.



In 2012, the **Ministry of Health** commissioned the New Zealand Guidelines Group to publish a review of the literature surrounding the effectiveness of behaviour change, including possible interventions. These include:

- RapidE: Chronic Care: A systematic review of the literature on health behaviour change for chronic care
- Effective health behaviour change in long-term conditions: A review of New Zealand and international evidence
- case studies of five New Zealand interventions:
 - Case study 1: The Heart Guide Aotearoa (HGA) Programme
 - Case study 2: The Diabetes Self-management Education programme
 - Case study 3: Māori Diabetes Self-management Education
 - Case Study 4: The Samoan Self-management education programme for people with long term conditions
 - Case study 5: Implementation of the Flinders program by a Primary Health Organisation
 - Health literacy Interventions: A brief summary.

These documents can be found at www.health.govt.nz/publication/effective-behaviour-change-long-term-conditions.



Assessment tools

Structure

The National Health Service (NHS)/Diabetes UK developed a resource for evaluating patient diabetes education: **Assessment of Patient Education in Diabetes in Scotland & Tool for the Assessment of Patient Education in Diabetes in Scotland** (2012). It contains guidance on quality assurance and measurement and can be accessed at: www.diabetesinscotland.org.uk/Publications/211112Diabetes%20-%20ADEPTS_TADEPTS-web-revised.pdf.

Assessment of Primary Care Resources and Supports for Chronic Disease Self-Management (PCRS): Assessment of how well general practice services are structured to provide long term condition care can be useful to identify gaps and required improvements. The following tool was developed for primary health care settings interested in improving self-management support systems and service delivery (2006 by the *Diabetes Initiative* with support from the Robert Wood Johnson Foundation® in Princeton, New Jersey. Revised December 2008. Copyright© 2006 Washington University School of Medicine in St Louis). It is to be used with primary health care multidisciplinary teams (eg, medical practitioners, nurses, dietitians, social workers, community health workers or others) that work together to manage patients' health care and assist them to focus on actions that can be taken to support self-management by patients with diabetes and/or other chronic conditions. It is suggested that teams use it periodically (eg, quarterly, semi-annually) as a way to monitor their progress and guide the integration of self-management supports into their system of health care. <http://improveselfmanagement.org/PCRS.pdf>.

Outcomes

When considering a structured education programme, the Scottish Intercollegiate Guidelines Network (SIGN) Clinical Guidelines for the Management of Diabetes (2010) state, ‘the lack of head-to-head comparative trials renders it impossible to recommend one specific programme over another. Therefore, it is important to consider the outcomes that are desirable for the population being treated and to consider whether the trial data support the delivery of those outcomes for that population’ (p 10).

The **American Association of Diabetes Educators** (AADE) published the updated Diabetes Self-Management Education and Training (DSME/T) Core Outcomes Measures Technical Review. This document is composed of six parts: 1) Background, 2) Defining Outcomes, 3) Outcomes Associated with Diabetes Self-Management Education and Training (DSME/T), 4) Assessment for Continuous Quality Improvement (CQI), 5) Self-Care Behaviour Outcomes, and 6) Summary and Conclusion. It builds upon the earlier technical review, and it is further supported by AADE practice documents and seven systematic reviews. It also complements the ‘Standards for Outcomes Measurement for Diabetes Self-Management Education and Training’ position statement that provides a framework for educators and DSME/T stakeholders to use as a guide in assessing the value and effectiveness of DSME/T. www.diabeteseducator.org/export/sites/aade/_resources/pdf/general/Outcomes_Technical_Review_Aug_2013.pdf.

Because of the complex nature of DSME, it draws upon a variety of outcome metrics, including those that measure educational, behavioural, clinical health status, utilisation cost, and satisfaction. The AADE recommend application of seven core behavioural outcomes/performance measures to evaluate the effectiveness of DSME: 1) Being active: Physical activity; 2) Healthy eating; 3) Monitoring; 4) Taking medication; 5) Problem solving; 6) Reducing risks; and 7) Healthy coping.



Resources

The **Health Mentor Online** resource for people with diabetes has been developed to help people with diabetes gain knowledge and self-management skills. Its content is quality assured by the New Zealand Society for the Study of Diabetes. It can be accessed at: www.healthmentoronline.com

Health Navigator New Zealand developed a Self-Management Support Toolkit (2012). It provides practical tools, resources, programme information and examples to help teams apply evidence and knowledge-based approaches to self-management support. Over time, it is hoped this toolkit can be localised for different regions of the country as well as updated, revised and refined to become an essential guide to self-management support for health care teams throughout New Zealand. It can be accessed at: www.healthnavigator.org.nz/self-management/resourcestoolkit/.

The **Institute for Health Care Improvement** has developed a toolkit for clinicians to assist the partnering in self-management support. It can be accessed at: www.ihc.org/resources/Pages/Tools/SelfManagementToolkitforClinicians.aspx.

The **World Health Organization**'s document 'Making health services adolescent friendly' contains useful guidance on tailoring services to meet the specific needs of adolescents. This guidebook sets out the public health rationale for making it easier for adolescents to obtain the health services that they need to protect and improve their health and wellbeing, including sexual and reproductive health services. It defines 'adolescent-friendly health services' from the perspective of quality, and provides step-by-step guidance on developing quality standards for health service provision to adolescents. Drawing upon international experience, it is also tailored to national epidemiological, social, cultural and economic realities, and provides guidance on identifying what actions need to be taken to assess whether appropriate standards have been achieved. The guidebook is intended to be a companion to the 'Quality Assessment Guidebook: A guide to assessing health services for adolescent clients,' which was published by the World Health Organization (WHO) in 2009. These two guidebooks are part of a set of tools to standardise and scale up the coverage of quality health services to adolescents, as described in another WHO publication, 'Strengthening the health sector's response to adolescent health and development'. It can be accessed at:

www.who.int/maternal_child_adolescent/documents/adolescent_friendly_services/en/



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Standard 2

People with diabetes should receive personalised advice on nutrition and physical activity together with smoking cessation advice and support if required.

Key practice points

- Information provided to people with diabetes should be consistent and based on contemporary guidelines.
- Information should be tailored to an individual's diagnosis (ie, type 1 or 2 diabetes) and circumstances.
- Advice can be provided on an individual basis or in a group setting.
- Nutritional and physical activity advice is most effective when delivered as a package.
- Smoking cessation and other forms of treatment should be a routine component of diabetes care and strongly and repeatedly recommended at any level of cardiovascular disease (CVD) risk.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that staff provide access to personalised advice on nutrition and physical activity from an appropriately trained health care professional or as part of a structured educational programme.

Health care professionals ensure that personalised advice on nutrition and physical activity is provided to the person with diabetes and their carer/family/whānau when required.

Planners and funders ensure a diabetes care pathway is in place that incorporates access to personalised advice on nutrition and physical activity from an appropriately trained health care professional or as part of a structured educational programme.

People with diabetes are given advice on diet and exercise from a trained health care professional or as part of their diabetes course.

Definition

An appropriately trained health care professional is one with specific expertise and competencies in nutrition. In most instances this will be a registered dietitian who delivers nutritional advice on an individual basis or as part of a structured educational programme.



Introduction

Nutrition

All New Zealanders with type 1 diabetes should be referred for personalised dietary advice from a registered dietitian upon diagnosis and on an ongoing basis as required. People with type 2 diabetes should also have access to nutritional advice from an appropriately trained health professional in either a one-to-one or group consultation. Personalised advice on food and nutrition should be tailored and meaningful to the person with diabetes and their family/whānau, provided in a form that is sensitive to the person's needs, culture and beliefs, and sensitive to their willingness to change, and should have an effect on their quality of life (National Institute for Health and Care Excellence [NICE] CG87 2009).

Evidence is strong that diabetes-specific dietary advice (including medical nutrition therapy) provided by registered dietitians is an effective and essential therapy in the management of diabetes (Andrews et al 2011; Coppell et al 2010; Franz et al 2010). Furthermore, diabetes-specific dietary advice can improve clinical and metabolic outcomes associated with diabetes and cardiovascular risk, such as glycaemic control, dyslipidaemia, hypertension and obesity, as well as overall nutrition status (American Diabetes Association 2008; Evert et al 2013; Franz 2002; Franz et al 2010).

To support people making healthy food choices and positive changes to their diet over the long term, it is important that all health care professionals working with people with diabetes have a thorough understanding of the New Zealand cardioprotective dietary pattern. This is summarised in the Heart Foundation's 'Nine Steps for Heart Healthy Eating':

- Enjoy three meals a day, select from dishes that include plant foods and fish, and avoid dairy fat, meat fat or deep fried foods.
- Choose fruits and/or vegetables at every meal and for most snacks.
- Select whole grains, whole grain breads or high-fibre breakfast cereals in place of white bread and low-fibre varieties at most meals and snacks.
- Include fish or dried peas, beans and soy products, or a small serving of lean meat or skinned poultry, at one or two meals each day.
- Choose low-fat milk, low-fat milk products, and soy or legume products every day.
- Use nuts, seeds, avocado, oils or margarine instead of animal and coconut fats.
- Drink plenty of fluids each day, particularly water, and limit sugar-sweetened drinks and alcohol.
- Use only small amounts of sugar or salt when cooking and preparing meals, snacks or drinks (if any). Choose ready-prepared foods low in saturated fat, sugar and sodium.
- Mostly avoid, or rarely include, butter, deep-fried and fatty foods and only occasionally choose sweet bakery products or pastries.

For further information: www.heartfoundation.org.nz/shop/product_view/891/a-guide-to-heart-healthy-eating-booklet.

Details of the New Zealand cardioprotective dietary pattern are also outlined in the **New Zealand Primary Care Handbook 2012**, which gives all health care professionals a useful evidence-based guideline when offering dietary advice to people with diabetes. All people with diabetes should receive written resources to support their learning around dietary recommendations, with signposting to evidence-based dietary resources accessible via reputable websites/applications etc.

According to the **Scottish Intercollegiate Guidelines Network (SIGN) (2010)** and the **American Diabetes Association (2014)**, dietary advice as part of a comprehensive management plan is recommended to improve glycaemic control for all people with type 1 or type 2 diabetes. Furthermore, it is recommended that nutrition therapy is individualised to the person with diabetes to be most effective (Evert et al 2013; Franz et al 2014).

Achieving nutrition-related goals requires a multidisciplinary team approach, with participation by the person with diabetes in planning and agreeing on goals (see Standard 3). Nutrition management has shifted from what was previously a prescriptive one-size-fits-all approach to focus on the person with diabetes and what is pertinent to their needs in the context of their family/whānau environment. With a focus on active patient participation, it puts the person at the centre of their care and enables recommendations to be tailored to their personal preferences and encourages joint decision-making (Dyson et al 2011).

For people with type 2 diabetes, in addition to learning about the New Zealand cardioprotective dietary pattern, specific advice regarding carbohydrate and alcohol intake, meal patterns and weight management are recommended (NICE CG87 2009). In the primary care setting, diabetes specialist dietitians are involved in the following:

- supporting primary care teams
- advising individuals with pre-diabetes and newly diagnosed type 2 diabetes
- providing assessment prior to insulin transfer for people with type 2 diabetes and offering support during the process, especially with regard to glycaemic control and weight (Diabetes UK Task and Finish Group 2010).

For type 1 diabetes, specialist dietetic advice should be provided by a dietitian with expertise in type 1 diabetes (for young people, see Standard 16) (NICE CG15 2004). Diabetes specialist dietitians have additional training and skills for the following (Diabetes UK Task and Finish Group 2010):

- providing education on carbohydrate counting and supporting individuals with type 1 diabetes to adjust their insulin, manage their pump therapy and might include hypoglycaemia awareness therapy
- supporting antenatal and postnatal care
- working with young people with diabetes who may have significant eating problems or weight and glycaemic control issues
- supporting inpatient care, including complex nutritional care such as those who are enterally fed or have pancreatitis
- advising people with complex problems such as gastroparesis and renal disease
- supporting the assessment of individuals who are considering bariatric surgery and providing follow-up care if appropriate.

Children and adolescents with diabetes (type 1 or type 2) should be seen by a dietitian with specialist skills in both paediatric and diabetes management (ISPAD 2009). Young people with type 2 diabetes are at significant risk of macro- and microvascular complications (Constantino et al 2013) and should be referred to a specialist diabetes team for dietetic input.

Carbohydrate counting is an essential skill to support intensified insulin management in type 1 diabetes (DAFNE Study Group 2002), either by multiple daily injections (MDI) or continuous subcutaneous insulin infusion (CSII). To achieve this, all patients must be able to access such training locally, and ideally, at their own diabetes clinic (SIGN 2010).

Physical activity

Exercise has many positive health and psychological benefits, including physical fitness, weight management, and enhanced insulin sensitivity (Chiang et al 2014). Therefore, exercise should be a standard recommendation, as it is for people without diabetes; however, modifications may need to be made for people with diabetes, due to the presence of diabetes complications and risk of hypoglycaemia or hyperglycaemia (Chiang et al 2014). According to New Zealand guidelines, a minimum of 30 minutes of moderate intensity physical activity on most days of the week is recommended.

Smoking cessation

Smoking kills an estimated 5000 people in New Zealand every year, and smoking-related diseases are a significant cost to the health sector. Most smokers want to quit, and there are simple effective interventions that can be routinely provided in both primary and secondary care (Ministry of Health 2014). There are consistent results from both cross-sectional and prospective studies showing enhanced risk for micro- and macrovascular disease, as well as premature mortality from the combination of smoking and diabetes (Ciccolo et al 2014). New Zealand guidelines state, 'smoking cessation has major benefits and immediate health benefits for all smokers' (New Zealand Guidelines Group 2012, p 25). Therefore, smoking cessation and other forms of treatment should be a routine component of diabetes care (American Diabetes Association 2014) and strongly and repeatedly recommended at any level of CVD risk.

All guidelines recommend that all people who smoke should be advised to quit and offered treatment to help them stop completely. A Cochrane review (Stead et al 2008) of nicotine replacement therapy (NRT) for smoking cessation concluded that: 'All of the commercially available forms of NRT (gum, transdermal patch, nasal spray, inhaler and sublingual tablets/lozenges) can help people who make a quit attempt to increase their chances of successfully stopping smoking. NRTs increase the rate of quitting by 50–70%, regardless of setting. The effectiveness of NRT appears to be largely independent of the intensity of additional support provided to the individual. Provision of more intense levels of support, although beneficial in facilitating the likelihood of quitting, is not essential to the success of NRT' (Stead et al 2008, p 2).

In a more recent review of behavioural interventions to support smoking cessation, pharmacotherapy (both prescription and over-the-counter) and behavioural support were identified to aid cessation, and their combination is more effective than either alone (Ciccolo and Busch 2014).



Guidelines

The **New Zealand Primary Care Handbook 2012** provides summary guidance from a collection of guidelines and is intended as a convenient reference for health professionals and can be accessed here: www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012.

The 2012 edition includes content on the management of type 2 diabetes, weight management, stroke and transient ischaemic attack, heart failure and rheumatic fever. It covers recommendations for best practice for weight management, physical activity and smoking cessation.

While the New Zealand Primary Care Handbook 2012 remains the main reference for health care practitioners, the Cardiovascular Disease Risk Assessment (updated 2013) provides updates for CVD risk assessment, management and diabetes screening advice. This guide helps support teams and practitioners to deliver more heart and diabetes checks for their patients. In addition to the guide, a quick reference sheet summarises the key updates. An online version of the handbook and the 2013 updates are available on the Ministry of Health website: www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012

Weight management

Clinical Guidelines for Weight Management in New Zealand Adults (2009)
www.health.govt.nz/system/files/documents/publications/weight-management-adults-guidelines.pdf8

The aim of this guideline is to provide evidence-based guidance for weight management in adults. It is expected that this guideline will be used principally in primary care and community-based initiatives. Primary prevention of overweight and obesity, although vitally important, is outside the contracted scope of this guideline. This guideline stands alongside a guideline developed for weight management in children and young people. The guideline provides specific advice about improving weight management outcomes for Māori, Pacific and South Asian populations as a priority. It identifies that good practice that reflects the rights, needs, culture and context of priority populations can improve the uptake and impact of guideline-based interventions. The guideline emphasises the importance of involving others as appropriate (eg, spouse, family/whānau) and achieving mana-enhancing relationships through a responsive health system at all stages of the algorithm. Mana-enhancing relationships are ones where there is genuine respect for the person with weight-related risks and a sense of collaboration that connects with deeper values and beliefs to achieve behaviour change.

Smoking cessation

The New Zealand Guidelines for Helping People to Stop Smoking (2014) provides health care workers with advice they can use when dealing with people who smoke. These Guidelines replace the 2007 New Zealand Smoking Cessation Guidelines, and are based on a recent review of the effectiveness and affordability of stop-smoking interventions. The guidelines remain structured around the ABC pathway, which was introduced in the 2007 Guidelines. However, the definitions of A, B and C (see below) have been improved to emphasise the importance of making an offer of cessation support and referring people who smoke to a stop-smoking service.

The ABC pathway

- **Ask** about and document every person's smoking status.
- Give **Brief advice** to stop to every person who smokes.
- Strongly encourage every person who smokes to use **Cessation support** (a combination of behavioural support and stop-smoking medicine works best) and offer to help them access it. Refer to, or provide, cessation support to everyone who accepts your offer.

The guidelines include several important messages:

- Health care workers should give brief advice to stop smoking to all people who smoke, regardless of whether they say they are ready to stop smoking or not.
- Provide evidence-based cessation support for those who express a desire to stop smoking.
- Health care workers should only recommend smoking cessation treatments of proven effectiveness, as identified in these guidelines, to people interested in stopping smoking.

The New Zealand Guidelines for Helping People to Stop Smoking. Wellington: Ministry of Health (www.health.govt.nz/publication/new-zealand-guidelines-helping-people-stop-smoking).



Implementation advice

Nutritional advice

Diabetes services should be adequately resourced with registered dietitians who have appropriate training and experience in diabetes prevention and management. When commissioning specialist diabetes services for adults with diabetes, international recommendations state there should be at least at least four whole-time equivalent (WTE) registered dietitians with specialist skills in diabetes for a total population of 250,000 people, with an average of 5% prevalence of diabetes (Commissioning Specialist Diabetes Services for Adults with Diabetes – a Diabetes UK Task and Finish Group Report 2010). This should be upwardly adjusted based on local demographic need (eg, areas with a diabetes prevalence above the national average) and/or increasing prevalence of diabetes and obesity. Local models of care should reflect registered dietitian full-time equivalent (FTE) ratios and be integrated into clinical care pathways, (eg, Map of Medicine see MidCentral and Waikato DHBs).

- www.nursingreview.co.nz/issue/may-2012/map-of-medicine-development-at-midcentral-dhb/#.U97BPpSSwwc.
- www.waikatodhb.health.nz/about-us/news-and-events/news/midland-dhbs-join-together-with-map-of-medicine/.

As nutritional advice is different for type 1 diabetes, type 2 diabetes, diabetes in pregnancy and across the lifespan, it is important that registered dietitians have the appropriate knowledge and skills to practice competently at the level their role requires. Given the growing prevalence and complexity of diabetes referrals, it is essential that primary, secondary and specialist services are adequately resourced with dietitians who are experts in diabetes and nutritional advice, understand the broader complexities of living with diabetes and also have advanced skills in communication and adult education. With adequate resourcing, dietitians may then be available to support other providers of diabetes care to develop fundamental nutrition knowledge and skills so that, wherever people are accessing care, consistent and accurate dietary advice can be imparted. Implementation of an Integrated Knowledge, Skills and Career Pathway framework is currently being developed for New Zealand dietitians working in diabetes care.

Physical activity

Local arrangements need to be in place to ensure that people with diabetes receive personalised advice on physical activity from an appropriately trained health care professional, or as part of a structured educational programme.

Smoking cessation

Comprehensive implementation guidance is provided here:

www.health.govt.nz/publication/new-zealand-guidelines-helping-people-stop-smoking.

Implicit within the Guidelines for Helping People to Stop Smoking is an assumption that health care workers have the prerequisite knowledge, attitudes and skills to support smokers in ways that maximise the smokers' chances of stopping smoking permanently.



Implementation examples / innovations



UCOL U-Kinetics

The UCOL U-Kinetics Exercise and Wellness Centre is an innovative approach to providing specialist exercise physiology services to clients with a range of medical conditions (including type 1 and 2 diabetes) or musculo-skeletal injuries, using highly qualified clinical exercise physiologists, in conjunction with UCOL postgraduate clinical exercise physiology students.

Clients complete specialised exercise assessments and undertake personalised and highly supervised exercise programmes delivered in a safe, state-of-the-art facility. Data from the referral letter, initial consultation (including questionnaire results), and exercise assessment are essential for knowing the client's current state of health and how to safely exercise the client in the clinic through identification of their exercise symptom limits. The exercise assessment includes a range of measures, including submaximal exercise testing (with resting and exercise 12-lead ECG), blood pressure responses, body composition, balance, and for diabetics, acute blood glucose responses to exercise.

Clients are prescribed a 12-week supervised exercise programme, incorporating components of aerobic fitness, strength, balance and flexibility. At each session, the clients are checked before, during and following each session – for people with diabetes, this includes measurement of blood glucose level, heart rate, blood pressure, and other measures depending on their comorbidities (eg, 30-second ECG if cardiac problems, pulse oximetry if respiratory issues), along with utilising scales during exercise, such as perceived exertion, to ensure they are responding appropriately to their exercise workload. During their programme at U-Kinetics clients are encouraged to learn and understand 'their numbers' (glucose levels, blood pressure, exertion levels, etc) and how lifestyle changes can improve their self-management of their condition, and minimise risk of future complications.

U-Kinetics is an innovative and unique collaboration between UCOL, MidCentral District Health Board (DHB) and The Back Institute (TBI) Health, combining education and health, and collaboration between both public and private providers with a focus on achieving significant health outcomes for all clients. For diabetes, there is a close working relationship with both the MidCentral DHB Diabetes and Endocrinology Service and the diabetes services for the Central Primary Health Organisation (PHO). U-Kinetics is a demonstration site for Health Workforce NZ, showcasing the role of an exercise specialist within health and rehabilitation, and it provides an excellent learning environment for both clients and UCOL postgraduate students. The knowledge and skills that graduates of the programme have obtained will enable them to play an important role within the community, utilising exercise to help clients manage their chronic medical conditions and injuries.

For further information: www.u-kinetics.co.nz/.



The Green Prescription

The Green Prescription (GRx) initiative is a health professional’s written advice to a patient or their family to encourage and support them becoming more physically active as part of a total health plan. The scheme encourages general practitioners to target several medical conditions associated with inactivity, and has been used by over 80% of New Zealand general practitioners. The initiative consists of two components: GRx (for adults) and the GRx Active Families programme that aims to increase physical activity for children, young people and their families, and was introduced in 2004.

Information on the Green Prescription can found here:

- www.health.govt.nz/our-work/preventative-health-wellness/physical-activity/green-prescriptions/how-green-prescription-works.
- www.health.govt.nz/our-work/preventative-health-wellness/physical-activity.



Assessment tools

Nutritional advice / physical activity

Structure

Evidence of local arrangements to ensure that people with diabetes receive personalised advice on nutrition and physical activity from an appropriately trained health care professional, or as part of a structured educational programme.

Process:

- (a) The proportion of people with type 1 diabetes and youth with type 2 diabetes who receive personalised advice on nutrition at diagnosis and then ongoing review, from a registered dietitian.

Numerator	The number of people in the denominator receiving personalised advice on nutrition from a registered dietitian
Denominator	The number of people with type 1 diabetes and youth with type 2 diabetes

The proportion of people with type 2 diabetes who receive personalised advice on nutrition within one year of diagnosis and review as needed, from either a registered dietitian or an appropriately trained health care professional.

Numerator	The number of people in the denominator receiving personalised advice on nutrition from an appropriately trained health care professional
Denominator	The number of people with type 2 diabetes

- (b) The proportion of people with diabetes who receive personalised advice on physical activity.

Numerator	The number of people in the denominator receiving personalised advice on physical activity
Denominator	The number of people with diabetes



Resources

Smoking cessation

- **Ministry of Health – Health targets: Better help for smokers to quit**
 - 95% percent of hospitalised patients who smoke and are seen by a health practitioner in public hospitals and 90% of enrolled patients who smoke and are seen by a health care practitioner in general practice are offered brief advice and support to quit smoking.
 - 90% of pregnant women (who identify as smokers at the time of confirmation of pregnancy in general practice or booking with a lead maternity carer) are offered advice and support to quit.
- **Ministry of Health Food and Nutrition Guidelines**
www.health.govt.nz/our-work/preventative-health-wellness/nutrition/food-and-nutrition-guidelines
- **Heart Foundation guide to healthy heart eating**
www.heartfoundation.org.nz/shop/product_view/891/a-guide-to-heart-healthy-eating-booklet
- **Sport New Zealand**
www.sportnz.org.nz
- **Diabetes New Zealand**
www.diabetes.org.nz/living_with_diabetes/type_2_diabetes/smoking
- The **Ministry of Health** website has the following documents available to download at: www.health.govt.nz/publication/new-zealand-guidelines-helping-people-stop-smoking:
 - The New Zealand Guidelines for Helping People to Stop Smoking (docx, 218 KB)
 - The New Zealand Guidelines for Helping People to Stop Smoking (pdf, 1 MB)
 - Background and Recommendations of The New Zealand Guidelines for Helping People to Stop Smoking (pdf, 1.7 MB)
 - Background and Recommendations of The New Zealand Guidelines for Helping People to Stop Smoking (docx, 298 KB)
 - Guide to Prescribing Nicotine Replacement Therapy (docx, 388 KB)
 - Guide to Prescribing Nicotine Replacement Therapy (pdf, 867 KB)

- The ABC Pathway: Key messages for frontline health care workers (docx, 93 KB)
- The ABC Pathway: Key messages for frontline health care workers (pdf, 820 KB)
- Smokefree Nurses Aotearoa/New Zealand
www.smokefreenurses.org.nz/ABCQUIT+CARDS.html

Online learning

- **HealthEd** Health Promotion Agency and the Ministry of Health
A catalogue of health resources
<https://www.healthed.govt.nz>
- **Health Mentor Online:** For registered health care professionals
www.pro.healthmentoronline.com
- **Health Mentor Online:** For people with diabetes
www.healthmentoronline.com
- **Diabetes New Zealand**
www.diabetes.org.nz



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Standard 3

People with diabetes should be offered, as a minimum, an annual assessment for the risk and presence of diabetes-related complications and for cardiovascular risk. They should participate in making their own care plans, and set agreed and documented goals/targets with their health care team.

Key practice points

- People with diabetes are at increased risk of microvascular and macrovascular complications and, therefore, should be offered assessment for risk and presence of complications.
- The risk of complications varies greatly across the diabetic population.
- Young people with type 2 diabetes have a high risk of morbidity and mortality.
- The aim is prevention of complications, especially targeting those at high risk.
- Patients with existing complications (eg, foot, eye, kidney or cardiovascular disease) are in a high-risk category and should be managed intensively.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure people with diabetes are offered, as a minimum, an annual assessment for the risk and presence of diabetes-related complications and for cardiovascular risk. In addition, people with diabetes should be enabled to participate in annual care planning with documented agreed goals and an action plan, and to support this, training is provided for health care professionals.

Health care professionals ensure they are competent to undertake support an annual assessment for the risk and presence of diabetes-related complications and for cardiovascular risk and practice in a way that enables people with diabetes to participate in their care, including agreeing on specific achievable goals and an action plan in annual care planning.

Funders and planners ensure services are commissioned that ensure people with diabetes have access to an annual assessment for the risk and presence of diabetes-related complications and for cardiovascular risk and delivered in a way that people with diabetes are encouraged to participate in their own care.

People with diabetes have access to an annual assessment for the risk and presence of diabetes-related complications and for cardiovascular risk, and are involved in annual planning for their own care, which includes agreeing on the best way to manage their diabetes and setting personal goals.

Definitions

Diabetes-related complications are a result of the damaging effects of hyperglycaemia that can be divided into macrovascular complications (coronary artery disease, peripheral arterial disease, and stroke) and microvascular complications (diabetic nephropathy, neuropathy, and retinopathy) (Fowler 2008).

Care planning is defined as a process that actively involves people in deciding, agreeing and sharing responsibility for how to manage their diabetes. It aims to help people with diabetes achieve optimal health by partnering with health care professionals to learn about, manage, and cope with diabetes and its related conditions in their daily lives.

Care planning is underpinned by the principles of patient-centredness and partnership. It is an ongoing process of communication, negotiation and joint decision-making in which both the person with diabetes and the health care professional(s) make an equal contribution to the consultation (Joint Department of Health and Diabetes UK Care Planning Working Group, 2006).



Introduction

Cardiovascular disease morbidity and mortality rates are two to five times higher in people with diabetes compared to people without diabetes. Women with diabetes have a higher relative risk of death from cardiovascular disease when compared to men with diabetes, however the absolute risk is lower. The excess mortality associated with diabetes is evident in all age groups but is particularly high in young people with type 1 diabetes (Scottish Intercollegiate Guidelines Network 2010). Young people with type 2 diabetes are at increased of greater mortality, more complications and unfavourable cardiovascular risk factors compared to young people with type 1 diabetes (Constantino et al 2013).

The traditional clinical consultation involves the gathering, sharing and discussing information, deciding the issues, and developing a plan. Care planning in addition involves encompassing the patient views and including a much wider range of issues across all aspects of a person's life. It takes into account their condition, and their personal goals are central to the action plans developed. In diabetes, care planning replaces the traditional annual review which can become a 'tick box' activity, with a 'conversation' that is more satisfactory and effective for everyone (Diabetes UK, NHS National Diabetes Support Team, Department of Health, and Health Foundation 2008).

When setting targets or goals, these should be specific to the individual, and set as part of the process of the care planning while assessing the clinical needs of the patient. The specific goals and expectations will differ significantly between a healthy 26-year-old and a frail 86-year-old with diabetes related complications (Chiang et al 2014).

People with diabetes are at increased risk of developing micro and macrovascular complications, plus poor glycaemic control and/or hypertension may impact on the advancement or management of co-morbidities or co-existing conditions. The New Zealand Primary Care Handbook (2012, p 49) states that an annual assessment for determining level of risk for macrovascular and microvascular complications is a key component of treatment planning and target setting for each individual with type 2 diabetes.

It notes that:

- the risk of complications varies greatly across the diabetic population
- the aim is prevention of complications, especially targeting those at high risk
- patients with existing complications (eg, foot, eye, kidney or cardiovascular disease) are in a high-risk category and should be managed intensively



Guidelines

In New Zealand, cardiovascular risk assessment is recommended annually for people with type 1 or type 2 diabetes from time of diagnosis, and includes a lipid profile, HbA1c, and blood pressure (Cardiovascular Disease Risk Assessment Steering Group 2013).

The **New Zealand Primary Care Handbook 2012** recommends people with existing diabetes should attend at least six-monthly for a review of HbA1c and blood pressure; annual review of lipids, ACR, eGFR and foot check; and two-yearly retinal screening (see Standards 4–6 and 9–11).

Psychological status

The **American Diabetes Association** and **Scottish Intercollegiate Guidelines Network** (SIGN) guidelines also recommend assessing psychological status annually and more often as needed, treating and referring to a mental health professional if indicated (Chiang et al 2014) (see Standard 4). In particular, the SIGN guidelines recommend a regular assessment of a broad range of psychological and behavioural problems in children and adults with type 1 diabetes. In children, this should include eating disorders, behavioural, emotional and family functioning problems. For adults, this should include anxiety, depression and eating disorders.

Children

The **Paediatric Society of New Zealand** and **Starship Foundation** (2013) recommends the following:

- **Retinal screening** – one- to two-yearly, beginning two years after diagnosis, in adolescents – one to two yearly, beginning five years after diagnosis or from age 9 years in children (see Standard 16).
- **Kidney health** – regular screening for protein in the urine (microalbuminuria) is recommended once a year, beginning two years after diagnosis, in adolescents – once a year, beginning five years after diagnosis or from age 9 years in children.
- **Vascular disease** – a young person with type 2 diabetes has an increased risk of complications at an earlier age.
- **Hypertension** – blood pressure should be checked at time of diagnosis and then every year.
- **Cholesterol or lipids** – every five years from time of diagnosis or from 12 years age then annually after puberty.

Care planning and goal/target setting

The National Institute for Health and Care Excellence guidelines (2010) recommend the following.

An individual care plan should be set up and reviewed annually, modified according to changes in wishes, circumstances and medical findings, and the details recorded. The plan should include aspects of:

- diabetes education including nutritional advice (see Standard 1)
- insulin therapy (see Standard 7)
- self-monitoring (see Standard 5)
- arterial risk factor surveillance and management (see Standards 5 and 6)
- late complications' surveillance and management (see Standards 9–12).

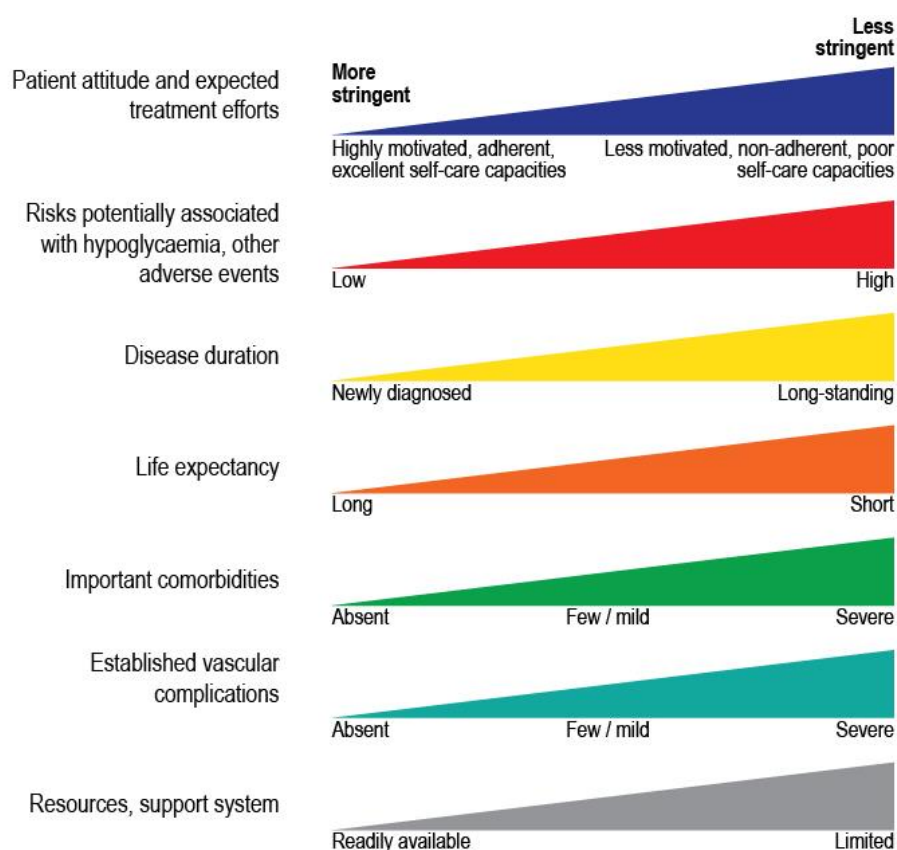
It is also recommended that population, practice-based and clinic diabetes registers be used to assist programmed recall for annual review and assessment of complications and vascular risk (NICE 2010).

The NZ Primary Care Handbook 2012 outlines the following:

- Approach to setting treatment targets:
 - setting treatment targets is an important component of diabetes management for all patients
 - targets given for specific parameters are based on best available evidence, but should be appropriate for the individual patient.
- Treatment targets to address risk factors:
 - targets should be appropriate for, and agreed with, the individual patient
 - treatment targets should be set for an individual in order to balance benefits with harms, in particular hypoglycaemia and weight gain
 - glycaemic control target: HbA1c 50–55 mmol/mol or as individually agreed
 - it is important to consider patient age. In younger people, tighter control should be considered given their higher lifetime risk of diabetes-related complications
 - any reduction in HbA1c is beneficial
 - good glycaemic control has a clear benefit on microvascular outcomes and if started early enough, on long term macrovascular outcomes
 - blood pressure (BP) target: <130/80 mm Hg. Evidence suggests a BP target <120 mm Hg may be harmful. Care should be taken to estimate likely treatment response for patients when BP approaches the target of <130 mm Hg
 - lipids target: triglycerides <1.7 mmol/L; total cholesterol <4.0 mmol/L.

Inzucchi et al (2012) provide the following guidance for managing hyperglycaemia, based on **American Diabetes Association** guidelines. They describe the figure as a 'depiction of the elements of decision-making used to determine appropriate efforts to achieve glycaemic targets. Greater concerns about a particular domain are represented by increasing height of the ramp. Thus, characteristics/predicaments toward the left justify more stringent efforts to lower HbA1c, whereas those toward the right are compatible with less stringent efforts. Where possible, such decisions should be made in conjunction with the patient, reflecting his or her preferences, needs, and values. This 'scale' is not designed to be applied rigidly but to be used as a broad construct to help guide clinical decisions' (p 1366).

Figure 2: Approach to management of hyperglycaemia



The **American Association of Clinical Endocrinologists** outlines the following in their guideline for developing a diabetes mellitus (DM) care plan: Every patient with documented DM requires a comprehensive care plan, which takes into account the individual's medical history, behaviours and risk factors, ethnic and cultural background, and environment. Glucose targets should take into account remaining life expectancy, duration since diagnosis, presence or absence of microvascular and macrovascular complications, cardiovascular risk factors, comorbid conditions and risk for severe hypoglycaemia.



Implementation advice

'People with diabetes are in charge of their own lives and self-management of their diabetes, and are the primary decision-makers about the actions they take in relation to their diabetes management' (Diabetes UK et al 2008, p 39).

Care planning consultations should be available to all people with diabetes and reflect the information needed, as well as both technical and emotional support to enable the person with diabetes to make the best decisions about their care (Diabetes UK et al 2008; NICE 2011). The person with diabetes is more likely to undertake action if it is related to decisions they have made, rather than decisions made for them (Diabetes UK et al, 2008).

People with diabetes need to be orientated to the care planning approach and what to expect. Health professional should undertake further training in developing patient-centred interventions if required (Scottish Intercollegiate Guidelines Network 2010). If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care and given the information and support they need (NICE 2009).

At each care planning consultation, time should be allowed to share information about issues and concerns, share results of biomedical tests, discuss the experience of living with diabetes and address needs to manage obesity, food and physical activity. The person with diabetes should receive help to access support and services, and, agree to a plan for managing diabetes that addresses the individual priorities and goals. These should be jointly agreed, including jointly setting a goal for HbA1c. Specific actions are in response to identified priorities that include an agreed timescale (Diabetes UK et al 2008; Joint Department of Health and Diabetes UK Care Planning Working Group 2006; NICE 2011).

This care planning approach will incorporate:

- nutritional advice
- discussing psychological wellbeing (identify support groups)
- managing obesity
- structured education
- screening for complications
- smoking cessation advice
- physical activity
- self-management programme
- agreeing goals for HbA1c
- agreeing plans for managing diabetes
- discussing goals
- follow-up support by telephone.

(Joint Department of Health and Diabetes UK Care Planning Working Group 2006.)

The documented individual care plan should be reviewed at least annually and modified according to any changes in wishes, clinical circumstance and medical findings (NICE 2004). In addition, diabetes registers should be established to support annual recall systems for surveillance of complications, cardiovascular risk, and for quality management (NICE 2004).

The shared treatment decisions should consider the individual's clinical state, age, comorbidities and frailty, personal preferences and available research evidence. The absolute benefits and harms of interventions must be considered, and it is acknowledged that people interpret these risks differently and will have their own inclinations and limits (Cardiovascular Disease Risk Assessment Steering Group 2013).

When setting a target HbA1c:

- involve the person in decisions about their individual HbA1c target level
- encourage the person to maintain their individual target, unless the resulting side-effects (including hypoglycaemia) or their efforts to achieve this impair their quality of life
- offer therapy (lifestyle and medication) to help achieve and maintain the HbA1c target level
- inform a person with a higher HbA1c that any reduction in HbA1c towards the agreed target is advantageous to future health
- avoid pursuing highly intensive management (NICE 2009).

A guide to implementing care planning in diabetes is available from Diabetes UK – www.diabetes.org.uk/documents/reports/careplanningdeco6.pdf (Joint Department of Health and Diabetes UK Care Planning Working Group 2006).



Implementation examples / innovations



The Year of Care (YOC) Programme (UK)

‘Working together for better health care and better self-care’

A section from the executive summary is below. Access to the full report is available here: www.diabetes.org.uk/upload/Professionals/Year%20of%20Care/YOC_Report.pdf.

The YOC Programme has demonstrated how to deliver personalised care in routine practice for people with long term conditions (LTCs), using diabetes as an exemplar. The approach puts people with LTCs firmly in the driving seat of their care and supports them to self-manage. It transforms the diabetes annual review into a constructive and meaningful dialogue between the health care professional and the person with diabetes. It has two components. Firstly, it enhances the routine biomedical surveillance and Quality and Outcomes Framework (QOF) review with a collaborative consultation, based on shared decision-making and self-management support, via care planning. Secondly, it ensures there is a choice of local services available to support people wanting to improve their health, wellbeing and health outcomes.

YOC provides practical evidence and support to implement the white paper *Equity and Excellence: Liberating the NHS* proposals for personalised care ‘no decision about me without me’ and locally-driven flexible commissioning for people with LTCs and the QIPP agenda. Care planning is included in the NICE Quality Standard for diabetes. YOC has worked closely with the Royal College of General Practitioners (RCGP), who are developing professional standards for care planning to be incorporated into training.

YOC makes available:

- a tested National Training and Support Programme to support delivery of care planning in primary and specialist care. This includes quality-assured ‘training the trainers’, facilitation of delivery, and links with unique IT templates to record patient goals, action plans and service needs
- the Royal College of General Practitioners’ (RCGP) report ‘Care Planning – Improving the Lives of People with Long Term Conditions’. This is a practical guide for clinical teams on putting the YOC care planning model into practice (Diabetes UK, NHS National Diabetes Support Team, Department of Health, and Health Foundation 2011).



Introducing personalised care planning into Newham: outcomes of a pilot project (Walker et al 2012)

This study explored the feasibility and acceptability of implementing a personalised care planning approach for diabetes care in general practice. A four-stage care planning process was introduced for diabetes annual review, involving patients (1) being made aware of the new process, (2) attending an appointment to gather clinical data, (3) receiving and reviewing their results, and (4) attending a care planning consultation. The latter is a collaborative discussion with the health professional about their response to their results, their goals and desired action plan. Health professionals received specialist training in personalised care planning, including practice observations and feedback. Introducing personalised care planning to general practice diabetes care was found to be possible and well received. The model for implementation of personalised care planning, which included specialty training for practice teams and ongoing support from local colleagues and health organisations, can help to meet national recommendations for the provision of personalised care plans for people with long-term

conditions. When implementing personalised care planning, efficient administration is vital, and behaviour change is necessary for both staff and patients.



Episode of Care programme

A new approach for managing diabetes in an integrated health care system in the USA is highly successful in improving the access to essential education about the management of this chronic condition and quality of diabetes care, in general. The programme was comprehensive and involved both patients and providers. It consisted of practice guidelines, medical screening, provider reports, diabetes education, focused clinic visits, easy access to care and reminder systems. Results indicated significant improvements in preventive screening, improved access to diabetes education, and lowering of HbA1c values (Friedman et al 1998).



Diabetes management in a health maintenance organisation (HMO)

Kaiser Permanente (Pleasanton, CA, USA), a large HMO in the USA, is using a population-based approach to improve outcomes for its 13,000 patients with diabetes. This innovative programme assists primary care teams to improve the delivery of diabetes care. Based on an integrated chronic care model, the programme includes an on-line registry of patients, evidence-based guidelines for routine diabetes care, improved support for patient self-management, and practice re-design that incorporates group visits. Results evidence improvements in the following areas:

- retinal screening rates increased from 56% to 70%
- renal screening rates increased from 18% to 68%
- foot exam rates increased from 18% to 82%
- HbA1c testing rates increased from 72% to 92%.

Synopsis: An evaluation of the effectiveness of a cluster visit model led by a diabetes nurse specialist for delivering outpatient care management to adult patients with poorly controlled diabetes aged 16–75 years who had either poor glycaemic control (HbA1c >69 mmol/mol) or no HbA1c test performed during the previous year. Intervention subjects received multidisciplinary outpatient diabetes care management delivered by a diabetes nurse specialist, a psychologist, a nutritionist, and a pharmacist in cluster visit settings of 10–18 patients/month for six months. This six-month cluster visit group model of care for adults with diabetes improved glycaemic control, self-efficacy, and patient satisfaction and resulted in a reduction in health care utilisation after the programme (Sadur et al 1999).



Assessment tools

Care planning

Structure

Evidence of local arrangements and provision of resources to ensure that people with diabetes participate in annual care planning that leads to documented agreed goals and an action plan.

Process

- (a) The proportion of people with diabetes who are offered annual care planning including documenting and agreeing goals and an action plan within the past year.

Numerator	The number of people in the denominator offered annual care planning including documenting and agreeing goals and an action plan within the past year
Denominator	The number of people with diabetes

- (b) The proportion of people with diabetes who participate in annual care planning including documenting and agreeing goals and an action plan within the past year.

Numerator	The number of people in the denominator participating in annual care planning including documenting and agreeing goals and an action plan within the past year
Denominator	The number of people with diabetes

Outcome

Patient satisfaction with diabetes care using validated patient survey criteria.

Setting goals/targets

Structure

Evidence of local arrangements to ensure that people with diabetes are able to agree with their health care professional on a documented personalised HbA1c target, and receive an ongoing review of treatment to minimise hypoglycaemia.

Process

- (a) The proportion of people with diabetes with a measured HbA1c within the past year.

Numerator	The number of people in the denominator with a measured HbA1c within the past year
Denominator	The number of people with diabetes

- (b) The proportion of people with diabetes who have an agreed target for HbA1c within the past year.

Numerator	The number of people in the denominator with an agreed target for HbA1c including a recently documented HbA1c within the past year
Denominator	The number of people with diabetes

- (c) The proportion of people with diabetes who have received a review of treatment to minimise hypoglycaemia in the previous 12 months.

Numerator	The number of people in the denominator receiving a review of treatment to minimise hypoglycaemia in the previous 12 months
Denominator	The number of people with diabetes

- (d) (Optional) The proportion of people with diabetes achieving their HbA1c target within the past year.

Numerator	The number of people in the denominator achieving their HbA1c target within the past year
Denominator	The number of people with diabetes

The proportion of people with diabetes with a documented HbA1c meeting agreed target within the past year.

Numerator	The number of people in the denominator with a documented HbA1c meeting agreed target
Denominator	The number of people with diabetes

Additional process measures:

- The percentage of patients with diabetes with a record of the presence or absence of peripheral pulses in the previous 15 months (see Standard 11).
- The percentage of patients with diabetes with a record of neuropathy testing in the previous 15 months (see Standard 11).
- The percentage of patients with diabetes who have a record of micro-albuminuria testing in the previous 15 months (see Standard 10).
- The percentage of patients with diabetes who have a record of retinal screening in the previous 15 months (see Standard 9).
- The percentage of patients with diabetes who have a record of estimated glomerular filtration rate in the previous 15 months (see Standard 9).



Resources

- **Cardiovascular disease (CVD) risk assessment calculator**
Online CVD risk assessment calculator. Hosted by NZSSD.
www.nzssd.org.nz/cvd/
- **Best Practice Advocacy Centre**
Clinical audit: Following up people with diabetes.
www.bpac.org.nz/Audits/docs/bpacnz_audit_diabetes_followup.pdf
- **Diabetes Resource Hub – NZ Health Improvement and Innovation Resource Centre**
www.hiirc.org.nz/page/41175/
- **Quality improvement in New Zealand health care**
Part 6: keeping the patient front and centre to improve health care quality
<http://journal.nzma.org.nz/journal/119-1242/2174/>

- **Michigan Diabetes Research and Training Centre**
Patient Care Handouts
www.med.umich.edu/mdrtc/profs/pt_handouts.html
- **Diabetes UK**
Contains information on what care planning is for the consumer (YouTube video).
www.diabetes.org.uk/Guide-to-diabetes/Monitoring/Interactions-with-healthcare-professionals/
- **Kidshealth.org.nz**
Information about children's health for New Zealand parents, caregivers, family and whānau
www.kidshealth.org.nz/#sthash.WqAoQKyH.dpuf
- **Health Mentor Online**
Information about diabetes for health care professionals
<http://pro.healthmentoronline.com/>
- **Information for people with diabetes**
www.healthmentoronline.com
- **Diabetes New Zealand**
Information about diabetes for people with diabetes
www.diabetes.org.nz



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Standard 4

People with diabetes should be assessed for the presence of psychological problems with expert help provided if required.

Key practice points

- People with diabetes are at higher risk of psychological problems, including depression and distress.
- Health care professionals should have skills to assess, manage or know how and where to refer for psychological problems.
- People accessing mental health services, especially those on antipsychotic medication, should be screened for diabetes.
- Ideally, psychological services will be delivered as part of the diabetes multidisciplinary team.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that diabetes services can assess and appropriately manage psychological problems (such as depression, anxiety, distress, fear of low blood sugar, eating disorders and problems coping with the diagnosis) in people with diabetes.

Health care professionals ensure that diabetes services can assess and appropriately manage psychological problems in people with diabetes.

Funders and planners ensure that diabetes services can assess and appropriately manage psychological problems in people with diabetes.

People with diabetes are assessed for psychological problems and any problems identified are properly managed.



Introduction

Depression, anxiety, distress and other disorders causing serious psychological distress (SPD) are known to frequently complicate the health care of people with diabetes (Anderson et al 2001; Fisher et al 2012; Grigsby et al 2002). Among the spectrum of psychological disorders, there is considerable literature to support an association between depression and diabetes (Goldney et al 2004). Depression is frequently cited to be more common in people with diabetes than in the general population and the presence of complications is associated with a lower quality of life (**Scottish Intercollegiate Guidelines Network [SIGN] 2010**). Furthermore, depression in people with diabetes is associated with higher blood glucose levels, poorer adherence to therapeutic regimens (whether pharmacological or therapeutic lifestyle changes), more medical complications, and higher hospitalisation rates. According to Mitchell et al (2013) major depression is associated with an increased number of known cardiac risk

factors in people with diabetes and a higher incidence of coronary heart disease; therefore, attention should be paid to screening and treatment of depression in people with diabetes.

In 2001, the **Diabetes, Attitudes, Wishes and Needs (DAWN)** study showed that more than two in five people with diabetes reported poor psychological wellbeing; many people experienced emotional stress related to their diabetes; and more than a third of health care providers did not feel equipped to adequately address patients' psychological needs.

There may be a range of psychological and social factors that can impact on the ability of people with diabetes to manage their condition, and it is unclear whether the burden of managing diabetes causes psychological and social problems or vice versa. Therefore, assessment and appropriate management of psychological issues are important throughout the lifespan of people with diabetes, and should be a routine component of the diabetes consultation (Chiang et al 2014).

The National Institute for Health and Care Excellence (NICE) guidelines (2004) conclude children and young people with type 1 diabetes have a greater risk of emotional and behavioural problems than other children and young people. In particular, they are at higher risk of anxiety and depression, eating disorders, cognitive disorders, behaviour and conduct disorders and non-adherence. They highlight the importance of timely and ongoing access to mental health professionals for assessment of psychological dysfunction and the delivery of psychosocial support. In a study exploring the stress of parents of children with type 1 diabetes, Whittmore et al (2012) found that parents experience considerable stress related to the trauma of diagnosis and the demands of treatment management. Although many parents find ways to effectively manage this stress, others experience clinically significant levels of psychological distress, including symptoms of depression, anxiety, and posttraumatic stress. These symptoms have been shown to have negative effects on parenting, the child's quality of life, and the child's metabolic control. Therefore, screening and preventive interventions for parents as well as the child with diabetes are needed.

It is important to consider cultural variances in response to being diagnosed and living with a long term condition such as diabetes. Following her study exploring physical and psychological wellbeing among adults with type 2 diabetes in New Zealand, with a particular aim to identify the experiences of Pacific peoples, Paddison (2010) concluded that adults with type 2 diabetes who are young, overweight, have concerns about prescribed medications, and those of Pacific ethnicity, were most likely to experience adverse health outcomes, including poor metabolic control and diabetes-related distress. She concluded that among Pacific peoples in particular, there is a need to address concerns about medication and emotional distress about diabetes, while maintaining a focus on improving metabolic control.

For people with diabetes, it is important to make a distinction between depression and distress. According to Fisher et al (2012), diabetes distress (DD) 'refers to the unique, often hidden emotional burdens and worries that are part of the spectrum of patient experience when managing a severe, demanding chronic disease like diabetes. High levels of DD are common (prevalence, 18–35%; 18-month incidence, 38–48%) and persistent over time, and they are distinct from clinical depression in their linkages with glycaemic control and disease management. High levels of DD have been significantly associated with poor glycaemic control, poor self-care, low diabetes self-efficacy, and poor quality-of-life, even after controlling for clinical depression' (p 246).

Therefore, **it is important to distinguish between depression and distress as different interventions will be required.** According to Gonzalez et al (2011), a comprehensive approach ‘that distinguishes clinical depression from disease related distress and that offers support for the management of emotional distress as an integral part of providing support for the behavioural management of diabetes will have the greatest likelihood of clinical benefit for the vast majority of patients with diabetes’ (p 238).



Guidelines

The **Scottish Intercollegiate Guidelines Network (SIGN)** Guideline for the Management of Diabetes (116) (2010) recommends the following:

Regular assessment of a broad range of psychological and behavioural problems in children and adults with type 1 diabetes:

- In children this should include eating disorders, behavioural, emotional and family functioning problems.
- In adults this should include anxiety, depression and eating disorders.
- Health professionals working in diabetes should have sufficient levels of consulting skills to be able to identify psychological problems and be able to decide whether or not referral to a specialist service is required.
- Validated screening tools widely used to assess psychological distress in the general population(eg, HADS) may be used in adults or young people with diabetes.
- Health care professionals should be aware of cultural differences in type and presentation of psychological problems within different ethnic communities living with diabetes and facilitate appropriate psychological/emotional support.
- Children and adults with type 1 and type 2 diabetes should be offered psychological interventions to improve glycaemic control in the short and long term.
- Health care professionals working with adults and children with diabetes should refer those with significant psychological problems to services or colleagues with expertise in this area www.sign.ac.uk/pdf/sign116.pdf.

National Institute for Health and Care Excellence (2004) guideline type 1 diabetes: diagnosis and management of type 1 diabetes in children, young people and adults, provides a number of recommendations for screening and attending to psychological issues (www.nice.org.uk/guidance/CG15/chapter/key-priorities-for-implementation-children-and-young-people).

The American Diabetes Association’s Standards of Medical Care in Diabetes (2014) states:

- it is reasonable to include assessment of the patient’s psychological and social situation as an ongoing part of the medical management of diabetes
- psychosocial screening and follow-up may include, but are not limited to, attitudes about the illness, expectations for medical management and outcomes, affect/mood, general and diabetes-related quality of life, resources (financial, social, and emotional), and psychiatric history
- routinely screen for psychosocial problems, such as depression and diabetes-related distress, anxiety, eating disorders, and cognitive impairment.



Implementation advice

In everyday practice

If problems are identified, there are options depending on the need:

- follow up with the nurse or medical practitioner
- referral via primary or secondary care mental health services or local psychology services
- an Employee Assistance Programme (EAP) if they are working and have this available to them
- online therapies eg, Beating the Blues, depression.org (see Resources section).

The **Scottish Intercollegiate Guidelines Network (SIGN)** Guidelines have provided the following checklist for the provision of information in daily clinical practice. This gives examples of the information patients/carers/family/whānau may find helpful at the key stages of the patient journey. The checklist was designed by members of the SIGN guideline development group based on their experience and their understanding of the evidence base. The checklist is neither exhaustive nor exclusive.

Health care professionals should:

- on those occasions where significant psychosocial problems are identified, explain the link between these and poorer diabetes control. If possible, it is good practice to also give suitable leaflets. They should advise patients where best to obtain further help, and facilitate this if appropriate
- be mindful of the burden caused by psychosocial problems (such as clinical and subclinical levels of depression) when setting goals and adjusting complex treatment regimens (typically adults and children will be less able to make substantial changes to their lives during difficult times).

People with diabetes (or parents/guardians) should:

- try to speak to their general practitioner or diabetes team if they feel they (or their children) have significant psychosocial issues
- be mindful that many psychosocial problems make diabetes self-care more difficult and also that many difficulties can be successfully treated with the right help.

American Diabetes Association (ADA) position statement type 1 diabetes (Chiang et al 2014) recommends: Special attention should be paid to diabetes-related distress, fear of hypoglycaemia (and hyperglycaemia), eating disorders, insulin omission, subclinical depression, and clinical depression. These factors are significantly associated with poor diabetes self-management, a lower quality of life, and higher rates of diabetes complications.

Screening – which tool to use?

Holt et al (2012) undertook a systematic review to determine if there was evidence for a particular screening tool for depression in people with diabetes. They concluded that although a range of depression screening tools have been used in research, there remains few data on their reliability and validity. Information on the cultural applicability of these instruments is even scantier. Further research is required in order to determine the suitability of screening tools for use in clinical practice and to address the increasing problem of co-morbid diabetes and

depression. The abstract for the article can be found at:
www.ncbi.nlm.nih.gov/pubmed/21824180.

The National Clearing House Institute for Clinical Improvement provides evidence to suggest the Patient Health Questionnaire 2, a shortened version of the PHQ 9, is an effective tool for screening for depression in adults in primary care. Either the Patient Health Questionnaire-2 (PHQ-2) or the PHQ-9 can be used to screen for depression. There is stronger evidence supporting the use of the PHQ-9 in patients with chronic disease. The PHQ two-question tool (PHQ-2) should be used in routine screening settings. If the patient answers 'yes' to either of the two questions, the full PHQ-9 depression instrument should be administered. Further information can be found at:
www.qualitymeasures.ahrq.gov/content.aspx?id=47457

The Hospital and Anxiety Scale (HADS) is a widely used tool. It is designed as a measure of depression and anxiety for hospital, out-patient, and community settings. As well as being useful as a screening device, HADS can be repeated at weekly intervals to chart progress and is relatively unaffected by physical illness
([www.scalesandmeasures.net/files/files/Hospital%20Anxiety%20and%20Depression%20Scale%20\(1983\).pdf](http://www.scalesandmeasures.net/files/files/Hospital%20Anxiety%20and%20Depression%20Scale%20(1983).pdf)).

The prime-MD two question screen with the addition of a help question has been shown to be effective by Arroll et al (2005) in general practice in New Zealand for screening for depression in the general population. Nineteen general practitioners in six clinics in New Zealand participated in the study which included 1025 consecutive patients receiving no psychotropic drugs. They concluded that adding a question inquiring if help is needed to the two screening questions for depression improves the specificity of a general practitioner diagnosis of depression (www.ncbi.nlm.nih.gov/pubmed/16166106).

The prime-MD plus the help question is now included in eCHAT for lifestyle and mental health screening in primary care. eCHAT is a research-validated screening tool for the systematic screening of risky behaviours and mood problems that negatively impact on patients' health and wellbeing (www.myhealthscreenrx.com/; www.annfamned.org/content/11/5/460.full.pdf).

Diabetes distress

The Diabetes Distress 2 is another useful screening tool to rapidly assess diabetes distress in practice. Fisher et al (2012) describes the DDS2 as a 2-item diabetes distress screening instrument asking respondents to rate on a 6-point scale the degree to which the following items caused distress: (1) feeling overwhelmed by the demands of living with diabetes, and (2) feeling that I am often failing with my diabetes regimen. The DDS17 can be administered to those who have positive findings on the DDS2 to define the content of distress and to direct intervention (www.annfamned.org/content/6/3/246.full.pdf+html).

Screening for depression in children and adolescents

According to Hamrin et al (2010), screening for depression and gender-specific presentation is an important component of health assessment. The US Preventative Services Task Force (2009) recommends that primary care providers screen adolescents for depression annually from 12 through 18 years of age during routine visits. If the clinician notes any symptoms of depression, parental concerns about their child's mood, or a family history of mood disorders, or concerns about substance use, younger children should be screened and evaluated. A variety of screening tools exist to screen for depression, including written assessments to be completed by the parent or teen and interview style assessments to be administered by the practitioner. Hamrin et al have identified a variety of age specific tools as presented below.

Name	Age range	Number of items	Source	Cost in US dollars	Test/re-test reliability
Beck Depression Inventory II (BDI)	13 to 18 years	21	www.psychcorp.com	\$75 for manual and 25 record forms	Good to high reliability – 0.93 to 0.96
Patient Health Questionnaire-Adolescent Version (PHQ-A)	13 to 18 years	83 (9 items to diagnosis depression)	http://ww3.depression-primarycare.org/	Free	Good reliability – 0.76
Children's Depression Inventory	7 to 17 years	27	http://psychcorp.com	\$100 for manual and 25 record forms	Good reliability – 0.66 to 0.82
Paediatric Symptom Checklist	3 to 16 years	35	http://psc.partners.org	Free	Good to high reliability – 0.80
Guidelines for Adolescent Preventative Services Questionnaire	11 to 21 years	72 Younger adolescent 61 – middle/older adolescent	www.uvpediatrics.com/health-topics/stage.php#GAPS	Free	Good reliability – 0.72

Sources: Beck et al 1996; Bethell et al 2001; Craighead et al 1998; Fann et al 2005; Finch et al 1987; Navon et al 2001; Sprinkle et al 2002.

Risk appraisal for psychosocial issues in adolescents

The **H**ome and environment, **E**ducation and employment, **E**ating, **A**ctivities/ambition, **D**rugs and alcohol, **S**exuality and relationships, **S**uicide and depression and **S**afety (HEEADSSS) tool is widely used in adolescent services (see Standard 16). Initially developed by Goldenring and Cohen in 1988, further iterations have been made. According to Goldenring and Rosen (2004), the HEEADSSS interview is a practical, time-tested, complementary strategy that health professionals can use to build on and incorporate the guidelines into their busy clinical consultations. One of the best qualities of the HEEADSSS approach is that it proceeds naturally from expected and less threatening questions to more personal and intrusive questions. This gives the interviewer a chance to establish trust and rapport with the teenager before asking the most difficult questions in the psychosocial interview (www2.aap.org/pubserv/psvpreview/pages/files/headss.pdf).

Bradford et al (2012) undertook a systematic review of psychosocial assessments for young people, in particular to examine the acceptability, disclosure and engagement, and predictive utility. They identified a number of potential tools; however, which tool is most appropriate for a clinician will depend on the domains they are most interested in, their preferred mode of delivery or available resources, available timeframe, and whether they work in a multidisciplinary environment. They concluded that the only tool, which is currently available in a self-administered format, covers all domains relevant to most young people, has been tested in multiple contexts, and can be completed in a short period, is the Adolescent Health Review (AHR). The full article can be accessed at: www.dovepress.com/psychosocial-assessments-for-young-people-a-systematic-review-examinin-peer-reviewed-article-AHMT-recommendation1.



Implementation examples / innovations



Massey University Health Conditions Psychology Service

Massey University Health Conditions Psychology Service for adults and young people with long-term health conditions and their families/whānau.

‘We offer short to medium term (usually 6–8 sessions) psychology services for adults and young people and families/whānau. We tend to focus on specific goals which we decide on in collaboration with you and we also refer to other services if needed. Our service is completely confidential. Our team is made up of experienced clinical psychologists. We assist people diagnosed with a long-term health condition and their families/whānau cope with, and adjust to, their illness. We see people who live in the MidCentral region, who are dealing with or adjusting to a long term medical condition. These include:

- diabetes
- asthma
- COPD
- cystic fibrosis
- heart conditions
- renal failure
- other illnesses affecting children and adolescents
- family/whānau members including husbands, wives, partners, parents, sisters and brothers.

There are a number of challenges you might face with a long-term health condition. For example you might feel distressed or overwhelmed, or you might be having some trouble adjusting to your condition. These issues can really affect people, making it hard to cope. Psychological skills are important resources which will help you (and your family/whānau) to:

- manage stress associated with the condition
- deal with physical symptoms like pain, panic attacks and sleep problems
- manage fears, anxiety or depression
- improve relationship skills and build up support networks
- work with your health professionals
- make decisions and solve problems around living with the condition
- provide balance in dealing with health difficulties and getting on with everyday life.’

For more information: www.massey.ac.nz/massey/learning/departments/school-of-psychology/psychology-services/manawatu/services/health-conditions-service.cfm.



Assessment tools

Structure

Evidence of local arrangements to ensure that people with diabetes are assessed for psychological problems, which are then managed appropriately.

Process

- (a) The proportion of people with diabetes assessed for psychological problems in the past 12 months.

Numerator	The number of people in the denominator receiving an assessment for psychological problems with at least a two item scale in the past 12 months
Denominator	The number of people with diabetes

- (b) The proportion of people with diabetes and psychological problems linked in to a local long term conditions programme.

Numerator	The number of people in the denominator who have been linked in to a long term condition programme
Denominator	The number of people with diabetes

Structure

Evidence of local arrangements for screening people with mental health conditions for diabetes.

Process

The proportion of people with mental health conditions on an antipsychotic medication who have been screened for diabetes in the past 12 months.

Numerator	The number of people in the denominator who have been screened for diabetes in the past 12 months
Denominator	The number of people with mental health conditions on an antipsychotic medication



Resources

- **Depression.org**

Depression is more than just a low mood – it can be a serious illness. But with the right help and support it is possible to get through it. This website has been created to help people understand more about depression so they can find a way through it. Everyone’s experience of depression is different so take some time to explore the site and find what is going to work for you.

<http://depression.org.nz/>.

- **Best Practice Advocacy Centre (BPAC)**

news page www.bpac.org.nz/BPJ/2013/June/news.aspx.

- **Beating the Blues:** online cognitive behavioural therapy for mild to moderate depression. Beating the Blues® is an evidence-based, online cognitive behavioural therapy (CBT) programme for the treatment of people with mild and moderate depression. The Ministry of Health has funded the Beating the Blues® E-therapy tool for the assessment and treatment of mild to moderate depression for use in primary care nationwide. Beating the Blues® is offered free of charge to general practices and some non-government organisations involved in primary care services. The benefits of the Beating the Blues® E-therapy tool include:
 - immediate access to CBT for patients with depression and/or anxiety
 - evidence-based therapy with no known adverse effects
 - clinical outcomes achieved similar to those of face-to-face therapy
 - requires minimal clinical input – supports clinical oversight
 - higher patient satisfaction with treatment than with usual care.

For assistance on how to register or for further information, please contact Andy Whittington of the E-Therapy Project Team: awhittington@medtechglobal.com or visit: www.beatingtheblues.co.nz/.

- **eCHAT** is a research-validated screening tool for the systematic screening of risky behaviours and mood problems that negatively impact on patients' health and wellbeing. The eCHAT is the electronic Case-finding and Help Assessment Tool. It can be accessed at: www.myhealthscreenrx.com/.
- **The Diabetes Attitudes, Wishes and Needs (DAWN) Study/Programme**
A variety of validated tools to support effective dialogue with people with diabetes and for assessing and addressing psychological needs are available from the DAWN study website: www.dawnstudy.org/ToolsAndResources/DialogueTools.asp.

DAWN for health professionals

- **DAWN experiment**
To practice patient-centred communications skills, you may want to try out 'The DAWN experiment'. Effective communication is also empathetic communication: it involves listening to patients in a way that ensures that they feel understood.
- The 5-item World Health Organization wellbeing index **WHO-5 questionnaire**
Depression is common among persons with diabetes, affecting 10–20% of the patient population. Unfortunately, the diagnosis of depression is often missed, but using a short questionnaire, such as the WHO-5, can help to monitor emotional wellbeing in patients as part of clinical routine.
www.dawnstudy.com/News_and_activities/Documents/WHO-5.pdf
- **Problem Areas In Diabetes (PAID) Diabetes distress questionnaire**
It is vital that clinicians are able to identify diabetes-related emotional distress in their patients. One tool that has proven very helpful to health care professionals is the Problem Areas in Diabetes (PAID) scale, a simple, one-page questionnaire.
www.dawnstudy.com/News_and_activities/Documents/PAID_problem_areas_in_diabetes_questionnaire.pdf
- **DAWN: Plans to change your life with diabetes**
'Your plans to change your way of living' provides a quick overview of each person's needs and readiness to change. The tool has been developed and tested as part of a decision-making method called Guided Self-Determination (GSD).
www.dawnstudy.com/News_and_activities/Documents/DAWN_Your%20plans%20to%20change%20your%20way%20of%20life_example.pdf

- **DAWN: Room for Diabetes in Your Life tool**

‘Room for diabetes in your life’ is a simple dialogue tool to help patients distinguish between negative and positive ways that diabetes can take up room in their life. The tool has been developed and tested as part of a decision-making method called Guided Self-Determination (GSD).

www.dawnstudy.com/News_and_activities/Documents/DAWN_Room_diabetes_in_your_life_example.pdf

DAWN tools to use with young people with diabetes

- **DAWN Youth Quality of Life tool**

The achievement of good metabolic control is difficult in children, and particularly in adolescents. Having diabetes requires a complex, intrusive and highly demanding daily programme for families/whānau, which may have a negative effect on Quality of Life (QOL).

www.dawnstudy.com/News_and_activities/Documents/Quality_of_Life_tool.pdf

- **DAWN Youth Circle tool**

The children’s circle tool is designed to stimulate dialogue between the diabetes support team, children and young people with diabetes and their families/whānau. It focuses on non-medical issues which impact upon quality of life and diabetes self-management.

www.dawnstudy.com/News_and_activities/Documents/Childrens%20circle%20tool.pdf

All available at: www.dawnstudy.org/ToolsAndResources/DialogueTools.asp.

DAWN for people with diabetes

- **A Good Life with Diabetes**

The evidence-based diabetes self-help coping programme, A good life with diabetes, is based on cognitive behavioural therapy. It is a multi-session coached programme to instil coping skills based on the CBT model and inspire a positive mentality about diabetes.

- **Nora’s Notes**

Nora’s Notes are written by a teenager with diabetes who understands daily life with the disease. The Notes are genuine, honest, and frank, and something any young person or those who care for someone with diabetes should understand. They can be accessed at:

www.dawnstudy.org/toolsandresources/norasnotes.asp.

- **The Insulin Interview**

The Insulin Interview offers help to better deal with concerns or fears about starting insulin. It is a tool to enable people with diabetes to make confident treatment choices with minimal anxiety. Six short questions invite people with diabetes to identify their level of agreement or disagreement with statements about different aspects of starting insulin. Based on the responses a personalised result will appear with a video providing facts to address and counter the concerns. These can be allayed by informed discussion with a health care professional. It can be accessed at: http://dawnstudy.com/barriers_to_insulin/take-charge/insulin-interview.aspx.



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Management of glycaemia and cardiovascular risk for people with diabetes



Standard 5

People with diabetes should agree with their health care professionals to start, review and stop medication as appropriate to manage their cardiovascular risk, blood glucose and other health issues. They should have access to glucose monitoring devices appropriate to their needs.

Key practice points

- Medication decisions should be made jointly between health care professionals and the individual following discussion about the condition, goals and the role of medication.
- Glucose monitoring devices should be appropriate for the individual and should be made available along with education on their use and interpretation of findings.

Read this standard in conjunction with the equity and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that people with diabetes are able to agree with their health care professional to start, review and stop medications to lower blood glucose, blood pressure and blood lipids in accordance with New Zealand guidelines. Also ensure that people with diabetes have access to appropriate blood glucose monitoring devices.

Health care professionals ensure the person with diabetes understands and agrees with them to start, review and stop medication to lower blood glucose, blood pressure and blood lipids in accordance with New Zealand guidelines. Also ensure that people with diabetes have access to appropriate blood glucose monitoring devices.

Planners and funders ensure they commission services that enable the person with diabetes to agree with their health care professional to start, review and stop blood glucose, blood pressure and blood lipid lowering medications in accordance with New Zealand guidelines. Also ensure that services facilitate access for people with diabetes to appropriate blood glucose monitoring devices.

People with diabetes agree with their health care professional to start, review and stop medications to lower blood glucose, blood pressure, and blood lipids and access appropriate blood glucose monitoring devices.

There are two components to this Standard:

- **medication management** – this component describes agreement between patient and professional regarding the need for and adherence to medication for diabetes and related conditions
- **blood glucose monitoring** – this component covers blood glucose monitoring.



Introduction

Medication management

The notion of agreement sounds simple but has a number of facets. These include: the acknowledgement and engagement of the patient as an active participant in treatment decision-making; individuals' views on taking medication and the factors that influence adherence; and their satisfaction with their treatment – all of which may impact on medication use. Agreeing to start, review and stop medication is related to patient education (see Standard 1) in that people need to understand their condition/s, the way in which medication helps, and the importance of taking it appropriately and regularly.

The Best Practice Advocacy Centre's (2012a) article about people with type 2 and poor glycaemic control notes that an individual's belief about the need for anti-diabetic medication can be influenced by factors such as fear, fatalism about the disease and family or whānau's negative experiences with treatment. It continues to say that 'a shared decision-making approach to management allows patients and health professionals to form an agreement on diabetes care that may also correct previous clinical assumptions, eg, concerning treatment adherence, health literacy or motivation. To do this well, primary care teams need to have a good understanding of the patient's background, beliefs and priorities' (p 41).

A 2008 policy brief to the World Health Organization (Coulter et al) discusses the importance of patient involvement in treatment decision-making. They state in the summary: 'One of the most common sources of patient dissatisfaction is not feeling properly informed about (and involved in) their treatment. Shared decision-making, where patients are involved as active partners with the clinician in treatment decisions, can be recommended as an effective way to tackle this problem. Clinicians and patients work together as active partners to clarify acceptable medical options and choose appropriate treatments. While not all patients want to play an active role in choosing a treatment – because of age-related and cultural differences – most want clinicians to inform them and take their preferences into account. Well-designed training courses can improve the communication skills of doctors, nurses and pharmacists. As patients become more involved, their knowledge improves, their anxiety lessens and they feel more satisfied. Patient coaching and question prompts help to empower patients to take a more active role in consultations. These prompts improve knowledge and recall and help patients feel more involved and in control of their care. Evidence-based patient decision aids facilitate the process of making informed decisions about disease management and treatment. Decision aids can improve a patient's knowledge and their level of involvement in treatment decisions. They also give patients a more accurate perception of risk and encourage appropriate use of elective procedures'.

Parchman et al (2010) studied participatory decision-making in primary care and found positive associations with medication adherence, which in turn was associated with improved HbA1c and cholesterol.

Another factor that may influence agreement between parties is the satisfaction people feel with the treatment they are receiving. Anderson et al (2009) developed the Diabetes Medication Satisfaction Tool as assessment of treatment satisfaction was seen to be important for the building of a therapeutic relationship between patient and provider and for tailoring of regimen. The 16-item tool 'performed well in assessing treatment experiences: ease and convenience, lifestyle burdens, wellbeing, and medical control' and can be found at: www.ncbi.nlm.nih.gov/pmc/articles/PMC2606829/pdf/51.pdf.

National Institute for Health and Care Excellence (NICE) (2009) defines adherence as ‘the extent to which the patient’s action matches the agreed recommendations’ which presumes that the prescriber and patient are in agreement on the prescriber’s suggestions. Poor medication adherence is common. According to the Agency for Healthcare Research and Quality’s (2012), evidence report on medication adherence, studies have consistently shown that between 20% and 30% of prescriptions are never filled and that around half of chronic condition medications are not taken as prescribed. However, non-adherence should not be considered solely a patient problem but as a breakdown in the delivery system either because the patient did not fully accept the prescription when it was provided or did not receive the support required to follow through. The NICE Guidelines (2009) state the following in their introduction: ‘Addressing non-adherence is not about getting patients to take more medicines per se. Rather, it starts with an exploration of patients’ perspectives of medicines and the reasons why they may not want or are unable to use them. Health care professionals have a duty to help patients make informed decisions about treatment and use appropriately prescribed medicines to best effect. There are many causes of non adherence but they fall into two overlapping categories: intentional and unintentional. Unintentional non adherence occurs when the patient wants to follow the agreed treatment but is prevented from doing so by barriers that are beyond their control. Examples include poor recall or difficulties in understanding the instructions, problems with using the treatment, inability to pay for the treatment, or simply forgetting to take it. Intentional non adherence occurs when the patient decides not to follow the treatment recommendations. This is best understood in terms of the beliefs and preferences that influence the person’s perceptions of the treatment and their motivation to start and continue with it. It follows that to understand adherence to treatment we need to consider the perceptual factors (for example, beliefs and preferences) that influence motivation to start and continue with treatment, as well as the practical factors that influence patients’ ability to adhere to the agreed treatment’.

The World Health Organization published a report on adherence (2003) which can be found at: www.who.int/chp/knowledge/publications/adherence_report/en/. A summary can be found at: www.who.int/chp/knowledge/publications/adherence_introduction.pdf.

Key messages are as follows:

- **Poor adherence to treatment of chronic diseases is a worldwide problem of striking magnitude** – Adherence to long term therapy for chronic illnesses in developed countries averages 50%. In developing countries, the rates are even lower. It is undeniable that many patients experience difficulty in following treatment recommendations.
- **The impact of poor adherence grows as the burden of chronic disease grows worldwide** – Non-communicable diseases and mental disorders, human immunodeficiency virus/acquired immunodeficiency syndrome and tuberculosis, together represented 54% of the burden of all diseases worldwide in 2001 and will exceed 65% worldwide in 2020. The poor are disproportionately affected.
- **The consequences of poor adherence to long term therapies are poor health outcomes and increased health care costs** – Poor adherence to long term therapies severely compromises the effectiveness of treatment making this a critical issue in population health both from the perspective of quality of life and of health economics. Interventions aimed at improving adherence would provide a significant positive return on investment through primary prevention (of risk factors) and secondary prevention of adverse health outcomes.

- **Improving adherence also enhances patients' safety** – Because most of the care needed for chronic conditions is based on patient self-management (usually requiring complex multitherapies), use of medical technology for monitoring, and changes in the patient's lifestyle, patients face several potentially life-threatening risks if not appropriately supported by the health system.
- **Adherence is an important modifier of health system effectiveness** – Health outcomes cannot be accurately assessed if they are measured predominantly by resource utilization indicators and efficacy of interventions. The population health outcomes predicted by treatment efficacy data cannot be achieved unless adherence rates are used to inform planning and project evaluation.
- **Increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments** – Studies consistently find significant cost-savings and increases in the effectiveness of health interventions that are attributable to low-cost interventions for improving adherence. Without a system that addresses the determinants of adherence, advances in biomedical technology will fail to realise their potential to reduce the burden of chronic illness. Access to medications is necessary but insufficient in itself for the successful treatment of disease.
- **Health systems must evolve to meet new challenges** – In developed countries, the epidemiological shift in disease burden from acute to chronic diseases over the past 50 years has rendered acute care models of health service delivery inadequate to address the health needs of the population. In developing countries, this shift is occurring at a much faster rate.
- **Patients need to be supported, not blamed** – Despite evidence to the contrary, there continues to be a tendency to focus on patient-related factors as the causes of problems with adherence, to the relative neglect of provider and health system-related determinants. These latter factors, which make up the health care environment in which patients receive care, have a major effect on adherence.
- **Adherence is simultaneously influenced by several factors** – The ability of patients to follow treatment plans in an optimal manner is frequently compromised by more than one barrier, usually related to different aspects of the problem. These include: the social and economic factors, the health care team/system, the characteristics of the disease, disease therapies and patient-related factors. Solving the problems related to each of these factors is necessary if patients' adherence to therapies is to be improved.
- **Patient-tailored interventions are required** – There is no single intervention strategy, or package of strategies that has been shown to be effective across all patients, conditions and settings. Consequently, interventions that target adherence must be tailored to the particular illness-related demands experienced by the patient. To accomplish this, health systems and providers need to develop means of accurately assessing not only adherence, but also those factors that influence it.
- **Adherence is a dynamic process that needs to be followed up** – Improving adherence requires a continuous and dynamic process. Recent research in the behavioural sciences has revealed that the patient population can be segmented according to level-of-readiness to follow health recommendations. The lack of a match between patient readiness and the practitioner's attempts at intervention means that treatments are frequently prescribed to patients who are not ready to follow them. Health care providers should be able to assess their patient's readiness to adhere, provide advice on how to do it, and follow up the patient's progress at every contact.

- **Health professionals need to be trained in adherence** – Health providers can have a significant impact by assessing risk of non-adherence and delivering interventions to optimise adherence. To make this practice a reality, practitioners must have access to specific training in adherence management, and the systems in which they work must design and support delivery systems that respect this objective. For empowering health professionals an ‘adherence counselling toolkit’ adaptable to different socioeconomic settings is urgently needed. Such training needs to simultaneously address three topics: knowledge (information on adherence), thinking (the clinical decision-making process) and action (behavioural tools for health professionals).
- **Family, community and patients’ organisations: a key factor for success in improving adherence** – For the effective provision of care for chronic conditions, it is necessary that the patient, the family and the community who support him or her all play an active role. Social support, (ie, informal or formal support received by patients from other members of their community), has been consistently reported as an important factor affecting health outcomes and behaviours. There is substantial evidence that peer support among patients can improve adherence to therapy while reducing the amount of time devoted by the health professionals to the care of chronic conditions.
- **A multidisciplinary approach towards adherence is needed** – A stronger commitment to a multidisciplinary approach is needed to make progress in this area. This will require coordinated action from health professionals, researchers, health planners and policy-makers.

Blood glucose monitoring

Orr-Walker (2011) suggests that blood glucose monitoring (BGM) is different from monitoring of blood pressure or lipids as it is more dynamic and an understanding of its variation can assist with achieving good glycaemic control. It is particularly useful for identifying hyper- and hypoglycaemic episodes and can help determine causes and inform management. While self-monitoring blood glucose (SMBG) is essential for people with type 1 diabetes, for type 2 it depends on treatment and the purpose of measurement.

The New Zealand Primary Care Handbook 2012 provides the following information on the benefits of self-monitoring. Benefits of self-monitoring blood glucose (SMBG) by people with type 2 include:

- assisting patients and health practitioners in adjustment of insulin or other medication
- encouraging self-empowerment
- promoting better self-management behaviours

However, self-monitoring may fail to improve diabetes control and negative psychological outcomes have been reported in some studies. See Table 30 of the NZ Primary Care Handbook for guidance on when SMBG is recommended.

Similarly, a **Best Practice Advocacy Centre (BPAC)** (2007) article provides guidance on who should be self-monitoring their blood glucose and notes that ‘any component of a treatment plan that is both invasive and expensive needs to result in an improved clinical outcome. Gathering information about blood glucose levels is only useful when it can be used to improve clinical outcomes’(p 14). The article suggests that when done effectively SMBG can increase awareness and adherence, can empower and reassure. However, a continual reminder of less than optimum control can lead to uncertainty, frustration, guilt and anxiety. If the results are not being appropriately used by doctors, nurses (and patients themselves) this can lead to discouragement and a lack of motivation.



Guidelines

Medication management

NICE Guidelines on medication adherence can be accessed at: www.nice.org.uk/guidance/CG76.

Blood glucose monitoring

The New Zealand Primary Care Handbook 2012 states that self-monitoring is recommended for insulin and for sulphonylureas, where motivated patients may benefit from routine self-monitoring of blood glucose (SMBG) to reduce risk of hypoglycaemia. While it is not generally recommended for Metformin and other oral hypoglycaemic agents, there are special occasions when SMBG might be considered for those:

- at increased risk of hypoglycaemia
- experiencing acute illness
- undergoing significant changes in pharmacotherapy or fasting (eg, during Ramadan)
- with unstable or poor glycaemic control (HbA_{1c} >64 mmol/mol)
- who are pregnant or planning pregnancy.

The **International Diabetes Federation** (IDF 2009) guidelines on self-monitoring of blood glucose by people not using insulin are summarised as follows:

1. SMBG should be used only when people with diabetes (and/or their caregivers) and/or their health care providers have the knowledge, skills and willingness to incorporate SMBG and therapy adjustment into the care plan in order to attain agreed treatment goals.
2. SMBG should be considered at the time of diagnosis to enhance the understanding of diabetes as part of patient education and to facilitate timely treatment initiation and titration optimisation.
3. SMBG should also be considered as part of ongoing diabetes self-management education to assist better understanding of the disease and provide a means to actively and effectively participate in its control and treatment, modifying behavioural and pharmacologic interventions as needed, in consultation with the health care provider.
4. SMBG protocols (intensity, frequency) should be individualised to address each person's specific educational, behavioural, clinical and provider requirements for data on glycaemic patterns and to monitor the impact of therapeutic decision-making.
5. The purpose(s) of SMBG and using SMBG data should be agreed on by the person and the health care provider and documented, as should the actual reviews of data.
6. SMBG use requires an easy procedure for patients to monitor meter performance and accuracy.

Devices




Three devices for blood glucose monitoring are currently subsidised by PHARMAC. Information about funded and unfunded devices can be found at: www.pharmac.health.nz/assets/diabetes-blood-glucose-meters-comparison-2012.pdf.

All of the subsidised devices are produced by CareSens (CareSens II, CareSens N and CareSens N POP) and product information, videos demonstrating their use and owners' manuals (with quick guides translated into 11 languages including Māori, Samoan, Cook Island Māori, Tongan and Tokelauan) can be accessed at: www.caresens.co.nz/.

Access to glucose monitoring devices is clearly related to funding and by subsidising a limited range of meters from a single source PHARMAC has limited the available options. However, they feel that the range offered is sufficient to meet the needs of New Zealanders with diabetes. The decision about which device to use should be made collaboratively between the individual and their diabetes specialist nurse/doctor. The relative merits of each device should be considered as well as the status, needs and lifestyle of the individual.

BPAC (2013) advises that 'there is an online training module (toolkit) available for practice nurses and other health professionals, to provide education on the CareSens blood glucose meters and testing strips. This module provides 0.5 hours towards continuing professional development (CPD) requirements' (p 2). The toolkit is available from www.goodfellowlearning.org.nz/.

BPAC (2012b) provides the following summary of the meters.

<p>CareSens II</p> <p>The CareSens II has a large screen and large numerals useful for vision impaired people with diabetes. It stores 250 records on the meter or records can be downloaded to the PC Care software.</p>	
<p>CareSens N</p> <p>The CareSens N is a simple, no-coding meter, which calculates and displays the 14-day average of total test results, as well as pre- and post-meal test results. This meter is ideal if people need to test frequently or require alarms to remind them to test at meal times. The meter stores 250 records which can be downloaded to the PC Care software.</p>	
<p>CareSens N POP</p> <p>The N POP meter includes more advanced functions such as LCD backlighting, plus strip expiry indicator alarm and no manual coding. The meter stores 500 records which can be downloaded to the PC Care software.</p>	



Implementation advice

Medication management

Coulter et al (2008) conclude that encouraging patients to play an active role in their health care should address health literacy, shared decision-making and self-management. Interventions to promote these include:

- written information that supplements clinical consultations
- web sites and other electronic information sources
- personalised computer-based information and virtual support
- training for health professionals in communication skills
- coaching and question prompts for patients
- decision aids for patients
- self-management education programmes.

NICE (2009) suggestions for encouraging medication adherence require:

- a frank and open approach which recognises that non adherence may be the norm (or is at least very common) and takes a no blame approach, encouraging patients to discuss non adherence and any doubts or concerns they have about treatment
- a patient centred approach that encourages informed adherence
- identification of specific perceptual and practical barriers to adherence for each individual, both at the time of prescribing and during regular review, because perceptions, practical problems and adherence may change over time.

The **World Health Organization** (WHO 2003) concludes that the most effective interventions for enhancing adherence aim to improve self-management capabilities. Self-management programmes (see Standard 1) can improve health status and reduce health care utilisation and costs, and are critical for those with long term conditions as they must rely on effort and self-regulation to maintain behaviour. The strategies suggested to be effective include:

- self-monitoring
- goal-setting
- stimulus control
- behavioural rehearsal
- corrective feedback
- behavioural contracting
- commitment enhancement
- creating social support
- reinforcement
- relapse prevention.

Such strategies are most effective when delivered as part of multimodal programmes and tailored to the individual to include the creation of social support, reorganisation of the service delivery environment, increased accessibility of services and delivered within a collaborative treatment relationship.

Blood glucose monitoring

Information on maintaining self-monitoring of blood glucose is also provided with the suggestion that the ‘frequency of blood glucose testing can be reduced once the patient is established on insulin and blood glucose levels are stable, but should still be such as to show the blood glucose profile over the course of the day’.

In addition:

- if the patient chooses to test less frequently, ask them to vary testing across different times of the day
- patients may choose to test in other patterns, (eg, four times a day on one or two days of the week)
- maintenance SMBG can be combined with checking HbA1c levels (3–6 monthly) to assess glycaemic control and the need for medication changes.

Adherence is also an issue for self-monitoring of blood glucose levels. The WHO adherence report (2003) refers to research showing that recommended monitoring of glucose levels was occurring for only 26% of children and adolescents with type 1 and 40% of adults with type 1 diabetes. Finnish and US studies found that 6–7% of adults never tested their glucose levels. Another study of adolescents found that up to 80% made significant mistakes in estimating glucose concentrations in urine, with purposeful under and over reporting also being identified.

In studies of people in the US with type 2 diabetes, it was found that 67% of participants were not following recommendations for testing, and in an Indian study only 23% were performing blood glucose monitoring at home.



Assessment tools

Medication management

Coulter et al (2008) provide suggestions for how efforts to increase patient engagement could be assessed at a national, regional and practice level.

- **At a national level:**
 - explicit standards or targets can require care providers to demonstrate their competence in patient education and to provide evidence of patient involvement in decision-making
 - these standards might also require evidence of support for self-management and of provision of health information and decision aids in a variety of formats
 - incentive-based or competitive systems, including choice mechanisms or specific contractual requirements, can be used to motivate change among care providers
 - also, coordinated patient survey programmes have been shown to be a useful way of monitoring performance across the system, by requiring care providers to undertake systematic surveys of patients’ experiences and to publish the results.

- **At a regional level:** Good practice standards developed by professional bodies can require clinicians to:
 - involve patients in treatment and management decisions
 - provide them with education and support for self-management
 - adopt strategies guided by evidence, to build health literacy
 - standards could also require clinicians to help patients navigate the system and to guide them to appropriate sources of health information and decision aids
 - patient feedback obtained by means of standardised questionnaires can be used to monitor the performance of clinicians and reward good practice
 - national bodies responsible for professional education, including the development of educational methods, curricula and assessment, should ensure that care providers comply with patient-centred standards.

- **At a practice level:** The following knowledge and skills are required:
 - an understanding of the patient’s perspective
 - the ability to guide patients to sources of information on health and health care
 - the ability to educate patients about protecting their health and preventing the occurrence or recurrence of disease
 - the ability to elicit and take into account a patient’s preferences
 - the ability to communicate information on risk and probability
 - the ability to share treatment decisions
 - the ability to provide support for self-care and self-management
 - the ability to work in multidisciplinary teams
 - the ability to use new technology to assist patients in becoming more engaged in their health
 - the ability to manage time effectively to make all this possible.

Process

NICE (2011) provides the following quality process measures:
www.nice.org.uk/guidance/QS6/chapter/Quality-statement-5-Medication.

- (a) The proportion of people with diabetes who have received a medication review in the past 12 months.

Numerator	The number of people in the denominator receiving a review of medication in the past 12 months
Denominator	The number of people with diabetes

- (b) The proportion of people with diabetes whose blood glucose, blood pressure and blood lipids are managed in accordance with New Zealand guidelines.

Numerator	The number of people in the denominator whose blood glucose, blood pressure and blood lipids are managed in accordance with New Zealand guidelines
Denominator	The number of people with diabetes

- (c) The proportion of people with diabetes whose medications are not managed according to New Zealand guidelines who have medical notes documenting clinical reasons for exception.

Numerator	The number of people in the denominator who have medical notes documenting clinical reasons for exception
Denominator	The number of people with diabetes whose medications are not managed according to New Zealand guidelines

Blood glucose monitoring

- **NICE guidelines on type 2 diabetes**

www.nice.org.uk/guidance/cg87/chapter/guidance#glucose-control-levels suggest that, with respect to glucose monitoring in people with type 2 (criterion 5), unless a patient has been enrolled in a service for less than a year, the following should be assessed at least annually:

- self-monitoring skills
 - the quality and appropriate frequency of testing
 - the use made of the results obtained
 - the impact on quality of life
 - the continued benefit
 - the equipment used.
- The MIMS (NZ) Ltd **Everybody** health information website provides the following advice for home glucose monitoring which could be used to assess patient knowledge and technique:
 - Record your results in a diabetes diary (your meter may also store your results for reference). This will make it easier for you to see trends over time. You can also use your diary as a motivational tool. Putting a tick in your diary for the days you achieve your exercise or food goals can be very encouraging over time.
 - Prick your fingers on the side of your finger (towards the tip) rather than on the pad (or tip) of your finger. This will be more comfortable for you, especially if you use a keyboard.
 - If you drop your hand down close to the floor after pricking it then wait for a few moments, the blood will rush into your hand. When you then squeeze out the blood you will get a much larger sample. You may find that by doing this you may also be able to reduce the depth gauge on your finger-pricker, which will mean your finger prick will be less deep. This will make your testing more comfortable.
 - Make sure your hands are clean before testing. If you have been handling something sweet before testing, the residue of it on your fingers may get into your test and make it falsely high.
 - You will get a much better sized drop of blood if your hands are warm before testing.



Resources

Medication management

- **Decision aids** have been developed to assist patient and clinician with making a joint decision about treatment options. An example produced by the Mayo Clinic can be found here: <http://shareddecisions.mayoclinic.org/decision-aids-for-chronic-disease/diabetes-medication-management/>
- Another, addressing the decision about **insulin delivery and blood glucose monitoring** produced by AHRQ can be found here: www.effectivehealthcare.ahrq.gov/ehc/products/242/1240/glu_mon_cons_fin_to_post.pdf.

Blood glucose monitoring

- Information on self-monitoring of blood glucose, based on information provided by Diabetes New Zealand, is provided on the **Everybody health information website** here: www.everybody.co.nz/page-6427f495-fccd-439e-bdfd-21efbee65566.aspx.
- Information designed for consumers regarding CareSens meters is provided by **PHARMAC** here: www.pharmac.health.nz/assets/diabetes-new-blood-glucose-meters.pdf.
- **Diabetes New Zealand** information on self-monitoring, meters and tests strips and their use is provided here: [www.diabeteshb.org.nz/sites/default/files/Final%20Information%20for%20SMBG%20Version%208%20\(3\).pdf](http://www.diabeteshb.org.nz/sites/default/files/Final%20Information%20for%20SMBG%20Version%208%20(3).pdf).



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Standard 6

People with diabetes should be offered blood pressure, blood lipid and anti-platelet therapy to lower cardiovascular risk when required in accordance with current recommendations.

Key practice points

- In addition to glycaemic control, people with diabetes should be offered medication to address their other cardiovascular risk factors.
- Cardiovascular risk assessment should be calculated annually from time of diagnosis for adults with type 1 or type 2 diabetes.
- People with diabetes with a cardiovascular risk >20% should be on a statin.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that in addition to glycaemic management, people with diabetes are offered blood pressure, blood lipid and anti-platelet therapy as required to lower cardiovascular risk in accordance with New Zealand guidelines.

Health care professionals ensure that in addition to glycaemic management, the person with diabetes is offered blood pressure, blood lipid and anti-platelet therapy as required to lower cardiovascular risk in accordance with New Zealand guidelines.

Planners and funders commission services that, in addition to glycaemic management, ensure the person with diabetes is offered blood pressure, blood lipid and anti-platelet therapy as required to lower cardiovascular risk in accordance with New Zealand guidelines.

People with diabetes in addition to glycaemic management, are offered blood pressure, blood lipid and anti-platelet therapy as required to lower cardiovascular risk in accordance with New Zealand guidelines.



Introduction

Most patients with diabetes are at high risk for developing cardiovascular disease (Buse et al 2007), which is responsible for close to 50% of diabetes-related deaths (Robinson et al 2012). This risk is greater for Māori and people of Pacific and Southeast Asian origin. While the current New Zealand guidelines for cardiovascular risk assessment are based on those developed from the Framingham Heart Study in the United States, Robinson et al (2012) note that the application of the Framingham predictive risk equation to the New Zealand context has several disadvantages: the Framingham cohort did not include the ethnic groups relevant to New Zealand and included few people with diabetes; and the equation excludes a number of diabetes-specific variables known to predict cardiovascular disease, namely duration of diabetes, glycaemic control and albuminuria. In response to these concerns, a New Zealand adaptation has been developed which accommodates these requirements and has been tested

(Elley et al 2010) and validated (Robinson et al 2012) using a diabetes-specific sample in the Diabetes Cohort Study (DCS). The results of these studies suggest that application of the DCS model would require more people with diabetes to be treated with medication than the Framingham model would suggest, but that more cardiovascular events would potentially be avoided. The cardiovascular disease (CVD) risk calculator for people with diabetes can be found on the NZSSD website (www.nzssd.org.nz/cvd/) and requires the following information:

- age
- duration of diabetes
- sex
- smoking status
- systolic blood pressure
- ethnicity
- total cholesterol
- HDL
- albuminuria
- BP medication status.

The output provides a combined cardiovascular risk assessment incorporating known risk factors including diabetes. 'By knowing the combined risk, the clinician and patient can make decisions on more effective prevention and treatment of cardiovascular disease (CVD). These decisions include making choices about appropriate lifestyle change (principally diet, exercise and smoking), lipid-lowering and blood pressure (BP) lowering medication, antiplatelet medication, diabetes care, and medication after myocardial infarction (MI), stroke and other cardiovascular events' (NZ Primary Care Handbook Cardiovascular Update 2013, p 3).



Guidelines

The 2013 update to the 2012 **New Zealand Primary Care Handbook** guidelines on cardiovascular and diabetes risk assessment can be found here: www.health.govt.nz/system/files/documents/publications/cardiovascular-disease-risk-assessment-updated-2013-dec13.pdf.

Specific advice for people with diabetes is outlined in the **New Zealand Primary Care Handbook** (NZGG, 2012) here: www.health.govt.nz/system/files/documents/publications/nz-primary-care-handbook-2012.pdf.

The Cardiovascular and Diabetes Risk Assessment guidelines (2013) can be found here: www.health.govt.nz/system/files/documents/publications/cardiodiabetesriskassessment6dec13.pdf and state the following:

'Relative risk reductions are more or less constant across the spectrum of combined risk. The higher the combined risk, the larger the absolute benefit of treating one or more risk factors. The majority of patients with:

- an estimated five-year combined CVD risk below 10 percent can generally be well-managed without drug treatment
- an estimated five-year combined CVD risk between 10 percent and 20 percent will benefit from shared decision-making about the benefits and harms of blood pressure (BP) and lipid lowering drugs

- a combined CVD risk over 20 percent, including patients with a personal history of CVD, are likely to benefit significantly from blood pressure lowering, lipid-lowering and antiplatelet medication, over and above intensive non-pharmacological interventions.’



Implementation advice

The Cardiovascular Assessment risk calculator for people with diabetes can be found on the NZSSD website here: www.nzssd.org.nz/cvd/

Based on the current New Zealand guidelines, the following actions need to be performed to meet the Standard requirements:

- cardiovascular risk assessment has been done for all men aged 45 and over
- for men with known risk factors risk assessment has been done at age 35
- cardiovascular risk assessment has been done for all women aged 55 and over
- for women with known risk factors, risk assessment has been done at age 45
- cardiovascular risk assessment has been done for Māori men at 35 years and women at 45 years
- fasting lipids, HbA1c and two-seated blood pressure measurements are included in the comprehensive risk assessment
- those with an HbA1c of 41 to 49 mmol/mol have been advised about reducing their risk of diabetes.

Following cardiovascular risk assessment:

- those with a five-year risk <10% have been advised to be smoke-free, eat a healthy heart diet and be physically active
- risk assessment for this group has been recalculated every 5 to 10 years
- those with a five-year risk of 10% to 20% have received individualised support to stop smoking, eat a cardio-protective diet and be physically active using motivational interviewing and involving relevant support programmes, eg, smoking cessation
- advantages and disadvantages of BP lowering and lipid medication have been discussed and a shared decision about starting medication has been made
- risk assessment for this group has been recalculated as clinically indicated. For those not on BP and lipid medication CVD risk has been assessed annually (risk 15–20%) or two-yearly (risk 10–15%)
- those with a five-year risk >20% have received intensive lifestyle intervention and drug treatment (BP lowering, statins and antiplatelet therapy)
- risk assessment for this group has been recalculated annually or as clinically indicated
- those with established cardiovascular disease have received intensive lifestyle intervention and drug treatment (BP lowering, statins and antiplatelet therapy)
- risk assessment for this group has been recalculated initially at three months and then as clinically indicated.

NB: Clinical judgment and informed patient preferences (shared decision-making) should feature in decisions about treatment for all people, and particularly for those in the ‘intermediate’ range of risk and for younger or older people. Shared treatment decisions should take into account an individual’s estimated five-year combined CVD risk and the magnitude of absolute benefits and the harms of interventions. Individuals will vary in the way they interpret these risk estimates and in their desire and willingness to act on them.



Implementation examples / innovations



Nursing Initiative in Primary Care

A nursing innovation was funded by the Ministry of Health 2005 to 2007 to implement models of nursing service delivery with care pathways for risk reduction of cardiovascular disease and diabetes. It was based on national guidelines and incorporated quality assurance, audit and nurse leadership. Findings suggested the need for strong leadership, commitment, and collaboration through teamwork and the authors clarify the competencies required by primary health care nurses working in CVD risk assessment and management (<https://www.rnzcgp.org.nz/assets/documents/Publications/Archive-NZFP/June-2008-NZFP-Vol-35-No-3/HorsburghNURSINGJune08.pdf>).



Ngāti and Healthy

In 2004, a community-based diabetes prevention programme was established in Te Tairāwhiti, a rural Māori community where around half of the Ngāti Porou community have a glucose metabolism disorder. The aim of the programme is ‘to reduce the prevalence of insulin resistance in the short term and therefore reduce type II diabetes and associated complications in the long term’ (Best Practice Advocacy Centre 2008).

The programme, called Ngāti and Healthy, has been evaluated by Tipene-Leach and colleagues (2013). Programme development followed discussion about diabetes concerns between the community and a local Māori nurse, in consultation with a locally-raised academic. The planned intervention consisted of: community-wide health promotion initiatives conveying healthy lifestyle messages; community education and monitoring for identified high-risk individuals and their extended families/whānau; and a structural strategy aimed at adapting local environments to support lifestyle changes.

The evaluators concluded that: ‘community-wide lifestyle interventions have the potential to reduce rates of type 2 diabetes and other chronic diseases in high-risk communities, but require a high level of commitment from the health sector and buy-in from the community. Adequate commitment, leadership, planning and resources are essential’.



One Heart Many Lives

The PHARMAC One Heart Many Lives (OHML) initiative (www.oneheartmanyvives.co.nz/) started as a social marketing programme aimed at those at high risk of cardiovascular disease, such as Māori and Pacific men over 35 years. The key messages are:

- get your heart checked
- get more active
- eat better
- stop smoking.

It includes information about what is described as a ‘six pack’ consisting of blood pressure, nutrition, diabetes, cholesterol, being active and smoking.

In 2009, OHML was introduced in Hawkes Bay as a general practice initiative (Best Practice Advocacy Centre 2009) involving:

- clinical facilitator visits to all primary health organisations (PHOs) and practices
- providing the ability to do point-of-care testing
- developing practice and patient information including a handbook and patient information cards.

The One Heart Many Lives handbook presented ideas on how practices could:

- encourage Māori and Pacific men to attend general practice
- assess their risk when they do present
- identify manageable interventions
- encourage them to return
- gradually increase the amount of care they receive.

What happened in practice:

- Obtained funding for free CVD/health checks. The PHO assisted in making the One Heart Many Lives project reach its full potential by using Services to Increase Access funding to make the CVD/Health assessment free to the patient. The PHO also funded follow-up consultations.
- Developed practice specific interventions to encourage the target population to attend a free CVD/health check. One practice phoned patients in the target group to offer free assessment. Another practice sent out invitations to those in the target group. Both reported an overwhelming response and had very few patients decline the free check.
- CVD assessments were conducted by practice nurses using point-of-care testing, to obtain non-fasting total cholesterol, HDL and glucose. These results were used to calculate an initial estimate of CVD risk. Patients preferred to have the result at the time of consultation and outcomes could be discussed immediately or referred to the GP.

Outcomes were:

- increased number of cardiovascular risk assessments
- increased patient involvement and satisfaction with health care
- increased health professional satisfaction (Best Practice Advocacy Centre 2009).

Additional information is available on the HIIRC website: www.hiirc.org.nz/page/17701/one-heart-many-lives/?contentType=111&tab=4189§ion=10536.



Assessment tools

The Ministry of Health target ‘more heart and diabetes checks’ requires quarterly reporting of assessments and DHBs are ranked on their performance. Ranking from 1 to 20 is based on the percentage of completed cardiovascular risk assessments for all eligible persons within the last five years with a goal of 90 percent. Quality measures based on the New Zealand guidelines are as follows.

Process

The proportion of people with diabetes who have received a cardiovascular risk assessment in line with recommendations.

Numerator	The number of people in the denominator receiving a cardiovascular risk assessment in line with recommendations
Denominator	The number of people with diabetes

The proportion of people with diabetes with a combined risk >20% who are on a statin.

Numerator	The number of people in the denominator who are on a statin
Denominator	The number of people with diabetes with a combined risk factor >20%



Resources

- A **National Institute for Health and Care Excellence (NICE)** audit tool including cardiovascular risk assessment and treatment: www.nice.org.uk/Guidance/CG181.
- Patient information regarding diabetes and cardiovascular risk based on information provided by **Diabetes New Zealand** and the **Heart Foundation** can be found at the Everybody health information site: www.everybody.co.nz/page-3b4d08e0-ea93-4e79-babf-13d4cc72de41.aspx.
- The **Ministry of Health** in conjunction with the Heart Foundation provide an online course Improve Heart Health to support health professionals successfully design and deliver CVD risk assessment and management services: <http://learnonline.health.nz/course/category.php?id=63>.
- The **New Zealand Heart Foundation** provides an online risk assessment to determine the age of your heart and your risk of heart attack/stroke based on age, sex, ethnicity, smoking status, presence/absence of diabetes and cholesterol ratio. The ‘know your numbers’ tool can be found at: www.knowyournumbers.co.nz/.



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Standard 7

When insulin is required it should be initiated by trained health care professionals within a structured programme that, whenever possible, includes education in dose titration for the person with diabetes.

Key practice points

- Insulin is a lifelong requirement for people with type 1 diabetes.
- Starting insulin requires specialist knowledge and expertise, and insulin should only be initiated by suitably qualified practitioners.
- It takes time to assimilate the knowledge and skills required to manage insulin starts and sufficient numbers need to be performed on a regular basis in order to maintain competency.
- A structured programme for insulin initiation should include patient education about blood glucose monitoring and how to understand and use the results to support dose titration.
- Specialist management is needed to balance glycaemic control, hypoglycaemia and weight gain, taking into account individual circumstances.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure adequate staff training in initiating and managing insulin therapy within a structured programme, and providing self-management education to people on insulin, including dose titration.

Health care professionals ensure they are competent in insulin initiation and ongoing insulin management within a structured programme by accessing training and are able to support people with diabetes in managing their treatment, including insulin titration.

Planners and funders ensure they commission services that provide training and assess ongoing competency of health care professionals for initiating and managing insulin therapy within a structured programme that includes education in insulin titration for people with diabetes.

People with diabetes who need insulin receive help and support from trained health care professionals, including help with starting on insulin and managing their treatment. This should include advice on adjusting the dose of insulin according to their blood glucose levels.



Introduction

Because the pancreas produces very little or no insulin in people with type 1 diabetes, insulin for these people is a lifelong requirement.

According to the **Best Practice Advocacy Centre (BPAC)** New Zealand, 'Insulin should be considered in all people with type 2 diabetes who have unsatisfactory glycaemic control, despite lifestyle support and maximal oral hypoglycaemic agents. For a patient with significant hyperglycaemia who is already on maximal oral agents, the move to insulin should be immediate. The presence of diabetic complications and personal patient preference may also influence the decision to initiate insulin' (p 2). It has been suggested that insulin is not being initiated in line with treatment guidelines. The INSTIGATE study of people with type 2 being started in insulin in five European countries concluded that insulin was initiated only after HbA1c levels had been considerably higher than recommended guidelines for a considerable time (Jones et al 2009). BPAC (2012) notes that the HbA1c level at which insulin should be initiated differs by individual but that insulin should be viewed as just another step in the treatment ladder. Action in terms of starting and titrating insulin should be taken if the HbA1c level is unacceptable for a particular individual.

Health care professionals

Initiating insulin is an increasing requirement of both secondary and primary care services but requires considerable knowledge, expertise and experience to manage safely. Research has demonstrated that many practitioners are wary of starting people on insulin and continue to apply other approaches and delay initiation. Diabetes nurse specialists are the key personnel in managing insulin starts and also providing education and supervision of other staff until they develop skills and proficiency to do insulin starts alone. An evaluation of the Wandsworth Insulin Start Programme (WISP), a course designed to educate and support GPs and practice nurses to initiate insulin in people with type 2 diabetes, was performed by Chadder (2013). The course provided 2.5 days of intensive training followed by supervision of between 3 and 10 starts over the following year. A GP and practice nurse from the same practice were encouraged to attend in order to develop a team approach to insulin starts in primary care. While feedback on the course was positive, its effectiveness over time could not be asserted due to variable numbers of starts being done and attendees not performing enough starts to develop the necessary skills and expertise. Chadder states that 'Practice nurses and GPs need to be carrying out insulin initiation on a regular basis in order to maintain skills and confidence and have the time available to cover every aspect of education involved in an insulin start' (2013, p 147).

Structured programme

The **National Institute for Health and Care Excellence (NICE 2011)** states that a structured programme for patients starting on insulin should include:

- structured education
- continuing telephone support
- frequent self-monitoring
- adjusting doses
- understanding diet
- managing hypoglycaemia
- managing acute changes in plasma glucose control values

- support from an appropriately trained and experienced health care professional
- injection technique including site selection and care
- managing sick days.

and should be:

- evidence-based
- quality assured
- built around a structured curriculum
- delivered by trained educators
- audited (www.nice.org.uk/Guidance/QS6/chapter/quality-statement-6-insulin-therapy).

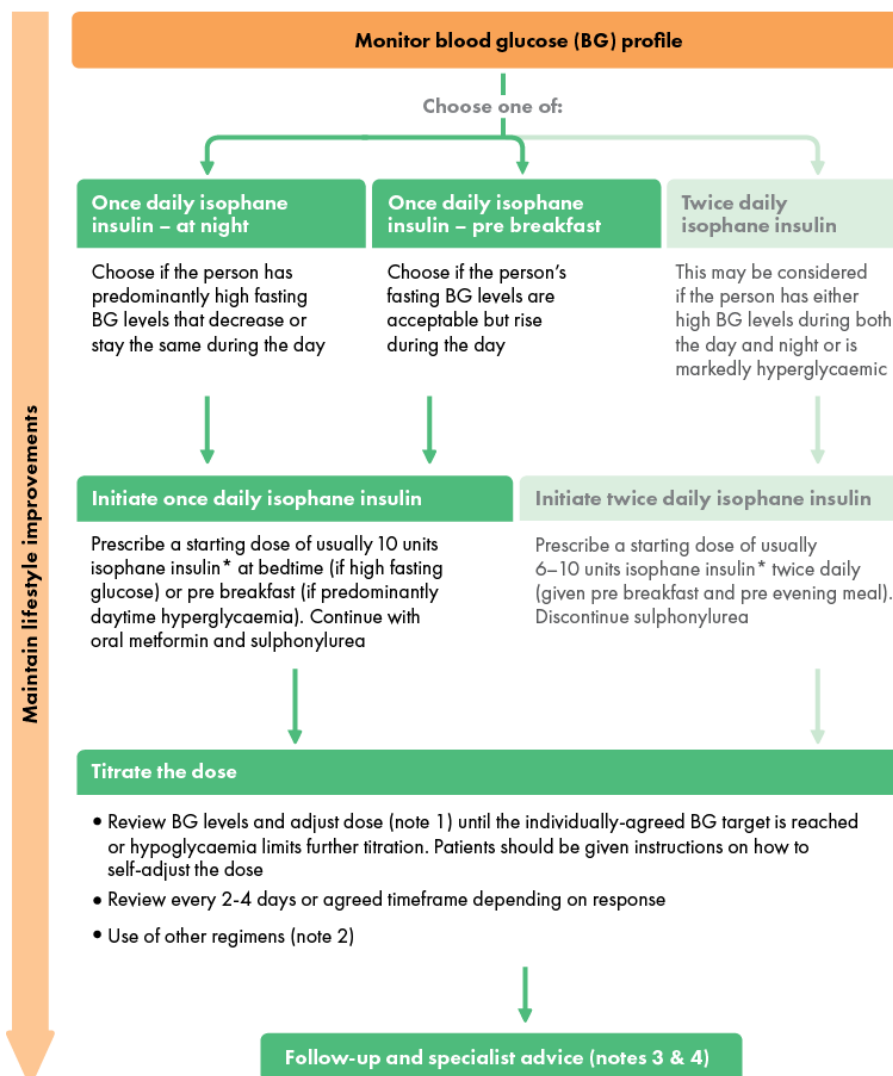


Guidelines

The New Zealand **Best Practice Advocacy Centre (BPAC)** guidelines for initiating insulin can be found here: www.bpac.org.nz/BPJ/2012/february/insulin.aspx

The **New Zealand Primary Care Handbook 2012** provides an algorithm for starting insulin on page 61.

Initiation of insulin in primary care



* Currently funded isophane insulin is Protaphane or Humulin NPH.

Waitemata District Health Board (DHB) produced a set of algorithms to optimise medication for people with type 2 diabetes. They include advice on treatment and insulin initiation (www.waitematadhb.govt.nz/LinkClick.aspx?fileticket=ENo58lPEzSY%3D&tabid=93&mid=685).

The **Institute for Clinical Systems Improvement (ICSI)** provides a series of decision algorithms including one on the initiation of insulin (https://www.icsi.org/_asset/3rrm36/Diabetes-Interactive0412.pdf).

In relation to the administration of insulin, there is no New Zealand or UK competency assessment or accreditation in place. However, the New Zealand **National Diabetes Nursing Knowledge and Skills Framework** provides the following list of competencies for specialist diabetes nurses, the only ones listed as being able to initiate insulin:

- demonstrate proficient knowledge of insulin and insulin regimens and act as a resource for the person with diabetes and their family/whānau, and health care professionals
- describe potential insulin regimens and when each could be prescribed
- explain how to manage missed or incorrect insulin dose
- assess the person with diabetes' educational needs and deliver appropriately
- provide care and education to assist with the safe transition from oral therapy to insulin therapy
- maintain contemporary knowledge of current practice and new developments (<http://nzssd.org.nz/documents/dnss/National%20Diabetes%20Nursing%20Knowledge%20and%20Skills%20Framework%202009.pdf>).

Similarly, an Integrated Career and Competency Framework for Diabetes Nursing was developed in the UK (TREND-UK 2011), which outlines the competencies for diabetes nurses at various levels. Insulin initiation is included at the 'expert/proficient' level requiring the following competencies, over and above those required of a 'competent' diabetes nurse:

- demonstrate a broad knowledge of different insulin types (ie, action, use in regimens)
- demonstrate a broad knowledge of GLP-1 receptor agonists (eg, drug type, action, side-effects)
- assess individual patients' self-management and educational needs and meet these needs or make appropriate referral
- support and encourage self-management wherever appropriate
- initiate insulin or GLP-1 receptor agonist therapy where clinically appropriate
- recognise when injection therapy needs to be adjusted
- recognise the potential psychological impact of insulin or GLP-1 receptor agonist therapies and offer support to the person with diabetes or their carer
- recognise signs of needle fear/needle phobia and offer strategies to help manage this (www.diabetes.org.uk/Documents/Professionals/Competencies/An%20Integrated%20Career%20and%20Competency%20Framework%20for%20Diabetes%20Nursing_TREND_2011.pdf).



Implementation advice

The **New Zealand Primary Care Handbook 2012** provides the following implementation advice:

Prior to initiating insulin therapy, it is essential that the patient regularly self-monitors blood glucose levels to assist decision-making about an appropriate insulin regimen.

Assessing blood glucose profile: practice points.

- Educate the patient on how to measure blood glucose levels using a meter and how to record results using a log book (see Appendix J for an example) to determine their current blood glucose profile.
- Review recorded blood glucose results with the patient to identify their current blood glucose profile and 'problem' times of the day.
- Use their blood glucose profile to help you and the patient decide on an appropriate insulin regimen (see Appendix J, which includes a logbook interpretation as an example).

Best Practice Advocacy Centre (BPAC 2012) includes the following information:

General practitioners may be reluctant to begin insulin treatment due to:

- the complexity of the training required to educate the patient
- a lack of time and resources to perform adequate consultations and follow-up
- a lack of practice training and access to educators
- concerns that insulin increases the risk of hypoglycaemia
- concern that patients will view insulin as a 'shortcut' and become less compliant with oral hypoglycaemic medication and lifestyle changes
- the possibility of weight gain that is associated with insulin treatment.

These issues need to be carefully considered and practice strategies put in place to address any barriers to providing treatment.

In addition, patients may be reluctant to begin insulin treatment due to:

- the fear of injections and the inconvenience of performing them
- the need for regular monitoring of blood glucose levels
- social discomfort surrounding the need for injections, or fear of loss of employment if their job involves driving
- a feeling that insulin initiation means that they have failed and are 'at the end of the line'
- concern over adverse effects such as weight gain and hypoglycaemia that are associated with insulin.

In order to allay concerns, it is important that patients understand that having type 2 diabetes means they have a progressive shortage of insulin to manage glucose levels over time and that medicine needs will change – beginning insulin does not mean that they have failed. Insulin types and delivery systems have improved over the years and injections now cause minimal discomfort while allowing discreet use. Many patients also report increased energy levels and wellbeing following insulin initiation.

It is usually beneficial to include the patient's partner or family in discussions about insulin initiation. If patients are particularly reluctant, a two-month trial period can also be suggested, after which point the patient can reassess their decision.

Health Mentor Online provides education and knowledge self-assessment on insulin and its initiation as well as other diabetes related topics. The resource is free for registered nurses employed as Practice Nurses and can be accessed by other health professionals by arrangement (<http://pro.healthmentoronline.com/>).

NZ Guidelines Group: The following advice on patient education associated with the initiation of insulin is provided by a NZGG Diabetes Advisory Group (2011).

Your patient will need education and advice on:

- self-monitoring of blood glucose
 - when to test, how to test, how to record in a log book style
 - test if they have symptoms of hypoglycaemia
 - increase frequency of testing if unwell
- insulin regimen
 - which insulin preparation
 - what the dose is, and when to administer it
 - how to use the insulin injection device
 - how to titrate the dose (if this is appropriate at this stage)
- how to administer insulin
- how to store the insulin and how to dispose of ‘sharps’
- dietary and lifestyle advice
 - maintaining a healthy body weight by healthy eating and exercise
 - the risk of hypoglycaemia with excess alcohol consumption
- managing hypoglycaemia
 - how to recognise the symptoms of hypoglycaemia
 - how to manage and prevent episodes of hypoglycaemia
- driving: legal and practical issues
 - ensure the patient understands their responsibility to maintain a reasonable level of glycaemic control while minimising their risk of hypoglycaemic episodes
 - if the patient is a vocational driver please refer for specialist advice
 - refer to the NZ Transport Agency Medical aspects of fitness to drive: A guide for medical practitioners (July 2009).

Dose titration

BPAC (2012) states that:

Patients require adequate education and training before they begin SMBG and self-administering insulin. It should be made clear that the initial dose of insulin is merely a starting point from where titration will be based – a common error is to initiate but not to titrate the dose effectively. Patients can be safely taught to self-adjust insulin doses in response to blood glucose levels, however, follow-up is essential. The need for continued exercise to prevent weight gain should also be emphasised. Practice staff training patients with type 2 diabetes to self-administer insulin need to have a thorough working knowledge of all the practical aspects of insulin treatment. In some DHBs training programmes for health professionals are run by diabetes nurse educators. In some cases it may be necessary for practices to contact manufacturers for specific product training.

After the initiation of insulin, twice weekly phone calls to the patient are recommended in combination with face-to-face meetings as required, until satisfactory glycaemic control is achieved. From this point, regular contact between the patient and the practice should be maintained, as blood glucose levels may be affected by other illnesses and insulin dose adjustments may be required. A face-to-face meeting approximately one month after initiation is also recommended to assess the need for regimen adjustment.

It should be emphasised to all patients, before they begin taking insulin, that medication is not a substitute for a healthy lifestyle and that behavioural strategies such as exercise, healthy eating and smoking cessation should still continue. Alcohol consumption should be moderate as this increases the risk of hypoglycaemia in patients taking insulin (p 25).

A guide to dose titration following the initiation of insulin is provided on page 62 of the New Zealand Primary Care Handbook 2012.

Canadian guidelines can be found here:

(<http://guidelines.diabetes.ca/Browse/Appendices/Appendix3>).



Implementation examples / innovations



Hutt Valley DHB

Hutt Valley DHB has developed a collaborative venture between a local primary health organisation (PHO) and the specialist diabetes service. The 'Diabetes Action' programme aims to facilitate general practice teams to provide improved diabetes care through the provision of a two-day education programme for practice nurses. The programme is delivered by the specialist nursing team and nurses are then certified to provide care to people with type 2 diabetes. The practice is then funded to provide their patients with three additional visits to follow up on care planning, monitor progress and provide ongoing diabetes education. Multidisciplinary workshops on insulin management are provided by the endocrinologist and specialist nursing team, after which practice teams are encouraged to commence insulin in people with type 2 diabetes in collaboration with the specialist service. In particular, the practice nurses are supported by the local clinical nurse specialists through telephone liaison, joint consultations and yearly update sessions (Diabetes Care Workforce Service Review Team 2011).



Capital & Coast DHB

Capital & Coast District Health Board has developed a similar practice model designed to take secondary care into the community in the form of upskilling and mentoring practice nurses to increase their support of people with diabetes and do insulin starts. Building on initial outreach work and diabetes services developed by the PHO and Compass Health with nurses and GPs in Newtown and Porirua, the 'Nursing Practice Partnership – a Diabetes Care Improvement Package' was trialled with Karori Medical Centre in 2011. At that point, the nurses provided diabetes annual reviews but no additional diabetes services, such as Care Plus, were run by GPs. A Diabetes Clinical Nurse Specialist (DCNS) from the Diabetes Specialist Service started by running specialist clinics in the practice and gradually developed the knowledge and skills of two Practice Nurses to enable them to take on the role of diabetes nurse 'champions'. This was achieved primarily by working alongside them to build confidence and competence. The online diabetes learning modules provided by Health Mentor Online

(<http://pro.healthmentoronline.com>) were also used to increase the nurses' knowledge. The DCNS has gradually reduced her personal involvement in the practice but supports the Practice Nurses who now run nurse-led diabetes clinics including insulin starts. The partnership model is currently being rolled out to 15 practices identified as having high numbers of patients with or at risk of developing diabetes, with the hope that all practices in the DHB will be included by next year. The package also involves working with GPs in practices, with endocrinologists holding peer and case reviews with practice teams, including virtual clinics for nurse champions and GPs to attend (www.nursingreview.co.nz/issue/june-2014/close-to-home-better-nurse-led-diabetes-care-on-your-back-doorstep/#.U7iuLSwrjIU).



Bancroft et al (2013) longitudinal study

Bancroft et al (2013) are currently running a longitudinal study of outcomes associated with a patient self-titration model of care involving the use of titration protocols. Initial three-month results based on 26 participants have found a mean increase in body weight of 2 kg and a mean drop in HbA1c of 1.6%. All participants attributed improved skills, knowledge and confidence in insulin dose adjustment and diabetes self-management to the Model of Care and all agreed or strongly agreed that the protocols were easy to use. Follow up will continue for a further 18 months to determine longer term outcomes.



Southern PHO

Southern PHO has developed an insulin initiation programme for people with type 2 diabetes. It is based on the New Zealand Guidelines Group (2011) document pertaining to the management of type 2 diabetes. Details can be found here: (http://southernpho.health.nz/downloads/complete_insulin_initiation_info_to_medtech_practices_27-09-11.pdf).



Assessment tools

Best Practice Advocacy Centre (BPAC) NZ provides a clinical audit for the initiation of insulin for people with type 2 diabetes who are on oral agents and have poor glycaemic control.

The audit is in two parts. Part 1 is designed to audit the trigger point for initiation of insulin in people using it, part 2 is designed to audit the escalation of treatment for people with type 2. Forms for recording data are provided.

Part 1

Auditing the current 'trigger point' for the initiation of insulin in patients with type 2 diabetes in your practice:

- Identify patients to audit
 - Step 1: Using the query builder in your Practice Management System (PMS), identify patients with type 2 diabetes who are already on insulin.
- Work out your 'current trigger point' for initiating insulin
 - Step 2: From the patient's notes record the HbA1c level at which treatment with insulin was initiated. (Use the data sheet to record your data).

- Identify any gaps in your practice
 - Step 3: Based on current evidence, identify an HbA1c level at which patients with type 2 diabetes in your practice should be initiated on insulin, this is your target ‘trigger point’.
 - Step 4: Using data from Step 2 above, calculate the average HbA1c at which treatment with insulin was initiated. What is the gap between this and your target ‘trigger point’?

Part 2

Auditing the escalation of treatment for patients with type 2 diabetes in your practice:

- Identify patients to audit
 - Step 1: Using the query builder in your PMS, identify 20 patients with type 2 diabetes on metformin.
- Identify any gaps in your practice
 - Step 2: Identify patients from your sample with an HbA1c greater than or equal to 64 mmol/mol.
 - Step 3: Using the patient’s notes, establish whether the patient’s dose of metformin has been titrated to the maximum tolerated dose. (Use the data sheet in Appendix One to record your data)
 - Step 4: Use this data to:
 - a. calculate the proportion of these patients that are not on a maximum tolerated metformin dose
 - b. calculate the proportion of these patients that have an HbA1c greater than or equal to your target ‘trigger point’ for initiating insulin from Part 1 above.

Patients identified in step four above represent the gap between ‘ideal’ practice and your current practice. These patients should be reviewed with a view to escalating treatment or initiating insulin (www.bpac.org.nz/resources/other/audits/bpac_insulin_audit_wv.pdf).

The **National Institute for Health and Care Excellence** (NICE 2011) provides the following quality measures.

Process

The proportion of people with diabetes starting insulin therapy that is initiated by a trained health care professional.

Numerator	The number of people in the denominator starting insulin therapy initiated by a trained health care professional
Denominator	The number of people with diabetes requiring insulin therapy

The proportion of health care professionals initiating insulin therapy who have documented appropriate training for starting and managing insulin.

Numerator	The number of health care professionals in the denominator having documented appropriate training for starting and managing insulin
Denominator	The number of health care professionals initiating and managing insulin therapy

The proportion of people with diabetes who receive ongoing structured support to initiate and manage insulin therapy.

Numerator	The number of people in the denominator receiving ongoing support to initiate and manage insulin therapy
Denominator	The number of people with diabetes starting insulin therapy



Resources

The following article (Levich 2011) reviews **the benefits of intensive glycaemic control** in type 2 diabetes, therapeutic goals and guidelines, advances in insulin therapy, and the contribution of nurses to overcoming barriers to insulin initiation and related aspects of diabetes care (www.dovepress.com/diabetes-management-optimizing-roles-for-nurses-in-insulin-initiation-peer-reviewed-article-JMDH).

Information for people with type 2 diabetes who are starting insulin is provided by Waitemata DHB here:

www.waitemataadhb.govt.nz/LinkClick.aspx?fileticket=rCjcrboKkoM%3D&tabid=124. It covers the need for insulin and how it works, the different types, how to store it, how to administer it, blood glucose monitoring, hypo- and hyperglycaemia and how to manage them. It is also available in Chinese, Korean, Tongan and Samoan.



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Standard 8

People with diabetes who do not achieve their agreed targets should have access to appropriate expert help.

Key practice points

- People with diabetes are at significantly greater risk for cardiovascular disease than the rest of the population.
- This risk is even greater in Māori, Pacific, Asian and South Asian people.
- Individualised glycaemic and cardiovascular risk targets should be agreed and documented using shared decision-making.
- People with diabetes who do not meet their agreed targets should be reviewed and treatment/support should be modified as required.
- If necessary, people not meeting their targets should have access to specialist services.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure procedures are in place to enable people with diabetes to agree and document glycaemic and cardiovascular risk targets with their health care professional. If targets are not achieved within a realistic timeframe, appropriate, expert help is provided.

Health care professionals ensure they agree and document glycaemic and cardiovascular risk targets with people with diabetes and provide ongoing review. Where targets are not met within a realistic timeframe, they provide or refer the patient on to receive expert help as required.

Planners and funders ensure they commission diabetes services that enable people with diabetes to agree and document glycaemic and cardiovascular risk targets with their health care professional and receive ongoing review of treatment and expert assistance when targets are not met.

People with diabetes agree on glycaemic and cardiovascular risk targets with their health care professional, and have their treatment regularly reviewed. If targets are not met, they receive expert help.



Introduction

Diabetes and cardiovascular disease (CVD) affect a growing number of New Zealanders each year and have a disproportionate effect on Māori, Pacific people and people of South Asian origin. These diseases affect New Zealanders' quality of life and life expectancy, and the impact is increasing with an ageing population and lifestyle changes. (Ministry of Health 2011, p 2). Good glycaemic control has benefits for microvascular outcomes and, if started early enough, on long term macrovascular outcomes. It is recommended that individualised HbA1c targets be set by individuals and clinicians in partnership, taking into consideration the potential duration of the individual's exposure to hyperglycaemia. The New Zealand Primary Care Handbook 2012

indicates that, in general, a target of 50–55 mmol/mol is appropriate but individual factors, particularly age, should be considered when setting targets.

Tighter control should be considered for younger people due to their higher lifetime risk of diabetes-related complications (New Zealand Primary Care Handbook 2012). HbA1c levels should be monitored regularly to assess whether targets are being met and to enable review if not (Best Practice Advocacy Centre 2013). It has long been accepted that there is a relationship between diabetes and cardiovascular disease (CVD) and a significant number of people have both conditions. People with type 2 diabetes are two to four times more likely to suffer from CVD, which is the main cause of death in people with diabetes (Ministry of Health 2011). It is suggested that fewer than 10% of diabetes patients in the US reach their goals for systolic blood pressure, LDL cholesterol and HbA1c. Clinicians' failure to intensify medication therapy, despite elevated CVD risk factors, is a primary reason (Schmittiel et al 2008).



Guidelines

While the **New Zealand Primary Care Handbook 2012** remains the main reference for health care practitioners, an additional guide, published in 2013 provides updates for CVD risk assessment, management and diabetes screening advice. This guide helps support practitioners to deliver more heart and diabetes checks for their patients. In addition to the guide, a quick reference sheet summarises the key updates. An online version of the handbook and the 2013 updates are available on the Ministry of Health website (www.health.govt.nz/system/files/documents/publications/cardiovascular-disease-risk-assessment-updated-2013-dec13.pdf).

The New Zealand Primary Care Handbook 2012 provides information on cardiovascular risk assessment and management and management of type 2 diabetes. The risk appraisal is of overall risk for micro- and macrovascular complications. They recommend that people identified as being at high risk of complications should receive more intensive intervention and follow-up. It can be accessed at: www.health.govt.nz/system/files/documents/publications/nz-primary-care-handbook-2012.pdf.

The **Best Practice Advocacy Centre** (BPAC) has produced a series of articles related to Standard 8, one of which provides guidelines, another implementation advice. 'Improving glycaemic control in people with type 2 diabetes: Expanding the primary care toolbox' (www.bpac.org.nz/BPJ/2013/June/docs/BPJ53pages6-15.pdf).

For specific insulin and cardiovascular risk management advice see Standards 5, 6 and 7.



Implementation advice

The **Australian Clinical Management Care Guidelines for type 1 diabetes** state that education (see Standard 1) and psychological support (see Standard 4) are an essential component of standard diabetes care and recommend 'intensified education and psychological support programs should be considered when treatment goals are not being met'(p 7). The practice points for this are:

- educational and psychological interventions should be culturally, developmentally and age appropriate
- the multidisciplinary diabetes health care team should aim to maintain consistent contact with people with diabetes and their families/whānau or carers
- it is important for the multidisciplinary diabetes team to provide preventive interventions for patients and families/whānau (include training parents in effective behaviour-management skills) at key developmental stages, including after diagnosis and before adolescence. The aim of these interventions is to emphasise appropriate family/whānau involvement and support in diabetes management, effective problem-solving and self-management skills, and realistic expectations about glycaemic control (Delamater 2009)
- diabetes care teams should have appropriate access to mental health professionals to support them in the delivery of psychological support
- flexible intensive insulin therapy programs, such as DAFNE, aim to provide dietary freedom for people with type 1 diabetes (www.apeg.org.au/portals/o/guidelines1.pdf).

The **Institute for Clinical Systems Improvement (ICSI)**

(https://www.icsi.org/_asset/3rrm36/Diabetes-Interactive0412.pdf algorithms) suggest the following for when treatment goals are not met:

- Recommendations
 - If patients are having difficulty achieving treatment goals, consider a modification of treatment goals. In addition, evaluate for potential contributing issues such as adherence, depression and obstructive sleep apnoea (see Standards 1 and 4).
 - A referral to an extended care team clinician can be helpful; this could be as an endocrinologist or other specialist, diabetes educator (diabetes nurse specialist in New Zealand), dietitian or pharmacist.
- Modify treatment based on appropriate related guideline
 - Prevention and management of obesity (mature adolescents and adults) (see Standard 2)
 - Hypertension diagnosis and treatment (see Standards 5 and 6)
 - Lipid management in adults (see Standards 5 and 6)
 - Major depression in adults in primary care (see Standard 4).

Consider referral to diabetes care team or specialists

- Assess patient adherence (see Standards 4 and 5)

Non-adherence with medications can limit the success of therapy and help to explain why a patient is not achieving treatment goals. To screen for non-adherence, clinicians can ask patients open-ended, non-threatening questions at each office visit. The assessment should include probes for factors that can contribute to non-adherence (fear of adverse reactions, misunderstanding of chronic disease treatment, depression, cognitive impairment, complex dosing regimens, or financial constraints):

- assess the patient's knowledge of their condition and their expectations for treatment
- assess the patient's medication administration process
- assess the patient's barriers to adherence.

Interventions to enhance medication adherence should be directed at risk factors or causes of non-adherence. Interventions may include simplifying the medication regimen, using reminder systems, involving family/whānau or caregivers in care, involving multiple disciplines in team care, providing written and verbal medication instructions, setting collaborative goals with patients, and providing education about medications (including potential adverse effects) and about diabetes in general.

Evaluate for depression (see Standard 4)

There is a substantial increase in the prevalence of depression among people with diabetes as compared to the general adult population (Anderson 2001). Depression impacts the ability of a person with diabetes to achieve blood glucose control, which in turn impacts the rate of development of diabetes complications (de Groot 2001; Lustman 2001).

Identification and management of depression is an important aspect of diabetes care. Self-administered or professionally administered instruments, such as PHQ-9, are useful adjuncts to the clinical interview in the identification of depression. The ICSI Major Depression in Adults in Primary Care guideline provides more suggestions for the identification and management of depression. Intervention studies have demonstrated that when depression is treated, both quality of life and glycaemic control improve. Counselling may be effective, especially among those who are having difficulty adjusting to the diagnosis of diabetes or are having difficulty living with diabetes. Pharmacotherapy for depression is also effective.

Evaluate for obstructive sleep apnoea (OSA)

Sleep apnoea is a prevalent condition in obese patients with type 2 diabetes and is associated with significant comorbidities including hypertension, cardiovascular disease and insulin resistance. Consider referral of symptomatic patients for sleep evaluation.

Clinicians should be cognisant of potential obstructive sleep apnoea, especially among obese patients (ICSI, pp 17–18).

Diabetes care team

Ensure the patient has an adequate care team. This may include:

- diabetes nurse specialist
- dietitian
- podiatrist
- endocrinologist
- nephrologist
- neurologist
- cardiologist
- ophthalmologist
- vascular specialist.

Getting to know patients with type 2 diabetes and poor glycaemic control

One size does not fit all. 'People with type 2 diabetes and poor glycaemic control (HbA_{1c} >64 mmol/mol) are at increased risk of developing diabetes-related complications and cardiovascular disease (see Standard 3). Engaging with these patients and helping them overcome their individual barriers to achieving a healthier life are a priority for primary care. Where possible, the family/whānau of the patient should be encouraged to be involved in lifestyle changes. Diabetes management plans should be agreed upon using a shared decision-making approach. Treatment targets, including glycaemic control, need to be individualised taking into account patient characteristics, such as age, treatment preference or the presence of comorbidities. Primary care, nurse-led diabetic clinics are an effective way of engaging with and monitoring patients with type 2 diabetes' (www.bpac.org.nz/BPJ/2014/February/docs/BPJ58-diabetes.pdf).

Expert help

Access to expert help may not always be available as a workforce survey conducted by the Diabetes Care Workforce Service Review Team (Health Workforce New Zealand 2011) identified a considerable variation in the provision of diabetes specialist physician, nursing, dietitian and podiatry services between DHBs. In addition, the survey found that no DHB had a diabetes specialist physician service at the level recommended by the UK's Federation of the Royal College of Physicians (0.8 full-time equivalent [FTE] per 100,000); the national mean in New Zealand is 0.35 FTE. Recommendations arising from the review were that in order to meet the complex needs of those with diabetes services should consider:

- more mobile health care services
- care provided remotely via electronic communications, where appropriate
- primary health services to identify and manage high-risk individuals
- specialist interdisciplinary teams to focus on patients with more complex needs.



Implementation examples / innovations



Dunedin-based Registered Clinical Trial (RCT)

A Dunedin-based RCT (Coppell et al 2010) compared usual care with usual care plus intensive individualised dietary advice over a six-month period. There were 93 participants aged less than 70 with type 2 diabetes, HbA_{1c} greater than 53 mmol/mol despite optimal drug treatment, and at least two of overweight or obesity, hypertension and dyslipidaemia. After adjusting for age, sex, and baseline measurements, the difference in HbA_{1c} between the intervention and control groups at six months was highly statistically significant as were decreases in BMI and waist measurement. A decrease in saturated fat and an increase in protein in the intervention group were the most striking differences in nutritional intake between the two groups.



Assessment tools

In order to meet the requirements of this standard, individuals who are not achieving their targets first need to be identified. BPAC NZ have provided an audit process designed to identify and document the needs of people not meeting their targets in order to step up treatment and track progress in general practice. The following link leads to a document providing information, guidance on identification and audit sheets for data collection: (www.bpac.org.nz/Audits/docs/bpacnz_audit_diabetes_controlled.pdf).

The following indicators can be used to assess quality.

Process

The proportion of people with diabetes with agreed, documented targets.

Numerator	The number of people in the denominator with agreed, documented glycaemic and CVD targets
Denominator	The number of people with diabetes

The proportion of people with diabetes achieving their agreed targets.

Numerator	The number of people in the denominator achieving their agreed targets
Denominator	The number of people with diabetes

The proportion of people with diabetes who have received a review of treatment in the previous 12 months.

Numerator	The number of people in the denominator receiving a review of treatment in the previous 12 months
Denominator	The number of people with diabetes

The proportion of people with diabetes who are not meeting targets and receiving expert help.

Numerator	The number of people in the denominator who have received or been referred on for expert help with reaching targets
Denominator	The number of people with diabetes who are not meeting agreed targets

Audit checklist

- The individual and practitioner have discussed, agreed on and documented target levels of glycaemic and modifiable cardiovascular risk factors.
- Regular monitoring of targets is in place to assess progress.
- Individuals not meeting agreed targets are easily identified.
- Lifestyle issues are addressed and recommendations and support provided.
- Treatment is reviewed and altered if required to enhance control.
- Those not meeting targets despite optimal guideline based treatment are referred for expert help.
- Data is collected to monitor progress and for reporting purposes.



Resources

The **Institute for Clinical Systems Improvement (ICSI)** has produced a glycaemic control algorithm which can be found here: www.guideline.gov/algorithm/5391/NGC-5391_2.pdf.

New Zealand Primary Care Handbook 2012

www.health.govt.nz/system/files/documents/publications/nz-primary-care-handbook-2012.pdf



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Ministry of Health. 2011. Targeting diabetes and cardiovascular disease. Wellington: Ministry of Health. Retrieved from <https://www.health.govt.nz/system/files/documents/publications/targeting-diabetes-cardiovascular-disease.pdf>.

New Zealand Guidelines Group. 2012. *New Zealand Primary Care Handbook 2012* (3rd edition). Wellington: Ministry of Health. Retrieved from www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012.pdf.

Schmittziel JA, Uratsu CS, Karter AJ, et al. 2008. Why don't diabetes patients achieve recommended risk factor targets? Poor adherence versus lack of treatment intensification. *Journal of General Internal Medicine* 23(5): 588–94. doi: [10.1007/s11606-008-0554-8](https://doi.org/10.1007/s11606-008-0554-8).

Management of diabetes complications



Standard 9

All people with diabetes should have access to regular retinal photography or an eye examination, with subsequent specialist treatment if necessary.

Key practice points

- All people with diabetes are at risk of developing retinopathy. Māori and Pacific peoples have a higher incidence of moderate and severe diabetic retinopathy.
- There are minimum screening and monitoring requirements. Substantial available evidence shows cost effectiveness and benefits of eye screening and monitoring.
- The New Zealand National Diabetes Retinal Screening Grading System and Referral Guidelines (Ministry of Health 2008) provide guidance for screening and monitoring. These are currently under review.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that people with diabetes have access to regular retinal photography or an eye examination, with subsequent specialist treatment if necessary.

Health care professionals ensure they are competent to assess diabetic eye disease and manage it appropriately.

Planners and funders ensure they commission services that provide people with diabetes access to regular retinal photography or an eye examination, with subsequent specialist treatment if necessary.

People with diabetes should have access to regular retinal photography or an eye examination, with subsequent specialist treatment if necessary.



Introduction

All people with diabetes are at risk of developing retinopathy (Ministry of Health 2008). Diabetic retinopathy (DR) is a chronic, progressive, and potentially sight-threatening disease of the eye (The Royal College of Ophthalmologists 2012). Studies suggest Māori and Pacific Island peoples have a higher incidence of moderate and severe diabetic retinopathy than New Zealanders of European descent (Papali'i-Curtin et al 2013; Simmons et al 2007). The most significant risk factor for DR is time since diagnosis (Ministry of Health 2008), but prolonged elevated blood glucose (hyperglycaemia) and other conditions linked to diabetes such as high blood pressure (hypertension) also contribute to development of the condition (Ministry of Health 2008; The Royal College of Ophthalmologists 2012). Prompt referral after diagnosis of diabetes (type 2) and five years post diagnosis (type 1) and regular screening and monitoring thereafter are imperative because DR is often asymptomatic and damage to the eye may have occurred prior to a diagnosis of diabetes (American Diabetes Association 2014).



Guidelines

The New Zealand guidelines referred to for DR screening are the **National Diabetes Retinal Screening Grading System and Referral Guidelines** (Ministry of Health 2008). These are based on available evidence about retinal screening and referral and are currently undergoing review. The guidelines are specifically for ophthalmologists, optometrists and those involved in photographic retinal screening but are a relevant reference tool in order to provide a nationally consistent approach for screening, recall and referral for individuals diagnosed with diabetes. A summary as it relates to Standard 9 is as follows:

- all people with diabetes are at risk of developing retinopathy
- duration of diabetes is one of the most important factors determining presence of diabetic retinopathy (DR)
- substantial evidence is available showing the cost effectiveness and benefits of eye screening as part of DR prevention and prevention of loss of vision.

The **Screening for Diabetic Retinopathy in Primary Care** (The Best Practice Advocacy Centre New Zealand 2010) is a useful document for other health care providers/professionals. It contains background, a referral process for screening, screening intervals and methods, management suggestions for risk factors for DR and a summary of DR characteristics and its treatment.



Implementation advice

Guidelines for the *minimum* intervals for retinal monitoring (Ministry of Health 2008, p 6; Associate Professor Gordon Sanderson, personal communication, 18 June 2014) are presented below.

Retinal screening	Type 1 diabetes	Type 2 diabetes
Intervals for screening	<p>Adult – screen when the duration of diabetes is more than five years.</p> <p>Children – Screening can be delayed until puberty or five years after diagnosis, whichever is the earlier.</p> <p>* Regular retinal screening should be conducted at least every two years if no abnormality is detected.</p>	All patients should be screened as soon as possible after diagnosis.
Retinal/photo monitoring	Once any diabetic retinopathy is detected, the frequency of the assessments will need to be increased depending on the severity of the retinopathy and the risk factors for progression to sight-threatening disease. More information can be found on Table 5 – Grading for Diabetic Retinopathy (section 4.2) (Ministry of Health 2008).	
During pregnancy	<p>* All pregnant women should be screened in the first trimester of their pregnancy. Those who have no retinopathy and no clinical modifiers can then continue their normal two-yearly screening – see ‘Table 7 – Grading and referral guidelines for women who have diabetes and are also pregnant’ (section 4.4) for more information. Those with:</p> <ul style="list-style-type: none"> • some retinopathy will require more frequent screening or monitoring throughout the pregnancy • more advanced retinopathy will require referral to an ophthalmologist for ongoing review during pregnancy. <p>Also see Section 4.2, Grading for Diabetic Retinopathy.</p>	

* Some patients may require increased or reduced ‘ongoing monitoring’ (eg, patients with diet controlled diabetes with HbA1c less than 53 mmol/mol). These intervals are guidelines and ophthalmologists may vary monitoring intervals providing sensitivity and quality are not compromised.

Additional considerations

- Retinal photo quality assurance programmes should be also implemented, and accredited photo screening and photo grading training programmes should be developed (Diabetes Workforce Service Review) www.health.govt.nz/system/files/documents/pages/diabetes-workforce-service-review.pdf and Hutchins et al (2012).
- Training on requirements for correct data entry into the Ophthalmology Digital Healthcare Database introduced July 2011. See also Service Specifications Tier 2 and 3 and information on pages 16–20 of Ministry of Health (2008) document relating to minimum data set for each enrolled person and for each retinal screening examination.
- An information system that can provide:
 - an effective recall system for individuals diagnosed with DR
 - referral for DR assessment/follow up from any point of contact
 - access to complete data records by all health care providers involved in an individual's care
 - data collection for nationwide monitoring generated from key national monitoring indicators such as retinopathy grades and referral to a monitoring programme and/or treatment
 - reporting of outcomes advancing reduction of inequalities
 - consideration around workforce issues to meet demand of specialist screening
 - targeted, culturally appropriate screening programmes for Pacific peoples.

Pacific people have significantly higher prevalence of diabetes than all other ethnic groups, affecting nearly 8.4% of the population. In comparison, Māori have significantly lower prevalence with 4.8% of the population affected (Health Quality and Safety Commission New Zealand 2014). However, rates for Māori are still higher than the general population. The Health Quality and Safety Commission data included all ages so comparison with other figures specific to the adult population is not possible (Health Quality and Safety Commission New Zealand 2014).



Implementation examples / innovations



Whangaroa Health Services Trust

Diabetes clinic at: www.maoridiabetes.co.nz/index.php?page=59.



Meeting the needs of Māori with diabetes

A master's thesis evaluating a nurse-led service (Janssen 2008):
<http://researcharchive.vuw.ac.nz/xmlui/bitstream/handle/10063/884/thesis.pdf?sequence=2>.



Health Navigator NZ and Auckland District Health Board (ADHB) 2011

Self-management support toolkit for frontline health care practitioners working with people who have chronic disease or long-term health conditions:
www.wrpho.org.nz/documents/self_management_toolkit.pdf.



Canterbury DHB

The community delivery of diabetes retinal screening, implemented in February 2013, has resulted in at least 1000 additional people screened by one of the six contracted optometrists, during 2013, and the mobile camera providing screening clinics in Kaikoura, Ashburton and Christchurch Prison (www.cdhb.health.nz/About-CDHB/Who-We-Are/CDHB-Board-Committees/Documents/Board%202014%2013%20February%20Open%20Agenda%20PDF%20Copy.pdf).



Targeting Diabetes and Cardiovascular Disease

Better Diabetes and Cardiovascular Services (Ministry of Health National Health Board): www.health.govt.nz/system/files/documents/publications/targeting-diabetes-cardiovascular-disease.pdf.



Mangere Community Health Trust Diabetic Eye Screening Service

This service is free to patients and available from many general practice rooms and from established clinics in Mangere, Otara and Papakura where routine diabetic care is provided. The Trust's mobile screening service is currently operating at 21 sites throughout Counties Manukau. The Trust has raised funds to purchase two digital retinal cameras as well as vans for transporting the equipment. They currently operate 8 to 12 clinics a week around South Auckland: www.mangerehealth.org.nz/services-list/retinal-screening/.



Assessment tools

Structure

Evidence of local arrangements to ensure that people with diabetes are assessed at required intervals for the risk and presence of diabetic eye disease, and if present, are managed appropriately.

Process

The proportion of people with diabetes who are assessed at required intervals for the risk and presence of diabetic eye disease.

Numerator	The number of people in the denominator who are assessed at required intervals for the risk and presence of diabetic eye disease.
Denominator	The number of people with diabetes

The proportion of people with diabetic eye disease who are monitored and managed appropriately.

Numerator	The number of people in the denominator receiving retinal monitoring at required intervals and appropriate management
Denominator	The number of people with diabetic eye disease

Outcome

Reduction in the incidence of diabetic eye disease and related blindness.

The Ministry of Health Retinal Screening system and referral guidelines have specific data collection requirements: www.health.govt.nz/publication/national-diabetes-retinal-screening-grading-system-and-referral-guidelines-2006-and-resources-2008.



Resources

American Diabetes Association – Standards of Medical care in diabetes

- http://care.diabetesjournals.org/content/37/Supplement_1/S14.full.pdf+html

Diabetes New Zealand

- www.diabetes.org.nz/about_diabetes/complications_of_diabetes/eyes

Diabetes Review

- www.bestpractice.net.nz/feat_mod_diab.php

The Common Form

- www.bestpractice.net.nz/feat_mod_chronicCare.php

New Zealand brochures in Te Reo, Pacific languages

- <https://www.healthed.govt.nz/resource/keeping-well-diabetes-te-reo-m%C4%81ori-version>
- <https://www.healthed.govt.nz/resource/keeping-well-diabetes-cook-islands-m%C4%81ori-version>
- <https://www.healthed.govt.nz/resource/keeping-well-diabetes-niuean-version>
- <https://www.healthed.govt.nz/resource/keeping-well-diabetes-s%C4%81moan-version>
- <https://www.healthed.govt.nz/resource/keeping-well-diabetes-tongan-version>

Everybody.co.nz diabetes and what is diabetic retinopathy?

- www.everybody.co.nz/page-8756cae3-9f3c-4190-9c5a-135ff70348ce.aspx

Massachusetts Health Department Clearing House Department Health

- <https://massclearinghouse.ehs.state.ma.us/product/DB704.html>

Massachusetts Department of Public Health Diabetes Prevention and Control Programme ‘How to Protect your Eyes’ brochure

- <http://files.hria.org/files/DB704.pdf>

Diabetes NZ – Diabetes and your eyes

- www.diabetes.org.nz/about_diabetes/complications_of_diabetes/eyes

Health Mentor Online – Resources for people with diabetes

- www.healthmentoronline.com



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Papali'i-Curtin A, Dalziel D. 2013. Prevalence of diabetic retinopathy and maculopathy in Northland, New Zealand: 2011–2012. *The New Zealand Medical Journal* 126(1383): 20–8. Retrieved from <http://journal.nzma.org.nz/journal/126-1383/5847/>.

Simmons D, Clover G, Hope C. 2007. Ethnic differences in diabetic retinopathy. *Diabetic Medicine* 24(10): 1093–8. doi: 10.1111/j.1464-5491.2007.02227.x.

The Royal College of Ophthalmologists. 2012. *Diabetic Retinopathy Guidelines*. London, UK: Scientific Department, The Royal College of Ophthalmologists.

Standard 10

All people with diabetes should have regular checks of renal function (eGFR) and albuminuria or proteinuria (ACR or PCR) with appropriate management and/or referral if abnormal.

Key practice points

- Chronic kidney disease affects 10% of the population with a higher burden of disease in Māori, Pacific, Asian and South Asian populations.
- People with diabetes are at risk of developing renal disease.
- Early intervention slows progression to end stage renal failure.
- Albuminuria is a marker of renal damage, ranging from normoalbuminuria through microalbuminuria to macroalbuminuria and heavy proteinuria.
- There are minimum screening and monitoring requirements – refer to New Zealand Primary Care Handbook 2012 along with Kidney Health New Zealand and Best Practice Advocacy Centre NZ.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that diabetes services recall and review people with diabetes for an assessment of renal function and albuminuria or proteinuria and provide resources to enable appropriate management.

Health care professionals ensure they are competent to assess people with diabetes for renal function and albuminuria or proteinuria, and manage them appropriately.

Planners and funders ensure they commission services that assess for renal function and albuminuria or proteinuria and manage them appropriately.

People with diabetes are assessed for renal function and albuminuria or proteinuria and, if these are present, they are properly managed.



Introduction

Chronic kidney disease (CKD) is a silent disease and a potential complication arising from diagnosis of diabetes. In New Zealand, at the end of 2012, 2469 patients were reported to be on dialysis with 1520 successfully transplanted patients (Australia & New Zealand Dialysis and Transplant Registry 2013). It is estimated that CKD affects approximately 10% of the population, with Māori, Pacific, Asian and South Asian people experiencing a higher burden of this disease (New Zealand Guidelines Group 2012; The Best Practice Advocacy Centre New Zealand 2009). Māori with diabetes are at least three times more likely to have renal failure than non-Māori with diabetes. Early identification of individuals at high risk of renal complication post diagnosis of diabetes is important (New Zealand Guidelines Group 2012) as,

‘early intervention slows progression of end-stage renal disease and decreases cardiovascular risk’ (The Best Practice Advocacy Centre New Zealand 2009, p 24).



Guidelines

There does not appear to be an overarching renal guideline for New Zealand; however, a national consensus statement is in development. Guidelines pertaining to CKD and renal function for diabetes type 1 and 2 are distributed across a number of national and international guidance documents:

- for identification of risk for diabetes-related complications and management *specific* to diabetes type 2 refer to **New Zealand Primary Care Handbook 2012** (pp 50–55)
- for documents that provide specific information about CKD and management refer to *Chronic kidney disease (CKD): Management in general practice – summary guide* (Kidney Health New Zealand 2013) or *Making a difference in chronic kidney disease: Part 1 and 2* (Best Practice Advocacy Centre New Zealand 2009)
- the Kidney Disease Improving Global Outcomes Guidelines (Kidney International 2013) are a useful guidance across a range of issues pertaining to kidney disease. These can be found at: <http://kdigo.org/home/>.



Implementation advice

Prevention

- Whānau Ora models of care applied in practice (Health Workforce New Zealand 2011).
- Continued education to increase public awareness of and motivation for adopting healthy lifestyles, importance of nutrition and physical activity, and reducing obesity (National Renal Advisory Board 2006).
- Changes to the environments that positively influence nutrition and physical activity in at risk groups (National Renal Advisory Board 2006).
- Improvements in health service responsiveness to at-risk populations (National Renal Advisory Board 2006).
- Public campaign to heighten public motivation to find out about CKD or to identify at an early stage if they have the disease (National Renal Advisory Board 2006).

Early intervention

- Continued early proactive intervention on blood pressure, microalbuminuria, lipid and glycaemic control in primary care settings (Health Workforce New Zealand 2011).
- Establishment of specialist nurse clinics and outreach nephrology clinics with emphasis on diabetic renal disease (Health Workforce New Zealand 2011).
- Targeted screening for young individuals and ethnic groups most affected by CKD (Health Workforce New Zealand 2011).
- Continued development of an appropriately enabled and multidisciplinary primary care workforce to deal with CKD in its earlier stages (National Renal Advisory Board 2006).

- Continued development of support/guidance from secondary care (National Renal Advisory Board 2006).
- Continued development of innovative approaches to primary/secondary consultation, such as greater ability of GPs to discuss issues with consultants. Other options in this area include enhanced capacity of nurse specialists and general practitioners working across the interface with secondary care; guidelines for managing people in this pre-RRT stage through primary care; and enhanced support services.
- Continued innovations connecting GPs with secondary care.
- Build a strong interface between the sectors.
- Continued workforce development/recruitment of GPs and practice nurses to meet the required need in primary care.
- There is consensus that CKD should be classified by stage 1 to 5 and as stable or progressive as management of CKD depends on stage, level of CVD risk and other indications for referral. Recommended ongoing investigations depend on CKD stage. **Minimum** frequency for tests is shown below (Best Practice Advocacy Centre 2009):
 - Stages 1 and 2 – annually
 - Stage 3 to 5 – three-monthly then six-monthly if stable.
- An information system that can provide:
 - access to complete data records by all health care providers involved in an individual's care
 - accurate reporting of CKD incidence/stage on database.

Management

Within the New Zealand Primary Care Handbook 2012 (p 54), specific recommendations for microalbuminuria: monitoring and management in the context of diagnosed diabetes are stated as:

- microalbuminuria is the earliest sign of diabetic kidney disease and should be treated promptly if identified
- younger people with type 2 diabetes have a higher lifetime risk of renal complications
- annual screening for microalbuminuria using albumin:creatinine ratio (ACR) measurement is recommended. More frequent monitoring of renal status is indicated for Māori, Pacific Island and South Asian peoples
- those at moderate to high risk of diabetes-related complications (see Figure 3) should have their ACR measured six-monthly
- patients with confirmed microalbuminuria should be treated with an angiotensin-converting-enzyme (ACE) inhibitor or angiotensin 2 receptor blocker (ARB) whether or not hypertension is present
- combination ACE inhibitor and ARB therapy should not be used without recommendation of a diabetes or renal specialist
- use of loop diuretics instead of or in combination with thiazide diuretics is considered appropriate for patients with significant renal impairment (eGFR <45 ml/min/1.73m²).

The **New Zealand Primary Care Handbook 2012** (Table 4, p 55) details the appropriate management of raised blood pressure and microalbuminuria in type 2 diabetes.

In the 'Management of chronic kidney diseases in primary care: A national consensus statement' (not yet publicly released), two strategies to effectively manage CKD in primary care are identified: 'Recent pilot projects have demonstrated the effectiveness of two complementary strategies to improve management of CKD in primary care through the actions listed above. The

first strategy, an electronic desktop tool, facilitates the detection and management of CKD management in a patient population in a primary care setting. The second, nurse-led clinics, involves intensive management of a group of identified high-risk CKD patients in a primary care setting’.

This strategy involves a nurse managing a group of high-risk CKD patients through regular clinics:

- identified in the primary care practice
- using an individualised programme with each patient
- supported by specialist secondary care nursing and medical expertise
- aiming to improve identified risk factors for the patients.

During the clinics the nurse oversees management of the high-risk CKD patients by:

- producing an individualised care plan based on a comprehensive assessment
- focusing on education of patients about their condition and management
- monitoring and follow-up to ensure management optimisation of key patient parameters such as BP, blood sugars, cholesterol
- regular review of progress toward clinical goals with the patient
- maintenance of patient database to enable audit of practice.

To be successfully used the nurse-led clinic needs to fit into current general practice work patterns through:

- systems able to readily identify suitable high-risk CKD patients and provide appropriate recall appointments
- access to resources for patient education and protocols for patient management
- integration with medical management of CKD in primary care
- availability of specialist nurses to work in primary care settings
- support from secondary renal and diabetes services.

Given the current configuration of primary and secondary care, challenges to implementation include:

- availability of specialist nurses and effective clinical support from secondary care renal and diabetes services to initiate clinics and upskill primary care nurses and GPs
- development of processes for mentoring practice nurses to upskill them to undertake clinics
- funding of practice nurse time for free clinics for patients
- adequate protocols to integrate with medical management in primary and secondary care.



Implementation examples / innovations



Derivation and validation of a renal risk score for people with type 2 diabetes

This could be used as a modelling tool for DHBs and can be accessed here:
<http://care.diabetesjournals.org/content/36/10/3113.full>

Improved risk stratification at baseline may thus help to identify earlier those at increased risk of ESRD as well as aid future research into new interventions to reduce progression. Renal risk models 2, 3, and 4 demonstrated excellent discrimination and calibration in the validation cohort. These models were able to discriminate risk of ESRD events more accurately than using eGFR or albuminuria alone. The choice of model used clinically would depend on the variables available although, where all are available, DCS model 4 is recommended. The models also performed rather better than internationally available renal risk models. This may have been due to the inclusion of ethnic groups relevant to NZ as ethnicity contributed significantly to the models. In 2010, the Ministry of Health established demonstration pilots to test interventions to improve management of chronic kidney disease. The final reports for Christchurch and Northland are available on the HIRC website if you have log-in access or from the Ministry of Health. An article describing the community based Hawkes Bay CKD pilot study is available here: www.renalsociety.org/Resources/Documents/RSAJ/2013.11/walker.pdf



Christchurch

Report on Chronic Kidney Disease Project, Langimalie Clinic. The report is available here:
<http://ndsig.hiirc.org.nz/assets/sm/Resource31333/attachments/ws37bzdqri/Final%20Report%20on%20Langimalie%20CKD%20Project.doc?download=true>



Northland

Final report: Diabetes and chronic kidney disease pilot – December 2010 to December 2012. The report can be accessed here:
<http://ndsig.hiirc.org.nz/assets/sm/Resource31331/attachments/er8n3tzqnm/Final%20Report%20on%20Northland%20CKD%20pilot.pdf?download=true>



Hawkes Bay

The abstract of an article describing a pilot study on improving self-management in chronic kidney disease (Walker et al 2013) follows:

The burden of diabetic kidney disease continues to escalate at significant cost to the patient and health care system. Health literacy and self-management are critical to improving the outcomes of chronic conditions such as chronic kidney disease (CKD). This paper describes a community-based CKD pilot study implemented in New Zealand (NZ) based on a self-management and educational model of care. The aim of the pilot study was to implement a collaborative, community-based intervention using specialist nephrology nursing support in a primary care setting, targeting people at increased risk of developing end-stage kidney disease. We have previously reported this pilot study to be effective in

clinical terms by reducing proteinuria, improving blood pressure control, and reducing five-year absolute cardiovascular risk and to improve some patient-centred outcomes, (patients' knowledge of their health condition and medications/treatments, medication compliance, and adherence to a healthy lifestyle). In this article, we report the effect of the pilot on a more extensive range of self-management and patient-centred outcomes, such as patient perceptions around shared decision-making, care that is appropriate to their cultural beliefs and values, their propensity to monitor and act upon medical early warning signs, and the impact of their condition upon daily physical activities, feelings, and social and family life. All but two of the domains showed significant improvement during this study, indicating the potential benefits of self-management models of care for patient-centred outcomes in CKD patients.



Blood pressure control in Māori and Pacific patients with type 2 diabetes

Optimising blood pressure control in Māori and Pacific patients with type 2 diabetes mellitus and established diabetic nephropathy in New Zealand: The Delay Future End-stage Nephropathy due to Diabetes (DEFEND) Study. Dr C Hotu. PhD Thesis.

Synopsis: In a randomised controlled trial 69 Māori and Pacific patients with type 2 diabetes, moderate CKD and hypertension were randomised to conventional care or nurse-led community care intervention for 12 months. Community care patients received monthly visits by a nurse-led Māori and Pacific health care assistant for blood pressure measurement, checking adherence to medication, medication side effects and significant clinical events. If the blood pressure was above the target of 130/80 mmHg, a study doctor altered antihypertensives following a set protocol. Transport was offered to the community group for prescription collection, blood tests and study clinic appointments. Routine care continued for both groups but the usual care group only received GP and outpatient clinic care. The DEFEND group clinicians saw these patients at baseline and 12 months only and made no blood pressure management decisions. The model of care proved to be more effective than conventional care in lowering systolic BP, 24-hour urine protein and delaying progression of cardiac and renal end-organ damage. The author concludes from this analysis that ‘... this model of health care delivery is significantly more effective than conventional care in lowering systolic BP, and reducing cardiac and renal end-organ damage in these high-risk patients’ (Houtu 2013, ii).

Details can be found on the HIIRC site and is available to download and read in full text at: <https://researchspace.auckland.ac.nz/handle/2292/20586>.



Assessment tools

Structure

Evidence of local arrangements to ensure that people with diabetes have their renal function (eGFR) and albuminuria or proteinuria (ACR or PCR) assessed annually and that these are managed appropriately.

Process

The proportion of people with diabetes who have their renal function (eGFR) and albuminuria or proteinuria (ACR or PCR) assessed annually and are managed appropriately.

Numerator	The number of people in the denominator receiving an assessment for renal function and albuminuria or proteinuria during the previous 12 months and are managed appropriately
Denominator	The number of people with diabetes

Outcome

Reduction in the incidence of diabetic renal disease.

The **Best Practice Advocacy Centre** provides an audit tool for monitoring practice associated with Renal Function in Elderly People. This audit addresses the appropriate use of renal function tests in people aged over 75 years. It will allow practitioners to identify and assess those patients who have not received renal monitoring, eg, estimated glomerular filtration rate (eGFR) from serum creatinine or an albumin: creatinine ratio (ACR) or protein: creatinine ratio (PCR) during the previous year, and determine whether they should have it. (www.bpac.org.nz/Audits/renal-function.aspx).

Diabetic renal disease

Urinary ACR and a serum creatinine, with eGFR, are the recommended tests for assessing diabetic renal disease. General practitioners should aim to perform the tests on all patients with diabetes at diagnosis and then at diabetes check-ups at least annually.

Delay of progression of diabetic nephropathy

Created on 30 July 2012 by Primary Health Care Quality Research Unit, Wellington School of Medicine and Health Sciences, University of Otago.

This measure is one of two diabetes indicators that are intended to improve management of diabetic nephropathy in primary care. This measure identifies the proportion of patients with diabetes with proteinuria, or with two out of three abnormal albumin:creatinine ratio test results within 4 months that are prescribed an Angiotensin Converting Enzyme inhibitor or Angiotensin II antagonist. See more at: www.hqmnz.org.nz/measures/long-term-conditions.



Resources

Health professionals

Best Practice Advocacy Centre

Best Practice Journal making a difference in chronic kidney disease.

www.bpac.org.nz/BPJ/2009/July/kidney.aspx

Kidney Health New Zealand

Chronic kidney disease (CKD) management in general practice: summary guide.

www.kidneys.co.nz/resources/file/kidneyhealth_complete_pgs-2.pdf

Elley C, Robinson T, Moyes S, et al. 2013. Derivation and validation of a renal risk score for people with type 2 diabetes. *Diabetes Care* 36(10): 3113–20. Retrieved from: <http://care.diabetesjournals.org/content/36/10/3113.full>

The KHA-CARI Guidelines is an evidence-based project that began in 1999. This project is funded by the Kidney Health Australia and is managed by the CARI Guidelines Steering Committee, a sub-committee of Dialysis Nephrology & Transplantation (DNT) committee which reports to Kidney Health Australia and Australian and New Zealand Society of Nephrology (ANZSN).

Kidney Health Australia CARI guidelines – Chronic kidney disease guidelines. Retrieved from: www.cari.org.au/CKD/ckd_guidelines.html
KHA-CARI guideline research www.cari.org.au/kha-cari_research.html

Consumers

Diabetes and Kidney disease everybody.co.nz www.everybody.co.nz/page-a53665f1-9d59-43d4-9a94-89a27585ee73.aspx

Diabetes and your kidneys screening for early kidney disease is done on your urine, and is called microalbuminuria. You should have this test at least annually.
www.diabetes.org.nz/about_diabetes/complications_of_diabetes/kidneys National Kidney Disease Education Program (USA). Monitoring Your Kidney Health. Retrieved from: <http://nkdep.nih.gov/living/monitor-kidney-health.shtml>

Health Mentor Online

Online learning resource for people with diabetes: Healthmentoronline.com



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Walker R, Marshall MR, Polaschek N. 2013. Improving self-management in chronic kidney disease: a pilot study. *Renal Society of Australasia Journal* 9(3): 116–25.

Standard 11

All people with diabetes should be assessed for the risk of foot ulceration and, if required, receive regular review. Those with active foot problems should be referred to and treated by a multidisciplinary foot care team within recommended timeframes.

Key practice points

- People with diabetes are at increased risk of peripheral vascular disease and peripheral neuropathies.
- Foot screening is effective for identification of ulcers and complications.
- Māori and Pacific peoples have a higher incidence of ulceration leading to amputation.
- Individuals identified with high risk feet require intensive and lifelong management of their feet.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure access to appropriate treatment and review by a foot protection team for people with diabetes at risk of foot ulceration in accordance with national guidelines and locally agreed clinical pathways.

Health care professionals ensure they identify and manage people with diabetes at risk of foot ulceration in accordance with national guidelines and locally agreed clinical pathways.

Planners and funders ensure they commission services that provide access to regular review by a foot protection team for people with diabetes at risk of foot ulceration in accordance with national guidelines and locally agreed clinical pathways.

People with diabetes are assessed for foot ulceration and, if required, receive regular review and management from a team specialising in foot protection.



Introduction

Individuals with diabetes have increased risk of neuropathy and peripheral arterial disease (PAD), and more so when other associated risk factors (eg, smoking, hypertension and hypercholesterolemia) are present (Scottish Intercollegiate Guidelines Network [SIGN] 2010). Neuropathy and PAD are the main risk factors for development of ulcers, infection and lower limb amputation (Best Practice Advocacy Centre New Zealand 2010). However, neuropathy potentially is the leading risk factor for ulceration or amputation predominately because of unnoticed foot damage (Clayton et al 2009). It is important for individuals and health care professionals to be aware of the silent nature of neuropathy as more than 60% of ulcers are preceded by an episode of unnoticed foot damage or trauma (Clayton et al 2009). If PAD is also present, the risk of infection and amputation increases (American Diabetes Association 2003). Māori and Pacific Island people have higher risk of foot ulcer development progressing to lower limb amputation as type 2 diabetes in these populations occurs 10–20 years earlier than in other

populations (Grech et al nd). Foot ulcers affect a person's physical, emotional, and social wellbeing. As a result, these issues contribute to economic loss creating a huge public health burden (Rice et al 2014). Foot screening is effective for identification of risk for foot ulceration and complications (SIGN 2010).



Guidelines

Refer to **Scottish Intercollegiate Guidelines Network (SIGN 2010)** Management of Diabetes section 11 *Management of diabetic foot disease*. The document covers standards of care for risk stratification/triage, patient education, preventative footwear and orthoses, management of active foot disease, painful diabetic neuropathy, and a checklist for provision of information for individuals/carers in relation to foot disease in diabetes.

A tool (NZSSD – PodSIG 2014), such as the one recommended by SIGN, has been adapted for use in the NZ context by the New Zealand Society for Study of Diabetes (NZSSD) – Podiatry Special Interest Group (PodSIG) (2011) with permission of the Scottish Foot Action Group (SFAG). This tool acts as a national guide for developing integrated diabetes foot care pathways and to facilitate standardised access to care for people with diabetes related foot complications. This tool is being adopted by many District Health Boards (DHBs) and primary care podiatry programmes:

www.nzssd.org.nz/healthprofs/Primary%20diabetes%20foot%20screening%20and%20referral%20pathways%2005%2009%2013%20with%20intro.pdf

The **Best Practice Advocacy Centre New Zealand (BPAC)** (2010) *Screening and Management of 'The Diabetic Foot'* provides additional information for primary health care settings.

Additionally, the New Zealand Primary Care Handbook 2012, the Ministry of Health (2008) Diabetes and cardiovascular disease quality improvement plan and the Ministry of Health/DHB Allied health services podiatry for people with at risk/high risk feet Tier level three service specification (and Tier 1,2) provide further information.



Implementation advice

Refer to SIGN (2010) Management of Diabetes section 11 *Management of Diabetic Foot Disease*.

Access to foot care services is the basic expected care for people with diabetes.

Annual foot screening to ascertain risk is the basis of an integrated foot protection programme. SIGN suggests at least annual screening from diagnosis of diabetes is appropriate. Additionally they suggest foot screening data should be entered into an online screening tool to provide automatic risk stratification and a recommended management plan, including patient information. Refer to the Diabetes Foot Screening and Risk Stratification Tool developed by NZSSD – PodSIG (2014).

The **BPAC NZ (2010)** screening table suggests the following regarding the recommended frequency of examination for diabetic foot complications:

- confirmed diabetes – as soon as possible after diagnosis and annually thereafter
- first signs of foot problems identified or patient at high risk – every three to six months
- active ulceration and infection or very high risk – regular podiatry and multidisciplinary team assessment until active problems are resolved and then every one to three months.

A clear pathway of care should be in place from screening, through to general podiatry care and monitoring in the community, to accessing specialist podiatry care in the hospital setting. Wrap-around services including vascular, orthopaedic, nursing and allied health should be included in this pathway. Patients seen through an emergency department (ED) and or ward admissions with foot ulceration should have a referral to specialist podiatry services. Access can be via medical practices and/or community podiatry with patients being graded and referred as appropriate.

Funding should be in place for individuals to receive targeted foot care including:

- assessment and provision of services by a podiatrist on referral from a GP practice if a need is identified at an annual foot check (using screening tool)
- ongoing podiatry care and assessment where a need is identified by a podiatrist (access to Tier 3 service for active foot problems)
- access to ongoing podiatry care and assessment on discharge from Tier 3 service post active foot condition where deemed appropriate by the podiatrist
- access to footwear and offloading devices is important and needs to be timely.

Individuals identified with 'high risk' feet require ongoing access to funded podiatry services. Individuals who are identified as having 'high risk' feet via the screening tool need access to funded podiatry services on an ongoing basis, because as time progresses they often require more intensive input. Individuals with 'high risk' feet do not have isolated episodes of care, but require more intensive and lifelong management (Rice et al 2014).

All individuals with diabetes should receive written and oral advice about:

- how diabetes can affect feet
- why it is important to assess foot risk and regularly screen feet
- how to care for feet and when to seek help (SIGN 2010).

People with active foot disease should be referred to a MDT (Tier 3 service) – podiatrist, diabetes physician, orthotist, diabetes nurse specialist, vascular surgeon, orthopaedic surgeon, radiologist, wound specialist nurse, occupational therapist, etc.

Refer to the tool developed by NZSSD – PodSIG (2014). This paper also provides a good general overview of an in-depth foot assessment (Boulton et al 2008).

Refer to Ministry of Health DHB Allied health services podiatry for people with at risk/high risk feet tier level 3 service specification (and tiers 1 and 2).

Many referral processes are in place via Health Navigation tools available in medical practices.

Refer to SIGN (2010) section 11 *Management of diabetic foot disease*:
www.sign.ac.uk/pdf/sign116.pdf



Implementation examples / innovations



District Health Boards (DHBs)

Please refer to local clinical pathways.



Bay of Plenty District Health Board

Please refer to Bay Navigator.



Waitemata District Health Board

Waitemata DHB has implemented an integrated community podiatry service as an adjunct to the secondary MDT foot service for individuals with active foot complications. The initial implementation in Waitakere was associated with a marked decrease in amputations. This led to the implementation of the Save Our Soles community podiatry programme, which was district wide for all people that met the entry criteria domiciled in the WDHB catchment. Contact Waitemata DHB for more information.



Tairāwhiti District Health Board

Tairāwhiti DHB has a multidisciplinary team approach (podiatrist, diabetes CNS and wound care CNS, and the orthotics team and orthopaedic surgeon) aiming to reduce amputations. Midlands Health Network developed e-referral allowing GPs and practice nurses from primary care to refer directly to a community podiatrist or high risk foot clinic. The referral form is available online, accessed through TDH (Tairāwhiti District Health Board 2013).



Canterbury DHB

The Integrated Diabetes Services Development Group (IDSDG) and primary health organisations (PHOs) are implementing a diabetes high-risk podiatry programme that will establish a best practice model of care with equitable access across Canterbury. Contact CDHB for more information.



Assessment tools

Structure

Evidence of local arrangements to ensure that all people with diabetes receive initial screening of feet on diagnosis.

Process

Newly diagnosed people with diabetes receive initial screening of feet in accordance with national guidelines and locally agreed clinical pathways.

Numerator	The number of people in the denominator receiving an initial foot screen
Denominator	The number of people with diabetes

Outcome

A baseline record of the condition of the feet of an individual with diabetes is established in order to:

- a) highlight potential issues of foot deformation and loss of sensation that may lead to ulceration
- b) provide comparison with ongoing monitoring.

Structure

Evidence of local arrangements to ensure that all people with diabetes receive ongoing monitoring in accordance with national guidelines and locally agreed clinical pathways.

Process

Individuals already diagnosed with diabetes receive ongoing monitoring of feet in accordance with national guidelines and locally agreed clinical pathways

Numerator	The number of people in the denominator receiving ongoing monitoring of feet
Denominator	The number of people currently diagnosed with diabetes

Outcome

Reduction of incidence of foot trauma, deformation and ulceration leading to development of high risk feet.

Structure

Evidence of local arrangements to ensure that people with diabetes at risk of foot ulceration receive regular review by a foot protection team in accordance with national guidelines and locally agreed clinical pathways.

Process

The proportion of people with diabetes at risk of foot ulceration who receive regular review by a foot protection team in accordance with national guidelines and locally agreed clinical pathways.

Numerator	The number of people in the denominator who receive regular review by a foot protection team in accordance with national guidelines and locally agreed clinical pathways
Denominator	The number of people with diabetes at risk of foot ulceration

Outcomes

- Reduced incidence of foot ulceration.
- Lower rates of lower limb amputation.

Structure

Evidence of local arrangements to ensure that people with diabetes with a foot problem requiring urgent medical attention are treated by a multidisciplinary foot care team within recommended timeframes.

Process

- a) The proportion of people with diabetes with a foot problem requiring urgent medical attention referred to and treated by a multidisciplinary foot care team within recommended timeframes.

Numerator	The number of people in the denominator referred to and treated by a multidisciplinary foot care team within recommended timeframes
Denominator	The number of people with diabetes with a foot problem requiring urgent medical attention

- b) The proportion of people with diabetes with a foot problem requiring urgent medical attention referred to a multidisciplinary foot care team, who are treated in accordance with national guidelines and locally agreed pathways

Numerator	The number of people in the denominator treated in accordance with national guidelines and locally agreed clinical pathways
Denominator	The number of people with diabetes with a foot problem requiring urgent medical attention referred to a multidisciplinary foot care team

Outcome

Reduced rates of lower limb amputation.

NZSSD Diabetes Foot Screening and Risk Stratification Tool

www.nzssd.org.nz/healthprofs/Primary%20diabetes%20foot%20screening%20and%20referral%20pathways%2005%2009%2013%20with%20intro.pdf



Resources

Refer to **SIGN** (2010) section 11 *Management of Diabetic Foot Disease*.

NZSSD: Diabetes Foot Screening and Risk Stratification Tool

www.nzssd.org.nz/

Refer to the tool developed by NZSSD – PodSIG (2014). This paper also provides a good general overview of an in-depth foot assessment (Boulton et al 2008).

Health Navigator diabetes how to treat your feet page: www.healthnavigator.org.nz/health-topics/diabetes-foot-care/

Diabetes New Zealand Pamphlet on diabetes and how to care for your feet:

www.diabetes.org.nz/resources/pamphlets#Pamphlets

Diabetes New Zealand

www.diabetes.org.nz/about_diabetes/complications_of_diabetes/feet

Massachusetts Department of Public Health DM prevention and control programme feet brochure: <http://files.hria.org/files/DB707.pdf>

LEAP (lower extremity amputation prevention) www.hrsa.gov/hansensdisease/leap/

Five step LEAP programme:

1. Annual foot screening
2. Patient education
3. Daily self-inspection
4. Footwear selection
5. Management of simple foot problems

Foot care for a lifetime brochure HRSA

US Department of Health and Human Services Health Resources and Services Administration Health care Systems Bureau National Hansen's Disease Programs:
www.hrsa.gov/hansensdisease/leap/footcareforalifetime.pdf

National Institute for Health and Care Excellence (NICE)

In hospital care of foot pathway information for patients

Inpatient management of diabetic foot problems: www.nice.org.uk/guidance/cg119

Type 2 diabetes foot problems: Prevention and management of foot problems:

www.nice.org.uk/guidance/cg10

Assessment of feet using the *Touch the toes test* can be undertaken in an individual's own home by a member of their family/whānau, but is not a substitute for annual review by an appropriate health care professional (Rayman et al 2011). There is a video or full instructions (pdf) available on the Diabetes UK website (Diabetes UK 2012).



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Standard 12

People with diabetes with serious or progressive complications should have timely access to expert/specialist help.

Key practice points

- Determining the level of risk for macrovascular and microvascular complications is a key component of treatment planning and target setting for each individual.
- People with diabetes with severe complications are high-risk, especially if these are progressive and should be managed appropriately through specialist services.
- Adequate service provision across the range of subspecialty services is essential to ensure people receive the care that is required, within appropriate timeframes and by those with the right level of expertise.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that diabetes services recall, review and follow-up people with serious or progressive complications and ensure they have timely access to expert/specialist help.

Health care professionals ensure they are competent to assess people with diabetes for the risk and presence of associated complications and manage and refer them appropriately.

Planners and funders ensure they commission services that assess for the risk and presence of complications associated with diabetes and ensure people with diabetes have timely access to expert/specialist help.

People with diabetes with serious or progressive complications receive expert/specialist care.



Introduction

People with diabetes are at increased risk of developing microvascular and macrovascular complications (see Standards 9, 10, and 11). Appropriate screening for the detection of complications is important to ensure the right management occurs. The majority of this care can be provided in primary care but there will be circumstances where the person will require expert/specialist help and advice. This may be episodic or ongoing.

Due to the poly pathological nature of diabetes and the subsequent polypharmacy, the impact of diabetes complications and their management can be wide-ranging across all body systems.

The following list is provided to illustrate this; however, it is not exhaustive:

- hyperglycaemia (leading to diabetic ketoacidosis or hyperosmolar, hyperglycaemic nonketotic syndrome)
- hypoglycaemia – mild and severe and hypoglycaemia unawareness
- obesity and related health issues
- fatty liver
- skin and musculoskeletal disorders such as: adhesive capsulitis, carpal tunnel syndrome
- macrovascular disease such as: hypertension, dyslipidaemia, cerebrovascular, peripheral vascular, peripheral ulcers
- microvascular disease such as: nephropathy, retinopathy, maculopathy, cataracts and glaucoma, periodontal disease, neuropathy
- autonomic neuropathies such as: postural hypotension, gastroparesis, gustatory sweating, neurogenic bladder, sexual dysfunction, hypoglycaemia unawareness
- peripheral neuropathy leading to pain management, neuropathic ulcers, Charcot foot.

Co-existing conditions, such as:

- obstructive sleep apnoea
- gout
- polycystic ovary syndrome
- gastro-oesophageal reflux
- depression/anxiety/distress
- coeliac disease
- primary hypothyroidism
- pernicious anaemia
- anaemia of chronic disease
- Addison's disease.

Conditions or their treatments commonly contributing to hyperglycaemia, such as:

- chronic obstructive pulmonary disease and asthma
- cancer, cystic fibrosis
- Cushing's syndrome
- pancreatitis
- hemochromatosis.



Guidelines

The **New Zealand Primary Care Handbook 2012** details the process for identification of patients at high risk of diabetes-related complications (www.health.govt.nz/system/files/documents/publications/nz-primary-care-handbook-2012.pdf).

Determining level of risk for macrovascular and microvascular complications is a key component of treatment planning and target setting for each individual with type 2 diabetes:

- the risk of complications varies greatly across the diabetic population
- the aim is prevention of complications, especially targeting those at high risk
- patients with existing complications (eg, foot, eye, kidney or cardiovascular disease) are in a high-risk category and should be managed intensively.

Detailed advice is provided in figures 2 and 3 (pages 50 and 51) in the New Zealand Primary Care Handbook 2012.

Refer to national guidelines and local clinical pathways for guidance on criteria and timing for referral for specialist services and ongoing care, specific to the relevant complication.



Implementation advice

People with diabetes who have advancing, advanced and/or severe complications most commonly require access to specialist expertise. Adequate service provision across the range of subspecialty services is essential to ensure people receive the care that is required, within appropriate timeframes and by those with the right level of expertise.

Workforce recommendations for specialist services are articulated in the Introduction to the Toolkit. Local decisions about how service provision for these high-risk population groups occurs should be determined via clinical governance groups with the relevant clinicians, consumers and managers present.

As described in Standard 3, care-planning consultations should be available to all people with diabetes and should reflect the information and technical and emotional support needed to enable the person with diabetes to make the best decisions about their care (Diabetes UK et al 2008; National Institute for Health and Care Excellence [NICE] 2011). The person with diabetes is more likely to undertake action if it is related to decisions they have made, rather than decisions made for them (Diabetes UK et al 2008).

People with diabetes need to be orientated to the care planning approach and what to expect. Health professionals should undertake further training in developing patient-centred interventions if required (Scottish Intercollegiate Guidelines Network 2010). If the patient agrees, families/whānau and carers should have the opportunity to be involved in decisions about treatment and care and given the information and support they need (NICE 2009).

At each care planning consultation, time should be allowed to share information about issues and concerns; share results of biomedical tests; discuss the experience of living with diabetes; and address the management of obesity, food and physical activity. The person with diabetes should receive help to access support and services and agree to a plan for managing diabetes that incorporates individual priorities and goals. These should be jointly agreed, including setting a goal for HbA1c. Specific actions are in response to identified priorities that include an agreed timescale (Diabetes UK et al 2008; Joint Department of Health and Diabetes UK Care Planning Working Group 2006; NICE 2011).



Implementation examples / innovations

Refer to Standards 9, 10, and 11.



Assessment tools

Structure

Evidence of local arrangements to ensure that people with diabetes with serious or progressive complications have timely access to expert/specialist help.

Process

- (a) The proportion of people with diabetes with serious or progressive complications recalled for regular assessment within the past 12 months.

Numerator	The number of people in the denominator recalled for assessment within the past 12 months
Denominator	The number of people with diabetes with serious or progressive complications

- (b) The proportion of people with serious or progressive complications referred to specialist services for management advice (this may be face-to-face or virtual).

Numerator	The number of people in the denominator referred to specialist services for assessment and management advice within the past 12 months
Denominator	The number of people with diabetes with serious or progressive complications

See also:

- high risk foot (see Standards 11 and 12)
- renal disease (see Standard 10)
- eye disease (see Standard 9).



Resources

A number of helpful articles and practice guides can be found on the **Best Practice Advocacy Centre** (BPAC) site:

- Improving glycaemic control in people with type 2 diabetes: Expanding the primary care toolbox (www.bpac.org.nz/BPJ/2013/June/docs/BPJ53pages6-15.pdf)
- Monitoring people with diabetes over the age of 75 (http://bpac.org.nz/Report/2012/docs/bpac_2012_diabetes_monitoring.pdf)
- Initiating insulin in people with type 2 diabetes (http://bpac.org.nz/BPJ/2012/february/docs/bpj_42_insulin_pages_20-27.pdf)
- Screening and management of the diabetic foot (www.bpac.org.nz/BPJ/2010/october/docs/BPJ_31_diabeticfoot_pages_34-46.pdf)
- Assessing diabetic peripheral neuropathy in primary care (www.bpac.org.nz/BPJ/2014/june/docs/BPJ61-diabetic-peripheral-neuropathy.pdf)
- Screening for diabetic retinopathy in primary care (<http://bpac.org.nz/BPJ/2010/August/retinopathy.aspx>)



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While in hospital



Standard 13

People with diabetes admitted to hospital for any reason should be cared for by appropriately trained staff, and provided access to an expert diabetes team when necessary. They should be given the choice of self-monitoring and encouraged to manage their own insulin whenever clinically appropriate.

Key practice points

- The literature clearly demonstrates cost savings and a reduced length of stay for inpatients with diabetes who had access to a diabetes specialist inpatient service.
- All hospitals should have a dedicated diabetes inpatient specialist nurse service at a minimum level 1.0 full-time equivalent per 300 beds (adjusted for local diabetes prevalence).
- Increased costs associated with resourcing inpatient specialist teams are offset by cost savings seen in reduced lengths of stay and reduced rates of complications.
- Clear guidelines should be in place to indicate when a specialist inpatient team should become involved in the person with diabetes' care.
- People with diabetes who can demonstrate their ability to manage their diabetes while in hospital should resume self-management as soon as possible.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure adequate staff training in diabetes care and access to a specialist diabetes team where required to ensure people with diabetes admitted to hospital are cared for by appropriately trained staff, provided with access to a specialist diabetes team, and given the choice of self-monitoring and managing their own insulin.

Health care professionals ensure they are skilled and appropriately trained to care for people with diabetes and have access to a specialist diabetes team, and ensure that people with diabetes have the choice of self-monitoring and managing their own insulin.

Planners and funders ensure they commission and adequately resource secondary care diabetes services at a level according to national specifications, to provide a consultative service in the inpatient setting. They should also support adequate staff education programmes to ensure people with diabetes admitted to hospital are cared for by appropriately trained staff.

People with diabetes who are admitted to hospital are cared for by trained staff, including a specialist diabetes team if needed, and are given the choice of self-monitoring their blood glucose levels and, for those on insulin therapy, managing their own insulin.

Definitions

Appropriately trained staff: those with specific competencies in caring for people with diabetes (National Institute for Health and Care Excellence 2011).

Expert diabetes team

Specialist diabetes teams will be multidisciplinary, usually comprising physicians, nurses, podiatrists, dietitians, pharmacists and clinical psychologists, all of whom should have received extensive training accredited at a national level. The roles of specialist diabetes teams include direct delivery of clinical outpatient and inpatient care, leadership and coordination across whole system diabetes care, provision of education and training, and research and innovation (Goenka et al 2011, p 1495).

Clinical appropriateness to self-monitor and manage own insulin

People with diabetes admitted to hospital should be given the choice of self-monitoring and managing their own insulin as appropriate to the person with diabetes. Patients who are alert and demonstrate accurate insulin self-administration and glucose monitoring should be allowed to self-manage insulin as an adjunct to standard nurse-delivered diabetes management (Riethof et al 2012).



Introduction

The Quality Improvement Plan (Ministry of Health 2008) identified that people with diabetes tend to have more hospital admissions, stay longer and are more likely to be readmitted than those without diabetes. Inpatient costs for diabetes are high. For example, in the 2005/06 financial year there were 778 hospital admissions for diabetic ketoacidosis (DKA), which cost over \$2 million. DKA admissions had increased by 25% over the five previous years (Diabetes Care Workforce Service Review Team 2011).

Patients with diabetes comorbidities and complications should have access to teams of multidisciplinary experts in diabetes. In the real world, however, teams are rare. An individual nurse or outpatient nurse specialist is often the only resource, and the contribution of the inpatient diabetes nurse to patient management and quality assurance has not been universally appreciated. A good system of care, including patient assessment and education, can be maintained through multidisciplinary cooperation, inpatient diabetes resources, and common goals. Tools and supporting education can be and have been the responsibility of dedicated inpatient diabetes nurses and dietician specialists. Care pathways, standardised assessment tools, and readily available teaching materials can provide guidance in practice (Nettles 2005).

There are three general hospital models to diabetes management:

1. A consultant approach, where the specialised diabetes services are invited by the admitting team to assist with the specific patient's diabetes management.
2. A systematic hospital-wide diabetes programme that improves the identification of inpatients with diabetes and enhances the diabetes management skills of all staff through education and implementation of guidelines. The responsibility of managing the inpatient with diabetes remains with the admitting team.

3. Through a multidisciplinary team approach, with the role of the inpatient diabetes team varying from an advisory role to active management of the patient's diabetes for all people with diabetes, and commences at the time of the patient's admission.

The third model has been shown to reduce the average length of stay and medical costs following intervention by an inpatient diabetes management team that primarily involves a specialist diabetes nurse (Australian Diabetes Society 2012).

The UK Diabetes Inpatient audit revealed people with diabetes did not receive timely input from a diabetes specialist team and only 54.4% of inpatients with diabetes were seen by an expert team that should have been seen (National Health Service [NHS] 2011). The National Inpatient Diabetes Audit (NaDIA) examines data about inpatients with diabetes collected by hospital teams in England and Wales on a nominated day in a defined week in September. It covers issues such as staffing levels, medication errors, patient harm and patient experience. The 2013 audit involved 14,198 patients with diabetes in 142 trusts in England and six local health boards in Wales. In 2014 the repeated audit shows large gaps in care remain:

- Over a fifth (22.0%) of patients with diabetes in hospital would have experienced a largely avoidable hypoglycaemic episode in hospital within the previous seven days.
- One in 10 (9.3%) would have experienced a severe hypoglycaemic episode.
- One in 50 (2.2%) required injectable treatment due to the severity of the hypoglycaemia.
- This is despite the fact that only 8.1% of respondents had been admitted for their diabetes or a diabetic complication.
- More than a third (37.0%) of patients with diabetes experienced a medication error, down from 39.9% in 2011.
- Patients who had experienced a medication error were more than twice as likely to suffer a severe hypoglycaemic episode (15.3%) compared to those with no error in their medication (6.8%).

For more information: www.hscic.gov.uk/4806.

As well as providing expert clinical input to the care of people with diabetes whilst in hospital, clinical nurse specialists should be available for the education of general nurses and medical staff (Brooks et al 2013). Delayed involvement of specialist diabetes services, along with inappropriate diabetes management and poor blood glucose control are factors that all contribute to increased lengths of stay and poorer outcomes for the inpatient with diabetes (Australian Diabetes Society 2012).

The literature clearly demonstrates cost savings and reduced lengths of stay for inpatients with diabetes who had access to diabetes specialist inpatient service versus no access or traditional models of care (Australian Diabetes Society 2012; Davies et al 2001). The diabetes specialist team can play a pivotal role through teaching, training and support, to ensure that other members of staff are able to facilitate the pathway. Any increased costs associated with resourcing specialist teams to provide inpatient care, are offset by the savings through reduced lengths of stay, reduced rates of complications and overall reduced health care costs associated with inpatient care (Kerr 2011; NHS 2011).

A dedicated inpatient diabetes team raises the quality of care for patients, enhances patient and professional education and lowers the incidence of prescription and management errors (Brooks et al 2011). Pharmacist input prior to discharge improves adherence to medications (Shah et al 2013).

Resulting conclusions drawn from preliminary analysis of data from the Diabetes InPatient Length of Stay (DipLoS) study undertaken in three New Zealand District Health Boards (Auckland, MidCentral Health and Lakes) found the following:

- Diabetes in patients admitted to hospital is even more common than recognised previously.
- The Virtual Diabetes Register is far more complete, sensitive and accurate than previous admission coding for diabetes.
- There is a major unmet need for inpatient advice, at least in Mid-Central and Auckland. The interventions were perceived as excellent but unsustainable by the nursing teams.
- Diabetes is associated with (but not necessarily causative of) increased lengths of stay.
- Delay in initial referral to diabetes teams is potentially a major cause of delay in discharge.
- Simple prioritisation of inpatient work is ineffective.
- Automated referral methods, without waiting for manual referrals, are effective in reducing delays in seeing patients and may prove effective in reducing the length of stay (Drury 2011).

Self-management in the inpatient setting

The diabetes inpatient satisfaction (DIPSat) study demonstrated hyperglycaemia and hypoglycaemia episodes were often linked to timing of insulin and meals. Self-administration of insulin and time spent with a diabetes specialist nurse was associated with higher treatment satisfaction (Rutter et al 2013). Up to 40% of people with diabetes who wanted to were unable to monitor and manage their insulin while in hospital (NHS 2011).

People with diabetes using multiple daily injections or insulin pump therapy, who can demonstrate their competence at self-management, can be treated in the hospital under defined conditions with continuation of their usual programme of self-management. This is utilising the skills of advanced carbohydrate counting to permit the matching of mealtime insulin bolus doses to carbohydrate intake, and the use of a rule for the establishment of correctional doses for treatment of hyperglycaemia (Braithwaite et al, 2007).



Guidelines

Appropriately trained staff

According to the Health Workforce New Zealand 'Diabetes workforce service review' (Health Workforce New Zealand 2011):

Nursing staff

All nurses deliver care to people with diabetes. This National Diabetes Nursing Knowledge and Skills Framework (NDNKSF) has been developed to assist all registered nurses to demonstrate that they are adequately prepared to provide the required care and education for the person with diabetes and related comorbidities, whatever their practice setting. To promote best practice the NDNKSF is linked to national guidelines, standards of practice and the Nursing Council of New Zealand's competencies for registration:

www.nzssd.org.nz/documents/dnss/National%20Diabetes%20Nursing%20Knowledge%20and%20Skills%20Framework%202009.pdf.

Dietitians

Implementation of an integrated knowledge, skills and career framework for New Zealand dietitians is planned: www.health.govt.nz/system/files/documents/pages/diabetes-workforce-service-review.pdf.

Expert diabetes teams

- The Australian Diabetes Society (2012) indicates an expert team comprises of diabetes inpatient specialist nurses led by a consultant in diabetes.
- The role of the specialist diabetes inpatient team includes:
 - improving diabetes management expertise throughout the hospital
 - development and implementation of specific diabetes management protocols
 - direct management of diabetes with specific referral criteria
 - ward liaison, troubleshooting, management advice
 - discharge planning.
- Clear guidelines should indicate when the diabetes specialist team should become involved (early involvement = reduced length of stay [LoS]), consider referral.
- All hospitals should implement a diabetes inpatient specialist nurse service of 1.0 whole-time equivalent per 300 beds (reduces LoS whatever the reason for admission).
- Inpatient education by the diabetes inpatient specialist nurse, with the support of generalist nurses, can provide education improving discharge outcomes and achieving earlier discharge (Dhatariya et al 2012).

Guidelines for referral to inpatient specialist diabetes teams

Royal Cornwall Hospitals have the following guidelines for referral to the inpatient specialist nurse team.

Priority referral

- Diabetic ketoacidosis (DKA)/hyperosmolar hyperglycaemic state (HHS).
- Patients who are receiving IV Sliding Scale Infusion.
- New type 1 diabetes mellitus.
- Patients requiring emergency Insulin start.
- Profound/prolonged hypoglycaemia or patients admitted with primary cause of admission as hypoglycaemia.
- Acute diabetes foot problems.

Routine referral

- New/existing type 2 diabetes mellitus commencing insulin/sulphonylurea.
- Enteral/ parental feeding regimens.
- Recurrent hypoglycaemia.
- Advice pre procedures ie, bowel prep, day case surgery.
- Declining glycaemic control (blood glucose level <4 mmol/l or >12 mmol/l) where primary intervention and medical review has been unsuccessful.

Consider referral

- Newly diagnosed type 2 diabetes on diet or starting Metformin.
- Multiple complications of diabetes.
- Education/equipment advice.
- Patients undergoing bariatric surgery.

The full guidelines can be found here:

www.rcht.nhs.uk/DocumentsLibrary/RoyalCornwallHospitalsTrust/Clinical/EndocrineAndDiabetes/DiabetesInPatientSpecialistNurseReferralCriertiaDISN.pdf

Inpatient management

The National Institute for Health and Care Excellence (NICE) Guideline CG15 Type 1 diabetes: Diagnosis and management of type 1 diabetes in children, young people and adults has specific guidance for management in the inpatient setting (refer section 1.12.3):

www.nice.org.uk/guidance/cg15/resources/guidance-type-1-diabetes-pdf

Diabetes Inpatient Management American Association of Diabetes Educators (AADE) Position Statement:

www.diabeteseducator.org/export/sites/aade/_resources/pdf/general/Inpatient_PS_2011.pdf

Self-management in hospital

Joint British Diabetes Societies for Inpatient Care Group provide the following guideline on self-management in hospital:

http://diabetologistsabcd.org.uk/JBDS/JBDS_IP_SelfManagement.pdf



Implementation advice

The **New Zealand Society for the Study of Diabetes** (NZSSD) identifies the following points in their consensus statement on their 'Inpatient Consensus Statement' (2013):

Every person with diabetes who is hospitalised has the right to:

- receive optimum diabetes care based on 'best practice'
- have a hospital stay free from harm (especially insulin, medication and food errors) and not inappropriately prolonged as a result of their diabetes management
- have access to specialist diabetes advice/care
- where practically possible, be actively involved in their own diabetes management during their hospital stay
- diabetes care following discharge from hospital that is timely, appropriate and well-informed (www.nzssd.org.nz/documents/misc/13%2007%20NZSSD%20Inpatient%20Consensus%20Statement%20-%20Final%20overion.pdf).

The role of the expert diabetes team should include:

- improving diabetes management expertise throughout the hospital
- development and implementation of specific diabetes management protocols
- direct management of diabetes with clear referral criteria
- ward liaison, troubleshooting, management advice and discharge planning
- a diabetes inpatient specialist service of at least 1.0 whole-time equivalent per 300 beds (Australian Diabetes Society 2012).

The **Diabetes Care** article Pathways to Quality Inpatient Management of Hyperglycemia and Diabetes: A Call to Action provides detailed advice on the implementation of inpatient care: <http://care.diabetesjournals.org/content/36/7/1807.full.pdf+html>.

Self-monitoring and managing own insulin

The Joint British Diabetes Societies for Inpatient Care Group (2012) provide recommendations on how to implement self-management in hospital, including pump therapy.

Key points include the following:

- Allow patients to self-manage their diabetes as soon as possible, where appropriate.
- The ability of the patient or carer to manage the diabetes should be taken into consideration. Discuss with the diabetes specialist team if necessary.
- Prescribe and administer insulin in line with local policies and guidelines, in consultation with the patient wherever possible.
- Involve the diabetes specialist team if diabetes-related delays in discharge are anticipated.
- Provide patient education to ensure safe management of diabetes on discharge.
- Discharge should not be delayed solely because of poor glucose control but appropriate transfer of care and follow-up should occur.
- Systems should be in place to ensure effective communication with community teams, particularly if changes to the patients' preoperative diabetes treatment have been made during the hospital stay.
- Diabetes expertise should be available to support safe discharge and the team that normally looks after the patient's diabetes should be contactable by telephone (www.leicestershirediabetes.org.uk/uploads/123/documents/NHS%20Diabetes%20selfmgt%20of%20diabetes%20in%20hospital.pdf).

The recent American Diabetes Association technical review also refers to inpatient self-management of diabetes. To implement the recommendations proposed therein, patients would have to be well-informed before admission and not in need of basic education. According to Nettles (2005), the technical review's recommended components for safe inpatient self-management include:

- demonstration that the patient can accurately self-administer insulin
- confirmation that the patient is alert and able to make appropriate decisions about insulin doses
- recording in the medical record of all insulin administered by both the patient and nurses
- physician-written order that the patient may perform insulin self-management while hospitalised.

In addition, Dhatariya et al (2012) recommend the following:

- Patients should be assessed as alert and competent at insulin delivery and blood glucose monitoring, ie, not affected by medication or acute illness.
- Treatment requirements may differ from usual in the immediate post-operative period where there is a risk of glycaemic instability and clinical staff may need to make decisions about diabetes management.
- The diabetes specialist team should be consulted if there is uncertainty about treatment selection or if the blood glucose targets are not achieved and maintained.
- Guidelines should be in place to ensure that the ward staff know when to call for specialist help.
- Involve the diabetes specialist team if blood glucose targets are not achieved and maintained.
- Staff skilled in diabetes management should supervise surgical wards routinely and regularly.

Where there are disagreements between patients and ward staff in regards to the level of self-management, the diabetes inpatient specialist team should be available to support the decision (Joint British Diabetes Societies for Inpatient Care Group 2012).



Implementation examples / innovations



Reducing length of stay and improving quality of care for inpatients with diabetes (DIPLoS)

Three parallel prospective controlled studies examined three different process models of delivering inpatient care in Auckland, Lakes and Mid Central Health. Each ran over three consecutive periods: A baseline run-in phase (two months), the intervention period (four months), a return to baseline run-out phase (two months). Data have also been collected from two additional non-intervention sites (Waikato and Wellington) to control for external/seasonal factors.

The REACTIVE model (Lakes) followed the current usual pattern of ward-initiated referrals with subsequent intervention as above but, for the intervention period, prioritised this activity above other routine tasks with little change in overall inpatient staffing.

The PROACTIVE intervention (MidCentral) employed daily (weekday) ward visits/phone calls and electronic notification seeking to identify a person with diabetes early during an admission. Nursing intervention was then promptly arranged to optimise care and minimise length of stay. This method used increased dedicated nurse inpatient staffing for the period of the study.

In the ELECTRONIC group (Auckland), all admissions of people with known diabetes from previous admission ICD-10 coding were notified by email to the diabetes inpatient team. Central triaging then prioritised patients to arrange intervention as above where needed, but with no change in inpatient staffing.

Headline results included:

- the REACTIVE intervention produced no significant change in time to ward visit or length of stay
- the PROACTIVE method led to an approximate doubling in the number of patients seen but no significant changes in time to ward visit or length of stay
- the ELECTRONIC method led to a 35% increase in patients seen, a >50% reduction in time to ward visit (3.9 to 1.8 days; $p < 0.001$) and an apparent 30% reduction in length of stay (8.6 to 5.9 days; $p < 0.005$). Part of the LoS change could potentially be an artefact caused by earlier visits and further analyses are under way to address this (Drury 2011).



Inpatient Diabetes Specialist Nurses

In the study by Flanagan et al (2008), establishing a team of five diabetes specialist nurses, supported by a consultant and specialist registrar significantly reduced LoS or medical admissions of people with diabetes. Supporting staff also included a link nurse responsible for diabetes on every ward and each individual with a diagnosis of diabetes was identified on admission. The overall length of stay was reduced. The team made daily ward visits to identify people with diabetes and provide advice about blood glucose control throughout their stay in hospital. Flanagan et al (2008) go further to suggest inpatients who are able to manage their own insulin should be encouraged to do so, as they often have a better understanding of their own care requirements.



Insulin safety and reducing errors

Waitemata DHB recognised a problem with insulin errors and developed processes involving hospital pharmacists to reduce errors. The model was presented at the NZSSD Annual Scientific Meeting in 2012 and is summarised on the HIIRC site as follows:

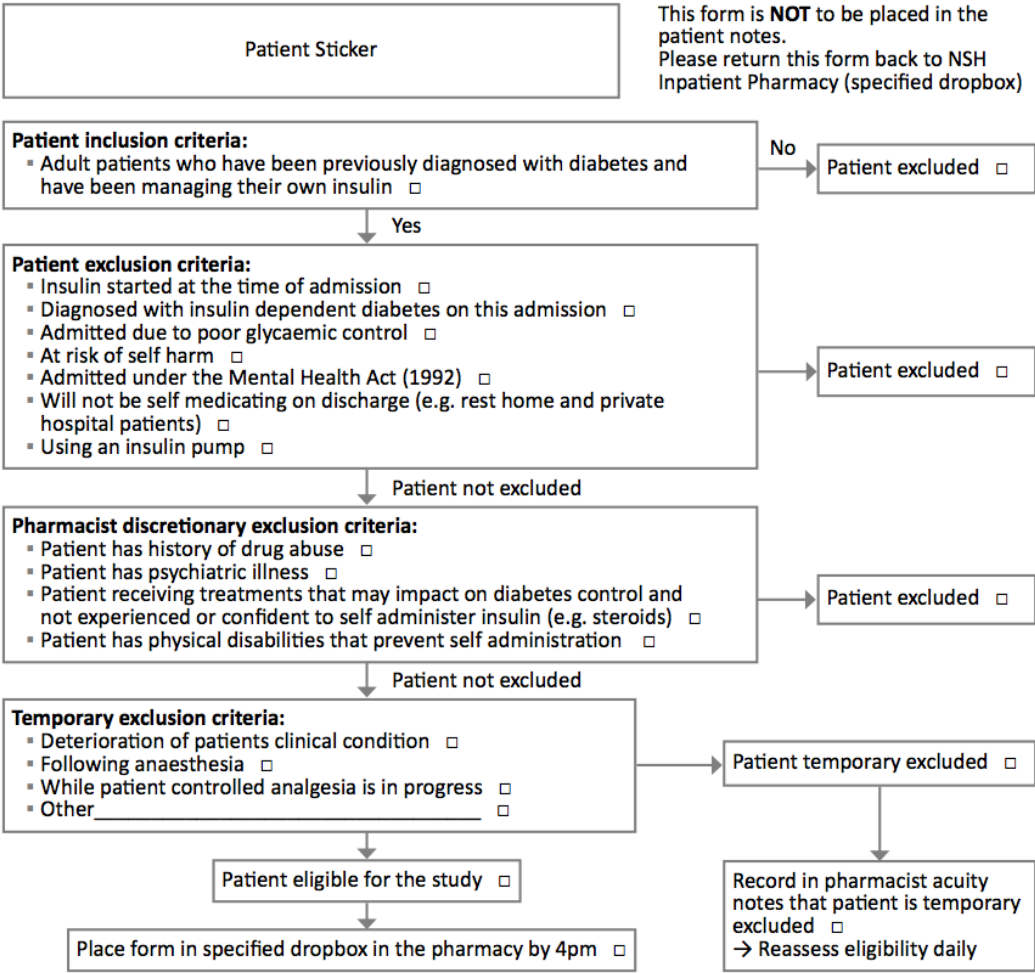
‘Unfamiliarity with new insulin preparations and ‘mixes’ among hospital staff, together with insulin timing errors, food delays and inaccurate drug history, have caused a number of insulin prescribing and administration errors in hospital wards. This clinical governance issue has prompted the diabetes team at Waitemata District Health Board with the help of pharmacy to raise awareness about different insulin preparations and also conduct a review of insulin errors and concerns during 2009. Pharmacists record all medication errors on a database. The number of errors recorded is dependent on the level of pharmacist participation on post-acute ward rounds. The authors analysed the insulin errors recorded from January 2009 to January 2010, relating to prescribing, administering and documentation.

They felt that the errors analysed reflect the majority of events. Seven cases were identified where patients were given Humalog instead of a Humalog Mix (25 or 50), and one when a patient was given Humalog instead of Humulin 30/70. Most of them were recognised early with adverse events prevented, though in 2 cases significant hypoglycaemia occurred. Common insulin errors included: insulin not being charted when known to be on insulin, errors of dose and timing, GIK transfer errors (stopping the GIK without usual/new regimen being charted), and omission of insulin from discharge scripts.

The authors conclude that enhanced awareness about different insulins including Humalog Mix insulins, accurate medicine reconciliation at admissions and greater involvement of the diabetes team should improve patient safety where insulin prescription and administration is concerned. In view of the shortage of diabetes nurse specialists, they see the hospital pharmacists as an important resource to reduce insulin errors. Many diabetes patients themselves may be able to manage their insulin better than hospital staff. They go on to say that a repeat review by the pharmacy after six months will hopefully demonstrate a positive impact of updated educational resources and information.’ (www.hiirc.org.nz/page/20624/insulin-errors-in-a-hospital-setting-abstract/?q=McNamara&highlight=mcnamara§ion=10538).

This included devising a new chart for use in the inpatient setting to determine eligibility for self-administering insulin. A revised version is in development.

Self-administration of insulin in the management of diabetes in hospital
Phase 3: Patient Assessment Form: Flow Chart of eligibility to self-administer insulin





ThinkGlucose

ThinkGlucose is designed to improve the care of people with diabetes when they are admitted to hospital. Patients with a secondary diagnosis of diabetes who receive the right care for their diabetes are able to return home fitter, more safely and with a positive patient experience (NHS 2013, p 2).

ThinkGlucose provides a structured development programme for developing and improving the care of people with diabetes who are admitted to hospital. It brings together hospital diabetes specialist teams with colleagues in patient safety, clinical governance, and commissioning, surgical and medical specialties across the hospital to deliver improved effective efficient and patient friendly care to people with diabetes. The programme aims to:

- increase the awareness of diabetes in inpatients and educate staff
- introduce early specialist involvement with an early discharge/follow-up plan to reduce the average length of stay
- reduce prescription errors and improve patient care through publicising updated guidelines from local and national guideline producers, for example NICE.

The ThinkGlucose safe use of insulin tool provides education materials and guidance on managing self-administration, which reinforces the importance of self-administration if the patient has the appropriate skills and capabilities (p 2).

ThinkGlucose provides a comprehensive package of service improvement, leading to a clinical pathway that will help to ensure that all staff are better equipped to care for inpatients with diabetes. By improving staff knowledge, patient assessment, management of patient medication and meals, patients will have fewer complications, get better quicker and be discharged earlier (NHS 2013, p 3). Quality outcomes delivered include the significant improvements seen within the impact on quality of care or population health. For example, in York Teaching Hospital NHS Foundation Trust, provision of electronic monitoring of glucose control led to efficient warning of poor glucose control allowing for responsive management of diabetes, including medication and food review, and an increased awareness of diabetes.

ThinkGlucose also improved patient safety achieved through face-to-face and e-learning training for health professionals involved in diabetes prescribing. This resulted in reduced insulin prescription errors from 24.6% (before) to 6.4% (after) in the Dudley Group of Hospitals NHS Trust. The improvement on patients and carer experience are demonstrated through reduced length of stay in hospital.

Comprehensive information can be found here:

www.institute.nhs.uk/quality_and_value/think_glucose/welcome_to_the_website_for_thinkglucose.html



Can an inter-professional education tool improve health care professional confidence, knowledge and quality of inpatient diabetes care?

This was a pilot study (Herring et al 2013) to evaluate an interprofessional education tool designed to improve health care professional confidence, knowledge and quality of inpatient diabetes care. Diabetes specialists designed an education tool for use in the hospital environment to educate qualified pharmacists, nurses, health care assistants and junior doctors. The interprofessional learning enabled professionals to learn from and about each other. The education tool was piloted at four hospitals. Diabetes specialists delivered the education programme to 31 health care professionals over eight hours either as three individual teaching blocks or a whole day. Health care professionals completed a multiple choice questionnaire before and after the education intervention to evaluate acquisition of knowledge; confidence was evaluated using categorical questions, and diabetes specialists used a clinical audit form before and after the education programme to evaluate the quality of diabetes care.

Significant improvements were found in knowledge and confidence, reduction in management errors and improvement in appropriate blood glucose monitoring. Improvement in the number of appropriate diabetes referrals and reduction in prescribing errors did not reach statistical significance. They concluded the education tool improved health care professional confidence and knowledge and may improve the quality of inpatient diabetes care.



Skills for Health – Competencies for Diabetes

According to NICE recommendations, hospital services should have an adequate training programme and a process for monitoring the knowledge and skills of the workforce. ‘Skills for Health – competencies for diabetes’ is a framework that practitioners can be assessed against. The assessment should include appropriate competencies in diabetes-related devices, such as blood glucose monitoring meters, insulin pens and pumps (NHS 2011).



Assessment tools

Structure

Evidence of local arrangements ensuring all inpatients with diabetes are cared for by appropriately trained staff, provided access to an expert diabetes team, given the choice to self-monitor, and manage their own insulin (NICE 2011)

Process

- (a) The proportion of staff on inpatient wards who are appropriately trained to care for people with diabetes.

Numerator	The number of staff in the denominator appropriately trained in the care of people with diabetes
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Denominator	The number of staff on inpatient wards
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Outcome

Reduction in incidents relating to insulin causing harm.

- (b) The proportion of inpatients with diabetes who are provided with access to a specialist diabetes team

Numerator	The number of inpatients in the denominator provided with access to a specialist diabetes team
Denominator	The number of inpatients with diabetes

Outcome

Inpatient length of stay for people with diabetes is similar to people without diabetes.

- (c) The proportion of inpatients with diabetes on insulin therapy who are given the choice of self-monitoring and managing their own insulin

Numerator	The number of inpatients in the denominator given the choice of self-monitoring and managing their own insulin
Denominator	The number of inpatients with diabetes on insulin therapy

Outcome

Increase in patient satisfaction with their care in hospital.



Resources

Health Mentor Online – a self-directed online learning resource for nurses to complete Level 1 and 2 on the National Diabetes Nursing Knowledge and Skills Framework:
<http://pro.healthmentoronline.com/>

Consumer information is also provided: www.healthmentoronline.com



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Standard 14

People with diabetes admitted to hospital as a result of uncontrolled diabetes or with diabetic ketoacidosis should receive educational support before discharge and follow-up arranged by their GP and/or a specialist diabetes team.

Key practice points

- All hospitals should have a dedicated diabetes inpatient specialist nurse service at a minimum level of 1.0 whole-time equivalent per 300 beds (adjusted for diabetes prevalence).
- All hospitals should have an expert multidisciplinary diabetes team in place.
- Increased costs associated with resourcing inpatient specialist teams are offset by cost savings seen in reduced lengths of stay and reduced rates of complications.
- Clear guidelines should be in place to indicate when a specialist inpatient team should become involved in the person with diabetes' care.
- Education should include self-managing diabetes to prevent uncontrolled diabetes through effective self-monitoring, appropriate insulin dose adjusting, and sick day management.
- Access to structured education offered within three months of discharge for uncontrolled diabetes may reduce readmission rates.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure patients admitted to hospital with uncontrolled diabetes, diabetic ketoacidosis or hyperosmolar hyperglycaemic nonketotic syndrome receive educational support prior to discharge with follow-up after discharge by a specialist diabetes team.

Health care professionals ensure they know how to access a specialist diabetes team for all patients admitted to hospital with uncontrolled diabetes, diabetic ketoacidosis or hyperosmolar hyperglycaemic nonketotic syndrome that provides educational and support prior to discharge.

Planners and funders ensure they commission and adequately resource secondary services, at a level according to national specifications, to provide specialist care and appropriate follow-up for people with diabetes admitted for uncontrolled diabetes, diabetic ketoacidosis or hyperosmolar hyperglycaemic nonketotic syndrome.

People with diabetes admitted to hospital with uncontrolled diabetes, diabetic ketoacidosis or hyperosmolar hyperglycaemic nonketotic syndrome receive information and/or psychological support from a specialist diabetes team before and after they leave hospital.

Definitions

Uncontrolled diabetes

Glycaemic control not meeting targets or severe hyperglycaemia requiring hospital admission.

Diabetic ketoacidosis and hyperosmolar hyperglycaemic nonketotic syndrome (HHNS)

Diabetic ketoacidosis (DKA) is a life-threatening complication of type 1 diabetes that progresses rapidly and requires immediate medical attention (Mills and Stamper 2014). DKA consists of the biochemical triad of ketonaemia (ketosis), hyperglycaemia, and acidaemia (JBS 2013). HHNS is different from DKA in that there is marked hyperglycaemia without significant hyperketonaemia or acidosis. There is characteristic hypovolaemia, and hyperosmolarity and requires a different management approach to DKA (Joint British Diabetes Societies for Inpatient Care Group 2012).

Specialist diabetes team

‘Specialist diabetes teams will be multidisciplinary, usually comprising physicians, nurses, podiatrists, dietitians, pharmacists and clinical psychologists, all of whom should have received extensive training accredited at a national level. The roles of specialist diabetes teams include direct delivery of clinical outpatient and inpatient care, leadership and coordination across whole system diabetes care, provision of education and training, and research and innovation’ (Goenka et al 2011, p 1495).

Follow-up

Follow-up for people admitted to hospital with diabetic ketoacidosis should take place within 30 days of discharge by a specialist diabetes team (National Institute for Health and Care Excellence [NICE] 2011a).



Introduction

The **Joint British Societies for Inpatient Care Group** (JBSICG) (2013) has published a comprehensive guideline for the management of diabetic ketoacidosis. It highlights the need for diabetes expertise in the inpatient setting and states the following:

‘Diabetic ketoacidosis (DKA), though preventable, remains a frequent and life threatening complication of type 1 diabetes. Unfortunately, errors in its management are not uncommon and importantly are associated with significant morbidity and mortality. Most acute hospitals have guidelines for the management of DKA but it is not unusual to find these out of date and at variance to those of other hospitals. Even when specific hospital guidelines are available audits have shown that adherence to and indeed the use of these is variable among the admitting teams. These teams infrequently refer early to the diabetes specialist team and it is not uncommon for the most junior member of the admitting team, who is least likely to be aware of the hospital guidance, to be given responsibility for the initial management of this complex and challenging condition’ (p 6).

'Diabetic ketoacidosis is associated with increased mortality and morbidity. An improved understanding of the pathophysiology of DKA together with close monitoring and correction of electrolytes has resulted in a significant reduction in the overall mortality rate from this life-threatening condition. Mortality rates have fallen significantly in the last 20 years from 7.96% to 0.67%' (p 8).

According to the JBSICG, the diabetes specialist team must always be involved in the care of those admitted to hospital with uncontrolled diabetes and in the assessment of precipitating factors, management, discharge and follow-up (Mills et al 2014). Their involvement shortens patient stays and improves safety (Cavan et al 2001; Davies et al 2001; Leveta et al 1995 [Koproski et al 1997]), leads to intensification of treatment during in-hospital stay, and reduces readmissions and post-discharge HbA1c levels (Wei et al 2013).

For patients admitted with DKA or HHNS, review by the specialist diabetes team should occur within 24 hours of admission. For these patients and those admitted with uncontrolled diabetes, specialist diabetes team input is important to allow re-education, to reduce the chance of recurrence, and to facilitate appropriate follow-up. There is good evidence of improvement in care and of reduced readmissions, with use of diabetes inpatient specialist nurses; however, few New Zealand district health boards provide adequate dedicated diabetes nurse specialist inpatient diabetes services (Diabetes Care Workforce Service Review Team 2011).



Guidelines

Inpatient management

The NICE Guideline CG15 Type 1 diabetes: Diagnosis and management of type 1 diabetes in children, young people and adults has specific guidance for management of diabetic ketoacidosis inpatient setting (refer section 1.12.2): www.nice.org.uk/guidance/cg15/resources/guidance-type-1-diabetes-pdf.

The NICE 'Managing diabetic ketoacidosis' interactive pathway can be found here: <http://pathways.nice.org.uk/pathways/diabetes#path=view%3A/pathways/diabetes/managing-type-1-diabetes-in-adults.xml&content=view-node%3Anodes-managing-diabetic-ketoacidosis>

The Joint British Diabetes Societies Inpatient Care Group (2013) has the following guidelines for diabetic ketoacidosis in adults: http://diabetologists-abcd.org.uk/JBDS/JBDS_IP_DKA_Adults_Revised.pdf.

The Joint British Diabetes Societies Inpatient Care Group (2012) has the following guideline for the management of the hyperosmolar hyperglycaemic state (HHS) in adults with diabetes: www.diabetologists-abcd.org.uk/JBDS/JBDS_IP_HHS_Adults.pdf.

Craig et al (2011) for the Australian Type 1 Diabetes Expert Advisory Group: The Australian national evidence-based clinical care guidelines for type 1 diabetes in children, adolescents and adults suggest most DKA cases occur in people with an existing diagnosis of diabetes; therefore, they should be generally preventable through frequent monitoring of blood glucose levels, early detection of ketones and by adequate replacement of insulin. The guidelines recommend education of patients, health care professionals and the general public to reduce the frequency of hospitalisations for DKA. Improved follow-up care and access to timely medical advice will further reduce readmission rates.



Implementation advice

Uncontrolled diabetes should be recognised and appropriate management and follow-up arranged by a specialist diabetes team. In the majority of cases, people with uncontrolled diabetes should be managed in hospital by specialist care.

Diabetic ketoacidosis or hyperosmolar hyperglycaemic nonketotic syndrome is a recognised common medical emergency and must be treated appropriately. Review by the specialist diabetes team should occur within 24 hours of admission. Health economics must address this in the context of provision of expert medical and nursing input within secondary care.

The **New Zealand Society for the Study of Diabetes** (NZSSD) identifies the following points in their consensus statement on their Inpatient Consensus Statement (2013):

Every person with diabetes who is hospitalised has the right to:

- receive optimum diabetes care based on ‘best practice’
- have a hospital stay free from harm (especially insulin, medication and food errors) and not inappropriately prolonged as a result of their diabetes management
- have access to specialist diabetes advice/care
- where practically possible, be actively involved in their own diabetes management during their hospital stay
- diabetes care following discharge from hospital that is timely, appropriate and well-informed

(www.nzssd.org.nz/documents/misc/13%2007%20NZSSD%20Inpatient%20Consensus%20Statement%20-%20Final%20version.pdf).

Diabetes UK recommends that hospitals should:

- have a ‘clinical lead’ for the management of the adult patient admitted with uncontrolled diabetes, diabetic ketoacidosis or hyperosmolar hyperglycaemic nonketotic syndrome with responsibility for implementation of the hospital guidelines
- collect data about the outcomes for patients admitted with diabetic ketoacidosis or hyperosmolar hyperglycaemic nonketotic syndrome
- have the services of a dedicated Diabetes Inpatient Specialist Nurse (DISN) at staffing levels most recently recommended by Diabetes UK (1.0 full-time equivalent [FTE] per 300 beds) (NICE 2011b)
- have a Quality Assurance Scheme in place to ensure accuracy of blood glucose and ketone meters
- have a training programme in place for all health care staff expected to prescribe, prepare and administer insulin (eg, the safe use of insulin and the safe use of intravenous insulin e-learning packages from National Health Service [NHS] Improving Quality)
- ensure they commission a service providing access to a specialist diabetes team prior to a patient’s discharge with follow-up after discharge for all patients admitted to hospital with diabetic ketoacidosis, uncontrolled diabetes or hyperosmolar hyperglycaemic nonketotic syndrome (NICE 2011c).

Education should include:

- self-managing diabetes in order to prevent DKA or HHNS through effective self-monitoring and regular insulin doses according to need to prevent recurrence (Mills et al 2014)
- discussion of sick day advice
- assessment of the need for home ketone testing (blood or urinary) with education to enable this
- provision of contact telephone numbers for the diabetes specialist team and their primary health care providers.

People admitted to hospital with uncontrolled diabetes should be discharged with a written care plan: a process that allows the person with diabetes to have active involvement in deciding, agreeing and owning how their diabetes is managed (see Standard 3). This should be copied to the primary health care team who will be involved in ongoing follow-up. Further access to structured education (see Standard 1) offered within three months of discharge may decrease readmission rates further (Joint British Diabetes Societies for Inpatient Care Group 2013).

Regarding discharge planning:

- discharge planning should start at hospital admission and clear diabetes management instructions should be provided at discharge
- discharge summaries should be transmitted to the primary health care professional as soon as possible after emergency department attendance or discharge
- information on medication changes, pending tests and studies and follow-up needs should be communicated clearly to the primary health professional, particularly those with uncontrolled diabetes
- using a template for discharge summaries is helpful to ensure inclusion of relevant information.



Implementation examples / innovations



Diabetes Treatment Unit

This study investigated whether a specialised intervention programme could improve diabetes-related health outcomes in indigent patients with type 1 diabetes who were prone to occurrence of diabetic ketoacidosis (DKA). Patients (n=115) with type 1 diabetes mellitus admitted because of DKA during a 24-month period were invited to receive outpatient care in a diabetes treatment unit (DTU). DKA-related readmission rates, change in haemoglobin A1c (HbA1c) values, and diabetes-related medical costs were compared in patients who participated in the DTU programme (+DTU) and in those who did not (-DTU). They concluded that this relatively low-cost intervention by a dedicated outpatient diabetes treatment unit resulted in significant decreases in DKA-associated readmissions, in HbA1c values, and in costs of diabetes care in a multiethnic, indigent, ketosis-prone patient population (Maldonado et al 2003).



The Adjust Programme

Many nurses combine discharge planning and patient education. One model that formalised this function for people with diabetes demonstrated decreased lengths of stay, costs, and readmissions. A study was undertaken in Columbus Regional Medical Center in Columbus, GA (413 bed tertiary centre). The admission rate for this centre in 1998 was 16,799 (2% diabetes primary, 9.8% diabetes secondary). ALOS 7.5 days in 1996, reduced to 4.2 days in 2001, readmission rate 82 in 1996, reduced to 22 in 2001. Due to formalising the combination of discharge planning with patient education, a reduction in LOS, associated costs and readmissions were seen. All inpatients with diabetes received the intervention. Diabetes education and patient support moved to a discharge-planning department. The number of personnel expanded from 1/3 FTE diabetes nurse specialist to 2 fulltime diabetes nurse specialists and a part-time secretary. The service provided incorporated a mixture of patient education and discharge planning functions. The diabetes nurse specialists worked within a Discharge Planning Department allowing for provision of interfaces with community services. Financial advantages, through reduced lengths of stay and a reduction in recidivistic admissions, were yielded despite the initial investment in service required (Leichter et al 2003).



Assessment tools

Structure

Every district health board (DHB) should have a local diabetes inpatient team and up-to-date guidelines to support hospital staff to manage uncontrolled diabetes or diabetic ketoacidosis in place.

Process

- (a) The proportion of people admitted to hospital with diabetic ketoacidosis who receive educational and psychological support by a specialist diabetes team prior to discharge.

Numerator	The number of people in the denominator receiving educational and psychological support by a specialist diabetes team prior to discharge
Denominator	The number of people admitted to hospital with diabetic ketoacidosis

- (b) The proportion of people admitted to hospital with diabetic ketoacidosis who receive follow-up within 30 days after discharge by a specialist diabetes team.

Numerator	The number of people in the denominator receiving follow-up within 30 days after discharge by a specialist diabetes team
Denominator	The number of people discharged from hospital following an admission for diabetic ketoacidosis

Outcomes

- Reduced lengths of stay for people with diabetes admitted for uncontrolled diabetes.
- Reduction in readmission rates within 12 months for people admitted with diabetic ketoacidosis.
- Reduction in readmission rates within 12 months for people admitted with hyperosmolar hyperglycaemic nonketotic syndrome.
- Increased percentage of staff who feel that they have sufficient levels of appropriate and timely support from the Diabetes Inpatient Specialist Team.
- Psychosocial outcome: Increased percentage of patients who express satisfaction with their patient journey, using validated tools such as the Diabetes Treatment Satisfaction Questionnaire (DTSQ) and the Diabetes Treatment Satisfaction Questionnaire for inpatients (DTSQ-IP).



Resources

Paediatric and Adolescent Diabetic Ketoacidosis (DKA) Management Guidelines

New Zealand National clinical network for child and youth diabetes, 2014

www.starship.org.nz/media/273118/starship_dka_guideline_2014_v.2yellowhighlightsremovetextboxes.pdf



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Standard 15

People with diabetes who have experienced severe hypoglycaemia requiring emergency department attendance or admission should be actively followed up and managed to reduce the risk of recurrence and readmission.

Key practice points

- Hypoglycaemia is the principal problem associated with strict glycaemic control.
- Hypoglycaemia is a common side effect of insulin therapy in diabetes, particularly in people with type 1 diabetes.
- Following an episode of severe hypoglycaemia, follow-up should be carried out by a health professional with specialist knowledge of diabetes.
- The inpatient or emergency department (ED) team should schedule appropriate outpatient follow-up prior to discharge.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure patients experiencing severe hypoglycaemia requiring ED attendance or admission are actively followed up and managed.

Health care professionals ensure they know how to manage severe hypoglycaemia and have services in place to actively follow-up after an ED attendance or admission to avoid the risk of recurrence or readmission.

Planners and funders ensure they commission and adequately resource services to provide appropriate care and active follow-up for people experiencing hypoglycaemia requiring ED attendance or admission.

People with diabetes who have experienced severe hypoglycaemia requiring ED attendance or admission will be actively followed up and managed to reduce the risk of recurrence and readmission.

Definitions

Severe hypoglycaemia

Severe hypoglycaemia is defined as any episode of hypoglycaemia requiring external help (Leese et al 2003).



Introduction

Achieving glycaemic control as close to normal levels as possible is recommended for most people with diabetes with type 1 or type 2 diabetes to minimise the risk of complications (Diabetes Control and Complications [DCCT] Research Group 1997; United Kingdom Prospective Diabetes Study 1998). The increased treatment costs of achieving this are offset by the reduced cost of treating complications and an improved quality of life (Gray et al 2000). Hypoglycaemia, however, is the principal problem associated with strict glycolic control (DCCT Research Group 1997).

Hypoglycaemia is a common side effect of insulin therapy in diabetes, particularly in people with type 1 diabetes. Episodes of mild hypoglycaemia (self-treated) can occur frequently (1–2 episodes per week) (Pramong et al 1991; Pramong et al 2000) while severe hypoglycaemia affects up to 30% of people with type 1 diabetes annually (EURODIAB IDDM Complications Study Group 1994; ter Braak et al 2000). In the DCCT (1997), overall rates of severe hypoglycaemia were 61.2 per 100 patient-years versus 18.7 per 100 patient-years in the intensive and conventional treatment groups respectively, with a relative risk (RR) of 3.28. The relative risk for coma and/or seizure was 3.02 for intensive therapy. According to Leese et al (2003), most episodes of severe hypoglycaemia are treated effectively at home or at work by friends, relatives, or colleagues and do not require the assistance of the emergency medical services. Therefore, episodes presenting to and treated in the hospital emergency department are recognised as representing the ‘tip of the iceberg’ (Potter et al 1982). In their population-based study of health service resource use, Leese et al reported that nearly 1 in 14 people with insulin-treated diabetes experiences one or more episodes of severe hypoglycaemia annually that requires the urgent therapeutic intervention of health service personnel. Although severe hypoglycaemia is more common in type 1 diabetes, insulin treatment rather than the type of diabetes was the predominant feature.

In type 2 diabetes, the risk of hypoglycaemia with sulfonylurea therapy is often underestimated and prolonged due to the duration of the action of the tablets. People at particular risk are patients with renal impairment or the elderly (Joint British Diabetes Societies for Inpatient Care Group 2010). According to the Joint British Diabetes Societies (2013), hypoglycaemia is associated with increased morbidity and mortality, leading to coma, hemiparesis and seizures. ‘If the hypoglycaemia is prolonged the neurological deficits may become permanent. Acute hypoglycaemia impairs many aspects of cognitive function, particularly those involving planning and multitasking. The long term effect of repeated exposure to severe hypoglycaemia is less clear’ (p 10).

In the DCCT approximately 30% of patients in both the treatment groups experienced a second episode within the four months following the first episode of severe hypoglycaemia. Within each treatment group, the number of prior episodes of hypoglycaemia was the strongest predictor of the risk of future episodes, followed closely by the current HbA_{1c} value. Those found to be more at risk included males, adolescents, and people with no residual C-peptide or with a prior history of hypoglycaemia. Leese et al reports that people who were older, had a longer duration of diabetes, or a higher HbA_{1c} were more at risk. Those with impaired awareness of hypoglycaemic symptoms are at an increased risk of experiencing severe hypoglycaemia. ‘Impaired awareness of hypoglycaemia (IAH) is an acquired syndrome associated with insulin treatment. IAH results in the warning symptoms of hypoglycaemia becoming diminished in intensity, altered in nature or lost altogether. This increases the vulnerability of affected individuals of progression to severe hypoglycaemia (JBDS 2013, p 9).’

IAH prevalence is seen more commonly in type 1 than in type 2 diabetes, with a growing prevalence as the duration of diabetes increases (JBDS 2013).

Hypoglycaemia is the commonest diabetes-related contact with ambulance crew and Accident and Emergency (A&E) in the UK (Joint British Diabetes Societies for Inpatient Care Group 2013). One study investigating hypoglycaemia-related ambulance callouts revealed many people with diabetes did not know how to use glucagon, nor were they aware of the warning signs of hypoglycaemia, and they had not had a specific education session with a doctor or nurse about hypoglycaemia and how to avoid it in the previous year or at any time. The cost to society through ambulance attendance and possible transfer to secondary care, and associated cost through days off work and lost productivity was estimated to be £240,800 per 1000 ambulance attendances. Improved support and enhanced education and understanding of hypoglycaemia would translate into reduced costs and significant savings (Joint British Diabetes Societies for Inpatient Care Group 2013).

Follow-up care after an episode of hypoglycaemia should occur, preferably by a health care professional with specialist knowledge of diabetes. In particular, patients with reduced awareness of hypoglycaemia need intensive input from a specialist diabetes team (Brackenridge et al 2006). Most studies affirm patients that are scheduled or seen for post-hospital follow-up are less likely to be readmitted (Balaban et al 2008). The optimal time interval between discharge and the first follow-up is not known as many factors contribute to the decision, including severity of the disease process, perceived ability of the patient to provide adequate self-care, and psychosocial and logistical factors (Misky et al 2010).



Guidelines

The **New Zealand Primary Care Handbook 2012** recommends seeking specialist advice in situations of recurrent hypoglycaemia: www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012.

The **Scottish Intercollegiate Guidelines Network (SIGN)** guidelines (2010) provide the following recommendations:

- Adults with type 1 diabetes experiencing problems with hypoglycaemia or who fail to achieve glycaemia targets should have access to structured education programmes based upon adult learning theories (see Standard 1).
- Basal insulin analogues are recommended in adults with type 1 diabetes who are experiencing severe or nocturnal hypoglycaemia and who are using an intensified insulin regimen.
- Continuous Subcutaneous Insulin Infusion (CSII) pump therapy should be considered in people who experience recurring episodes of severe hypoglycaemia.
- Individualised advice on avoiding hypoglycaemia when exercising by adjustment of carbohydrate intake, reduction of insulin dose, and choice of injection site, should be given to people taking insulin.
- People with diabetes and health care professionals should make every effort to avoid severe hypoglycaemia, particularly in those who are newly diagnosed.
- Treatment to glycaemia targets increases the incidence of hypoglycaemia. Significantly more episodes were reported in intensive versus conventional therapy groups in most studies, eg, The ACCORD and ADVANCE trial (SIGN, 2010).

The complete guidelines can be found here: www.sign.ac.uk/pdf/sign116.pdf

National Institute of Health and Care Excellence (NICE) guidelines recommend the following:

When hypoglycaemia becomes unusually problematic or of increased frequency, a review should be made of the following possible contributory causes:

- Inappropriate insulin regimens (incorrect dose distributions and insulin types).
- Meal and activity patterns, including alcohol.
- Injection technique and skills, including insulin resuspension.
- Injection site problems.
- Possible organic causes including gastroparesis.
- Changes in insulin sensitivity (the latter including drugs affecting the renin-angiotensin system and renal failure).
- Psychological problems.
- Previous physical activity.
- Lack of appropriate knowledge and skills for self-management (NICE 2004).

The full guidelines can be found here: www.nice.org.uk/guidance/CG15/chapter/1-Guidance.

Craig et al (2011) for the **Australian Type 1 Diabetes Expert Advisory Group** suggest the following for type 1 diabetes in children, adolescents and adults:

- Acute treatment of hypoglycaemia is usually highly effective.
- In all cases of hypoglycaemia, consideration of the cause is paramount.
- Occurrence of severe episodes of hypoglycaemia may be minimised by identifying and managing risk factors.
- Reassessment of the treatment regimen is required to identify precipitating and predisposing factors that have contributed to the severe hypoglycaemia.
- The person with diabetes will need to work closely with the treating multidisciplinary diabetes care team of health professionals to reduce the risk of recurrence of severe hypoglycaemia.
- It is the overall diabetes management package (diet and exercise) and blood glucose targets and monitoring that will help to minimise hypoglycaemia episodes.
- In people with a lack of hypoglycaemia awareness or 'hypoglycaemia unawareness', specific education programmes to help recognise symptoms of hypoglycaemia and to reduce further severe hypoglycaemia may be implemented and should be considered.

The **Joint British Diabetes Societies** Guideline: The Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus states 'People with diabetes who are admitted to hospital with hypoglycaemia are reviewed by a specialist diabetes physician or nurse prior to discharge' (p 19).



Implementation advice

The **New Zealand Society for the Study of Diabetes** (NZSSD) identifies the following points in their consensus statement on their Inpatient Consensus Statement (2013):

Every person with diabetes who is hospitalised has the right to:

- receive optimum diabetes care based on ‘best practice’
- have a hospital stay free from harm (especially insulin, medication and food errors) and not inappropriately prolonged as a result of their diabetes management
- have access to specialist diabetes advice/care
- where practically possible, be actively involved in their own diabetes management during their hospital stay
- diabetes care following discharge from hospital that is timely, appropriate and well-informed

(www.nzssd.org.nz/documents/misc/13%2007%20NZSSD%20Inpatient%20Consensus%20Statement%20-%20Final%20version.pdf).

Severe hypoglycaemia is a recognised common medical emergency, and must be treated appropriately. In the majority of cases, people with type 1 diabetes should be under specialist care.

The District Health Board (DHB) should:

- have a ‘clinical lead’ for the management of diabetes
- have the services of a dedicated Diabetes Inpatient Specialist Nurse (DISN) at staffing levels most recently recommended by Diabetes UK (1.0 FTE per 300 beds) (NICE 2011)
- collect data about the outcomes for patients admitted with severe hypoglycaemia
- have a Quality Assurance Scheme in place to ensure accuracy of blood glucose meters
- have a training programme in place for all health care staff expected to prescribe, prepare and administer insulin (eg, the safe use of insulin and the safe use of intravenous insulin e-learning packages from National Health Service [NHS] Improving Quality)
- ensure they commission a service providing access to a specialist diabetes team prior to a patient’s discharge with follow-up after discharge for all patients presenting to the Emergency Department or admitted to hospital with severe hypoglycaemia.

Ambulance services

The role of the ambulance service in managing severe hypoglycaemia is now recognised; therefore, determining the local call-out rates to ambulance crews and ensuring appropriate management pathways for treatment and follow-up are in place.

Emergency department

- Implement guidelines and protocols for rapid diabetes assessment and treatment.
- Identification of diabetes patients suitable for ambulatory care using proven pathways.
- Engagement with MDT diabetes inpatient team to optimise diabetes care planning and discharge from ED when appropriate.

Specialist care

- Provide follow-up for referrals relating to hypoglycaemia.
- Provide diabetes In-Reach to ED/wards through a dedicated Diabetes Inpatient Team.
- Access to psychological referral.
- Access to a diabetes specialist nurse helpline during working hours for advice surrounding hypoglycaemia.
- When hypoglycaemia becomes unusually problematic or of increased frequency, review should be made of possibly contributory causes and follow-up put in place.

Hospital services

- Discharge summaries should be transmitted to the primary health care professional as soon as possible after ED attendance or discharge.
- Information on medication changes, pending tests and studies and follow-up needs should be communicated clearly to the primary health professional.
- Using a template for discharge summaries is helpful to ensure inclusion of relevant information.
- The inpatient team should schedule outpatient follow-up with the appropriate professional (GP, endocrinologist, diabetes nurse specialist) prior to discharge.
- Specific education on the detection and management of hypoglycaemia in adults with problems of hypoglycaemia awareness should be offered.
- Discharge planning should start at hospital admission and clear diabetes management instructions should be provided at discharge.
- When feasible, care systems should support team-based care, and embedded decision support tools to meet patient needs.

All information about treatment and care, including advice on avoiding hypoglycaemia, should take into account age and social factors, language, accessibility, physical, sensory or learning difficulties, and should be ethnically and culturally appropriate.



Implementation examples / innovations



Structured programmes for patients who have significant problems with hypoglycaemia

A number of structured education programmes have been developed specifically for patients who have significant problems with hypoglycaemia. These include Hypoglycaemia Anticipation, Awareness and Treatment Training (HAATT) (Cox et al 2004), HyPOS (Hermanns et al 2007) and Blood Glucose Awareness Training (BGAT) (Cox et al 2006). Improvements in hypoglycaemia rates and awareness seen in these programmes are not associated with deterioration in overall glycaemia control.



Joint British Diabetes Societies for Inpatient Care Group, 2013

Many patients with diabetes need advice on high blood glucose levels, ketosis, or hypoglycaemia and this forms a substantial part of the work of many diabetes teams. Access to specialist advice by phone reduces the risk of these problems progressing to emergency call out and/or hospital admission. This service is commonly unavailable out of hours, when patients at risk would contact on-call GP services, call 111, attend ED, or contact untrained junior medical staff in hospitals (Joint British Diabetes Societies for Inpatient Care Group 2013).



Waikato Regional Diabetes Service

Waikato DHB's regional diabetes service provides two on-call services. The first is for patients enrolled in their service who need urgent advice out of clinic hours on things such as managing illness, ketones, and hyper/hypoglycaemia. The on-call service also takes referrals for after hours support under specific circumstances, ie, post hospital discharge and pregnancy monitoring in type 1. The second service is for general practitioners, practice nurses and pharmacists in the region who can email or telephone for advice and information about any patient in their care. The service is staffed by diabetes clinical nurse specialists with access to diabetes physicians, dietitians and podiatrists.



Capital & Coast DHB

Capital & Coast DHB/Wellington Diabetes and Endocrinology Service have an agreement with the local ambulance service. This involves notifying the Diabetes and Endocrinology Service when people with diabetes are frequently seen by the ambulance service for diabetes-related callouts – most often as a result of a hypoglycaemia episode.

- People with a single ambulance attendance are referred back to their GP.
- People with their second or more attendance within one month are referred to the Diabetes and Endocrinology Service.
- A three-monthly report is submitted identifying multiple attendances over this time.
 - These individuals are discussed with the Diabetes Team and seen at an outpatient diabetes clinic if needed (often not previously referred by the Primary Care team).

All children given glucagon in the community are transported to ED for observation, and notification is made to the paediatric team.



Project RED (Re-Engineered Discharge)

A re-engineered hospital discharge programme to decrease rehospitalisation: a randomised trial

The RED programme was developed to minimise hospital utilisation after discharge. A set of mutually reinforcing components that define a high quality hospital discharge were created. Components of the RED:

- educate the patient about diagnosis throughout the hospital stay
- make appointments for follow-up and post-discharge testing, with input from the patient about time and date
- discuss with the patient any tests not completed in the hospital
- organise post-discharge services

- confirm the medication plan
- reconcile the discharge plan with national guidelines and critical pathways
- review with the patient appropriate steps of what to do if a problem arises
- expedite transmission of the discharge summary to clinicians accepting care of the patient
- assess the patient's understanding of this plan
- give the patient a written discharge plan
- call the patient 2–3 days after discharge to reinforce the discharge plan and help with problem solving.

Intervention: A nurse discharge advocate worked with patients during their hospital stay to arrange follow-up appointments, confirm medication reconciliation, and conduct patient education with an individualised instruction booklet that was sent to their primary care provider. A clinical pharmacist called patients two to four days after discharge to reinforce the discharge plan and review medications. Participants and providers were not blinded to treatment assignment. Primary outcomes were emergency department visits and hospitalisations within 30 days of discharge. Secondary outcomes were self-reported preparedness for discharge and frequency of primary care providers' follow-up within 30 days of discharge. Research staff doing follow-up were blinded to study group assignment. Participants in the intervention group (n = 370) had a lower rate of hospital utilization than those receiving usual care. The intervention was most effective among participants with hospital utilisation in the six months before index admission. The authors concluded that a package of discharge services reduced hospital utilisation within 30 days of discharge (Jack et al 2009). Project RED describes the programme in more detail. There are other related publications and the RED tools and nurse training manual available for download at no cost. More information can be found here: www.transitionalcare.info/.



National Transitions of Care Coalition (NTOCC)

On this site there are a number of downloadable tools that aim to improve the patients' understanding of their medications and health care visits. There is also advice on how to perform medication reconciliation and implement a transition of care programme. It is available at: www.ntocc.org/ Click on the tab marked 'Health Care Professionals'.

The most recent resource published on this website is the Transition of Care Compendium. The compendium contains a collection of white papers, journal articles, and websites with resources that both professionals and consumers might find useful in a practice or medical situation. The Compendium is available at: www.ntocc.org/Toolbox



Assessment tools

Structure

Evidence of local arrangements to ensure people with diabetes who experience severe hypoglycaemia requiring ED attendance or admission to hospital are referred to a specialist diabetes team or general practice team for follow-up.

Process

The proportion of people with diabetes who have experienced severe hypoglycaemia who are referred for follow-up to manage their diabetes.

Numerator	The number of people with diabetes in the denominator referred to a specialist diabetes or general practice team
Denominator	The number of people with diabetes who have experienced severe hypoglycaemia requiring ED attendance or admission to hospital

Outcomes

- a) Reduction in the number of people with diabetes requiring ED attendance or admission as a result of a hypoglycaemic episode.
- b) Reduction in the rate of recurrence of an episode of hypoglycaemia requiring medical attention over 12 months.



Resources

Hypoglycaemia Provider Checklist – for use during follow-up

A workgroup of the American Diabetes Association and the Endocrine Society reviewed recent evidence about the impact of hypoglycaemia on people with diabetes. To assist in an efficient assessment of the person at risk of hypoglycaemia, a two-fold process is recommended. To begin with, the person with diabetes completes a questionnaire prior to the consultation detailing how often they experience symptomatic and asymptomatic hypoglycaemia. Secondly, the patient is made aware of how to appropriately treat hypoglycaemia and reminded of the risks associated with driving (Seaquist et al 2013). To ensure that hypoglycaemia is effectively managed, the health provider could use a Hypoglycaemia Provider Checklist.

This ensures the provider:

- reviews the hypoglycaemia patient questionnaire
- discusses circumstances surrounding hypoglycaemic episodes
- discusses strategies to avoid hypoglycaemia
- makes medication changes where appropriate
- recommends carrying treatment and provides instruction on how to take it
- prescribes glucagon if appropriate.

A copy of the questionnaire is available here:

<http://care.diabetesjournals.org/content/36/5/1384.full.pdf+html>.

Health Mentor Online is a self-directed online learning resource for nurses to complete Levels 1 and 2 on the National Diabetes Nursing Knowledge and Skills Framework: <http://pro.healthmentoronline.com>. It also provides consumer information here: www.healthmentoronline.com.



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Special groups



Standard 16

Young people with diabetes should have access to an experienced multidisciplinary team including developmental expertise, youth health, health psychology and dietetics.

Key practice points

- Young people with type 2 diabetes are at increased risk of morbidity and mortality. The prevalence of type 2 in children and young people is rising and this population group should not be overlooked.
- Young people with diabetes require support from a multidisciplinary team with specific developmental expertise.
- Health care needs to be aligned with their age as well as their diabetes.
- 15–24 year olds with diabetes should have access to an adolescent service.
- Schools should have diabetes information and individual records for each child with diabetes enrolled in their facility.
- Parents and caregivers, including education facilities, should be included in education and support.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that young people with diabetes have access to an experienced co-located multidisciplinary team including developmental expertise, youth health, health psychology and dietetics.

Health care professionals ensure that the young person with diabetes has access to a co-located team of experienced multidisciplinary health professionals including developmental and youth health experts, a health psychologist and dietitian.

Planners and funders ensure they commission services that provide young people with diabetes with access to an experienced co-located multidisciplinary team including developmental expertise, youth health, health psychology and dietetics.

Young people with diabetes have access to an experienced co-located multidisciplinary team of health professionals including developmental and youth health experts, a health psychologist and a dietitian.



Introduction

The term 'young people' includes individuals up to the age of 25 who, based on different needs, can be divided into children, adolescents and young adults. Diabetes Youth New Zealand states there are about 2500 children and young people aged 0 to 18 years living with type 1 diabetes in New Zealand and about 200 with type 2. Numbers are estimated to be growing by 10% annually. While type 2 is often thought to be the milder form of diabetes, research has demonstrated that young onset type 2 is the more lethal phenotype, being associated with greater mortality, more complications and unfavourable cardiovascular risk factors than type 1 (Constantino et al 2013). In response to growing awareness of the risks associated with early onset type 2 diabetes, the Diabetes Care journal published a series of articles on the TODAY (Treatment Options for Type 2 diabetes in Adolescents & Youth) study, a randomised clinical trial testing the safety and effectiveness of three treatment interventions. They can be accessed here: <http://care.diabetesjournals.org/site/misc/todayseries.xhtml>.

For children and young people, it is important for care and support to be provided by practitioners who are appropriately educated and experienced. Issues such as trust and rapport are particularly important when working with young people, as is the tailored delivery and content of information and advice.

While children and adolescents face many of the same challenges as adults with diabetes, they have additional ones due to the fact that they:

- are still growing and need to balance dietary control with nutritional needs and desires
- are emotionally and intellectually immature
- need support and information pitched at an appropriate level for the individual
- are subject to peer influence – both positive and negative
- may need to deal with contraceptive/pregnancy concerns (see Standard 20)
- are presenting as individuals but within a family/whānau structure and need parental support. That support, however, needs to enable autonomy as they make the transition to adulthood and increasingly take control of their own treatment decisions and self-management.

Engagement and education of family/whānau members is therefore important, as is that of educational facilities where children and young people spend considerable amounts of time (refer to the resources section). It is suggested that schools and other educational facilities should not only have specific information about diabetes but should also have individual records for each child with diabetes enrolled in the facility, in order to support their daily diabetes needs as well as respond to emergency situations. A multidisciplinary team approach to care delivery for both individual and family/whānau is therefore required. The team should include developmental expertise, youth health specialists (eg, paediatrician, endocrinologist), diabetes clinical nurse specialist/nurse practitioner, health psychology and dietetics. Brierley et al (2010) suggest that an ideal service would also incorporate psychological support for the professional team as working with young people is emotionally challenging.

The need for psychological support of young people with diabetes is borne out by research findings. A review by Cameron et al (2007) noted that psychological morbidity is increased in children with diabetes just as with other chronic conditions. 'Initial adjustment to diabetes is characterised by sadness, anxiety, withdrawal and dependency and ~30% of children develop a clinical adjustment disorder in the three months after diagnosis. Such difficulties often resolve within the first year but poor adaptation in this initial phase places children at risk for later psychological difficulties' (p 2717). Longitudinal studies have found long term prevalence of psychiatric disorder in those with youth diabetes to be 2–3 times that found in the general population. The authors conclude that as mental health issues appear to be prognostic of maladaptive lifestyle practices, long term glycaemic control issues and early onset of complications, mental health screening should be considered as important as screening for other complications. 'Routine screening for behavioural disturbance should begin in children at the time of diabetes diagnosis, with further assessment of parental mental health and family functioning for at-risk children. Interventions can then be targeted based on the specific needs of individual children and families' (p 2720).

A recent study in the *Journal of Adolescent Health* identified a pattern of declining glycaemic control in the six years following diagnosis and concluded that psychosocial burdens, particularly diabetes-related quality of life, were instrumental. Depression levels were higher in those with type 2 than those with type 1 (Hood et al 2014).

Adherence among young people is a big issue, leading to early diabetes-related complications. Hanghøj and Boisen's (2013) review of 28 studies of self-reported barriers to medication adherence among adolescents identified a range of barriers including forgetting; lack of motivation; stress and burnout; time pressure and lack of planning; lack of social support – including parental autonomy support; rebellion – not wanting to be told what to do; stigma of being different from peers; embarrassment; and being influenced by peers' poor medication habits.

As children generally present within a family/whānau context, provision of parental education and support is an integral part of caring for the child with diabetes. Not only can parents support their child's understanding of their condition and the importance of medication and lifestyle, but they are also responsible for creating the home environment within which the child grows up. However, the way in which parents provide support has been found to impact on their children's outcomes, particularly during adolescence. In reviewing the literature, Moore et al (2013) concluded that better metabolic control was associated with greater parental responsiveness, defined as communication of warmth, love and acceptance; better emotional and financial family/whānau resources; and stronger parental attachment. Their own Australian study of families with a teenager with type 1 found poorer metabolic control and less adequate self-care to be associated with lower levels of family functioning, more adolescent behavioural difficulties and poorer adolescent mental health. They concluded that 'the findings of the current study suggest the importance not only of providing information on diabetes to families, but of providing parents and adolescents with information and support on how best to strengthen their relationships, manage their emotions and maintain open communication channels in order to assist the young people with type 1 diabetes in their transition to the independent self-management of their condition' (Hood et al 2014).



Guidelines

The **Australasian Paediatric Endocrinology Group** (APEG 2011) 'National Evidence-Based Clinical Care Guidelines for Type 1 Diabetes in Children, Adolescents and Adults' can be found here: www.apeg.org.au/portals/o/guidelines1.pdf.

International Diabetes Federation (IDF) / International Society for Pediatric and Adolescent Diabetes (ISPAD)

The IDF/ISPAD (2011) 'Global Guidance for Diabetes in Childhood and Adolescence' can be found here: www.idf.org/sites/default/files/Diabetes-in-Childhood-and-Adolescence-Guidelines.pdf.

The guidelines are presented as a series of chapters addressing the following:

1. Definition, epidemiology and classification
2. Phases of type 1 diabetes
3. Type 2 diabetes
4. Monogenic diabetes
5. Diabetes education
6. Structures, processes and outcomes of ambulatory diabetes care
7. Assessment and monitoring of glycaemic control
8. Insulin treatment
9. Nutritional management
10. Diabetic ketoacidosis
11. Assessment and monitoring of hypoglycaemia
12. Sick day management
13. Exercise
14. Management of children requiring surgery
15. Psychological care
16. Diabetes in adolescence
17. Microvascular and macrovascular complications
18. Other complications and associated conditions

The 2011 **Australian Clinical Management Guidelines** for people with type 1 diabetes provides specific information for the management of children and adolescents: www.nhmrc.gov.au/_files_nhmrc/publications/attachments/ext004_type1_diabetes_children_adolescents_adults.pdf.

A summary of the guidelines for children with type 1 is provided by Hatherly et al (2011, pp 379–80) as follows: ‘Care should be delivered, at least 3–4 times annually, by a specialist multidisciplinary paediatric team, including paediatric endocrinologists or physicians, diabetes educators (*diabetes nurse specialists in the New Zealand context*), paediatric dieticians, a social worker and/or psychologist. With respect to glycaemic control, the guidelines recommend that all children (aged six years and over) aim to achieve an HbA_{1c} <58 mmol/mol, without an increase in hypoglycaemia, and that regular screening for diabetes related complications is performed’.

The National Institute for Health and Care Excellence (NICE) guidelines for the diagnosis and management of type 1 and type 2 diabetes in children and young people are currently under development with an intended completion date of August 2015. Information about this process is available here: <http://guidance.nice.org.uk/CG/WaveR/118>

Starship Children’s Health provides information and clinical guidelines on managing ketoacidosis in young people. They state, ‘diabetic ketoacidosis (DKA) is a life-threatening metabolic disorder resulting from decreased effective circulating insulin, insulin resistance and increased production of counter-regulatory hormones. The frequency of DKA ranges from 16–80% of children newly diagnosed with diabetes, depending on geographic location. It is the leading cause of morbidity and is the most common cause of diabetes-related deaths in children and adolescents with type 1 diabetes. Mortality is predominantly due to cerebral oedema which occurs in 0.3% to 1% of all episodes of diabetic ketoacidosis in children’.

Further information can be found at:

www.starship.org.nz/media/273118/starship_dka_guideline_2014_v.2yellowhighlightsremovetextboxes.pdf



Implementation advice

A care pathway for children with type 1 was provided by New Zealand’s Diabetes Workforce Service Review (2011) on page 53:

www.health.govt.nz/system/files/documents/pages/diabetes-workforce-service-review.pdf.

NICE provides a care pathway with links to associated advice and information for managing children and young people with type 1:

<http://pathways.nice.org.uk/pathways/diabetes?fno=1#path=view%3A/pathways/diabetes/managing-type-1-diabetes-in-children-and-young-people.xml&content=view-node%3Anodes-diet-and-lifestyle-advice>

The following table taken from Chiang et al (2014) summarises the developmental stages children and young people move through and the developmental tasks and type 1 diabetes management required at each.

Developmental stages (ages)	Normal developmental tasks	Type 1 diabetes management priorities	Family issues in type 1 diabetes management
Infancy (0–12 months)	Developing a trusting relationship or bond with primary caregiver(s)	Preventing and treating Hypoglycaemia Avoiding extreme fluctuations in blood glucose levels	Coping with stress Sharing the burden of care to avoid parent burnout
Toddler (13–36 months)	Developing a sense of mastery and autonomy	Preventing hypoglycaemia Avoiding extreme fluctuations in blood glucose levels due to irregular food intake	Establishing a schedule Managing the picky eater Limit-setting and coping with toddler's lack of cooperation with regimen Sharing the burden of care
Preschooler and early elementary school (3–7 years)	Developing initiative in activities and confidence in self	Preventing hypoglycaemia Coping with unpredictable appetite and activity Positively reinforcing cooperation with regimen Trusting other caregivers with diabetes management	Reassuring child that diabetes is no one's fault Educating other caregivers about diabetes management
Older elementary school (8–11 years)	Developing skills in athletic, cognitive, artistic, and social areas Consolidating self-esteem with respect to the peer group	Making diabetes regimen flexible to allow for participation in school or peer activities Child learning short and long term benefits of optimal control	Maintaining parental involvement in insulin and blood glucose management tasks while allowing for independent self-care for special occasions Continuing to educate school and other caregivers
Early adolescence (12–15 years)	Managing body changes Developing a strong sense of self-identity	Increasing insulin requirements during puberty Diabetes management and blood glucose control becoming more difficult Weight and body image concerns	Renegotiating parent and teenager's roles in diabetes management to be acceptable to both Learning coping skills to enhance ability to self-manage Preventing and intervening in diabetes-related family conflict Monitoring for signs of depression, eating disorders, and risky behaviours
Later adolescence (16–19 years)	Establishing a sense of identity after high school (decisions about location, social issues, work, and education)	Starting an ongoing discussion of transition to a new diabetes team (discussion may begin in earlier adolescent years) Integrating diabetes into new lifestyle	Supporting the transition to independence Learning coping skills to enhance ability to self-manage Preventing and intervening with diabetes-related family conflict Monitoring for signs of depression, eating disorders, and risky behaviours

Brink and Chiarelli (2004) adopt a time line approach and summarise the needs of young people and adolescents and the time at which they should be addressed as follows:

At diagnosis

Survival education:

- How to administer insulin, how and what to monitor, who and when to call, beginning meal planning (NB. the advisory group felt that hypoglycaemic management should also be included at this stage).

Within 1–2 months following diagnosis

In-depth assessment and review:

- Insulin kinetics and administration, monitoring and use of SMBG data, meal planning, activity changes, sick day guidelines and DKA prevention/treatment, hypoglycaemia identification, recognition, prevention and treatment.
- Short term and long term treatment goals.
- Identification of barriers to improvement including school, learning and psychosocial and family issues.
- Establishment of follow-up guidelines and goals and responsibilities.

Yearly

In-depth assessment and re-education:

- All of the above plus additional needs including age-appropriate peer pressure, alcohol, sexual education, smoking prevention, eating disorders including bulimia, anorexia and obesity, diabetes-associated complications' assessment and ongoing barriers to control.



Implementation examples / innovations



Starship Children's Health in Auckland

Starship Children's Health in Auckland provides a diabetes adolescent transition programme and clinics with the following aims:

- identifying geographically specific adult services which are able to provide for the needs of young adults with diabetes in Auckland and presenting these options to families/whānau
- the provision of a clinic utilising an adolescent consultation model and facilitating the transition process
- development of clear, documented plans for transition
- good communication between all services providing care for the young person at the time of transition, including the primary care physician and other specialists
- the provision of adolescent specific education in a supportive non-threatening environment utilising available speciality services
- ensuring that there is no significant gap in care between leaving the paediatric service and entering the adult service and that the young person is not lost to follow-up care
- maintaining a database of all adolescents transferring to Adult Diabetes Services and subsequent capture of clinical data for a period of five years post-transition.

The transition programme team consists of endocrinologists, adolescent transition nurses, diabetes nurse specialists, social workers, and a clinical psychologist in addition to ongoing contact with the individual's own GP. More information can be found at:

<https://www.starship.org.nz/patients-and-families/youth-transition/diabetes-service/starship-diabetes-adolescent-transition-programme-and-clinics/>

and also at: https://www.starship.org.nz/media/248825/transition_starter_pack_2013.pdf



Counties Manukau District Health Board (DHB)

The Starship service includes access to the Centre for Youth Health which was established in 1996 by Counties Manukau DHB to deliver a range of specialist youth services, aiming:

- to promote the wellbeing and healthy development of young people within the context of their family/whānau and wider environment
- to provide young people with the comprehensive clinical health assessments
- to provide advocacy and support to health professionals working with young people
- to collaborate with other researchers in a range of relevant adolescent health research projects
- to promote and support policies, planning and legislation, that address the healthy development and wellbeing of young people.



Starship Children's Health

Starship also provides an insulin pump program, details of which can be found in Standard 17.



Type 1 Exchange Clinic Registry

The T1D Exchange Clinic Registry is a large scale study of children and adults with type 1 diabetes in the United States. Twenty-five thousand people have been enrolled and results have been published since 2013. Campbell et al (2014) compared 6–17 year olds with type 1 diabetes of >2 years duration with good control (HbA1c <53 mmol/mol, N=588) with those with poor control (HbA1c >75, N=2684). After controlling for demographic and socioeconomic factors, results showed the two groups differed significantly in diabetes management. More of the good control group used insulin pumps, monitored blood glucose five or more times daily, missed fewer boluses, bolused before meals rather than at or after mealtimes, used meal-specific insulin carbohydrate ratios, checked levels prior to administering mealtime insulin, used insulin with daytime snacks, used more bolus insulin and used a lower mean total daily insulin dose than those in the poor control group.



Waikato DHB

Waikato DHB's regional diabetes service provides two on-call services. The first is for patients enrolled in their service who need urgent advice out of clinic hours on things such as managing illness, ketones, and hyper/hypoglycaemia. The on-call service also takes referrals for after hours support under specific circumstances ie, post hospital discharge and pregnancy monitoring in type 1. The second service is for general practitioners, practice nurses and pharmacists in the region who can email or telephone for advice and information about any patient in their care. The service is staffed by diabetes clinical nurse specialists with access to diabetes physicians, dietitians and podiatrists.



Yale School of Nursing

The Yale School of Nursing has created a coping skills training programme to teach communication and problem-solving skills in order to improve peer, school and family relationships and enhance self-management for adolescents with type 1. Results of studies suggest that the programme might be moderately more effective than standard diabetes education in improving self-management skills and controlling glycaemic levels. The original programme includes weekly small group sessions with a trained facilitator, but in acknowledgement of scheduling issues a web-based programme and forum has also been developed. More information can be found at: <http://innovations.ahrq.gov/content.aspx?id=2131>.



Assessment tools

In assessing whether guidelines were being met, Hatherly et al (2011) measured access to the following range of practitioners: endocrinologist, paediatrician, diabetes nurse specialist, dietitian, psychologist, social worker, and general practitioner. The following targets, adapted from the guidelines, were also assessed:

- care received from a full multidisciplinary diabetes team
- family as part of the management team
- received diabetes education from a diabetes nurse specialist
- attendance at three to four clinics annually
- annual nutrition review
- annual psychological care (psychologist/social worker)
- annual complications screening
- insulin pump offered as treatment option
- attended diabetes camp
- HbA_{1c} <59 mmol/mol.

The IDF guidelines (2011) state that diabetes teams should be able to register the numbers of adolescents in their district or region and be able to monitor attendance and metabolic control. Mechanisms should be in place for recalling patients who repeatedly fail to attend clinics.

Process

The proportion of young people with diabetes who have access to a multidisciplinary team with relevant knowledge and experience.

Numerator	The number of people in the denominator accessing a multidisciplinary team with relevant knowledge and experience
Denominator	The number of young people with diabetes



Resources

The **Kidshealth** organisation of New Zealand provides information on a range of topics specifically targeted at children and their parents. The diabetes topics are:

- blood glucose meters
- diabetes (brief)
- diabetes (detailed)
- diabetes: emotional and mental wellbeing concerns
- diabetes: healthy eating and physical activity
- diabetes: school information
- growing up and diabetes management (www.kidshealth.org.nz/tags/diabetes).

National Diabetes Education Program USA: The following site provides information for schools regarding the management of children with diabetes during the school day. It highlights the importance of glycaemic control, assisting children with diabetes care and having designated trained diabetes personnel:

<http://ndep.nih.gov/publications/PublicationDetail.aspx?PubId=97#effectivediabetesmanagement>

Evert (2004) discusses tools and techniques for working with young people with diabetes, with a particular focus on nutrition:

<http://spectrum.diabetesjournals.org/content/17/1/8.full.pdf+html>.

The **American Diabetes Association** provides a booklet designed specifically for adolescents with type 2 (the link to the full booklet appears to be broken but the individual links to sections are intact): www.diabetes.org/living-with-diabetes/parents-and-kids/children-and-type-2/.

Healthcare Research and Quality (AHRQ): A fact sheet about staying active for children with type 2 has been developed by the US Agency for Healthcare Research and Quality (AHRQ) and is available at: <http://ndep.nih.gov/media/tips-kids-be-active.pdf>.

International Diabetes Federation (IDF): Recommendations for standard and comprehensive adolescent care are provided by the IDF on pages 112-113 of their guidelines: www.idf.org/sites/default/files/Diabetes-in-Childhood-and-Adolescence-Guidelines.pdf. These address the roles of an interdisciplinary paediatric diabetes team, education, knowledge required by the team, education to be provided to the adolescent, and topics for discussion and advice.

A New Zealand site for adolescents with depression, including a quick self-check test, can be found at **the lowdown**: www.thelowdown.co.nz/#/home/.

A shortened version of the **Self Efficacy in Diabetes Management (SEDM)**, designed for children with type 1, was developed by Iannotti et al (2006). From a study of 168 10–16 year olds, the authors concluded that ‘self-efficacy and the interaction of self-efficacy with expectations of positive outcomes were significantly associated with diabetes self-management adherence and glycemic control in older adolescents. The effect of self-efficacy was greatest when adolescents had stronger beliefs in the beneficial outcomes of adherence. These brief measures can be used to identify youths at risk of poor diabetes self-management’ (p 98).

The measure has since been used in diabetes research with an adolescent population. Items for the self-efficacy measure are answered on a scale ranging from 1 (not sure at all) to 10 (completely sure) and follow the stem ‘how sure are you that you can do each of the following almost all the time?’

- Adjust your insulin correctly when you eat more or less than usual.
- Choose healthful foods when you go out to eat.
- Exercise even when you don’t really feel like it.
- Adjust your insulin or food accurately based on how much exercise you get.
- Talk to your doctor or nurse about any problems you’re having with taking care of your diabetes.
- Do your blood sugar checks even when you are really busy.
- Manage your diabetes the way your health care team wants you to.
- Manage your diabetes even when you feel overwhelmed.
- Find ways to deal with feeling frustrated about your diabetes.
- Identify things that could get in the way of managing your diabetes.



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Standard 17

All patients with type 1 diabetes should have access to an experienced multidisciplinary team, including expertise in insulin pumps and continuous glucose monitoring (CGMS) when required.

Key practice points

- All people with type 1 diabetes should be provided with multidisciplinary support from the time of diagnosis onwards.
- Type 1 diabetes should be provided with multidisciplinary support from the time of diagnosis onwards.
- The multidisciplinary team should ideally be co-located and must include expertise and experience in insulin pumps and continuous glucose monitoring.
- The multidisciplinary team should ideally be co-located and must include expertise and experience in insulin pumps and continuous glucose monitoring.
- Coding within patient records should specify the type of diabetes to enable a register to be maintained.
- Living with type 1 diabetes is challenging and the navigation of health care requirements is complex with the need for appointments and partnerships with multiple providers. Practitioners should be aware of these challenges when providing and organising patient-centred care.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure people with type 1 diabetes have access to an experienced co-located multidisciplinary team including expertise in insulin pumps and continuous glucose monitoring systems when required.

Health care professionals ensure they are competent to provide care to people with type 1 diabetes within a multidisciplinary team including expertise in insulin pumps and continuous glucose monitoring systems when required.

Planners and funders ensure they commission services that provide co-located multidisciplinary care to people with type 1 diabetes that includes expertise in insulin pumps and continuous glucose monitoring systems when required.

People with type 1 diabetes receive care from a multidisciplinary team and expert advice and support with insulin pumps and continuous glucose monitoring (CGMS) if required.

Overview

The information below is separated into two sections:

- type 1 diabetes management and multidisciplinary team approaches
- insulin pumps and continuous glucose monitoring systems.



Introduction

Type 1 diabetes management and multidisciplinary team approaches

Around 10% of people diagnosed with diabetes are thought to have type 1 diabetes and Ministry of Health statistics (2013) suggest this would include over 24,000 individuals in New Zealand. However the prevalence of type 1 is increasing in New Zealand and other countries.

Map of medicine

The Map of Medicine is an interactive tool based on evidence-based, practice-informed care maps which connect all the knowledge and services around a clinical condition.

The information associated with type 1 diabetes is that:

- it generally presents with acute hyperglycaemic symptoms:
 - polydipsia
 - polyuria
 - polyphagia
 - tiredness
- it is often associated with ketonuria
- it is often associated with marked weight loss
- it often presents in younger patients
- the initial management should be started by a diabetes specialist and involve the care of a multidisciplinary diabetic team.

<http://healthguides.mapofmedicine.com/choices/map-open/diabetes1.html>

Multidisciplinary team

Diabetes New Zealand (Diabetes NZ) notes the importance of the individual working with health care professionals as a member of the health care team. For the individual, an understanding of the condition is vital as is the need for identification of team members and clear discussions around roles and responsibilities in order to achieve the best possible care. Potential members of the team are identified for people with diabetes by Diabetes NZ as:

- the family/whānau or caregiver
- general practitioner (GP)
- practice nurse
- dietitian
- pharmacist
- diabetes nurse/diabetes nurse educator
- diabetes specialist (diabetologist)
- optometrist/ophthalmologist
- podiatrist
- psychologist
- other health professionals, such as a midwife for gestational diabetes
- diabetes support organisations, eg, Diabetes NZ, or the local diabetes society/support group.

Insulin pumps and continuous glucose monitoring systems

Insulin pumps

Continuous subcutaneous insulin infusion (CSII) or insulin pumps are small battery powered external devices that deliver insulin through an infusion line into the skin by a removable cannula. They are programmed to deliver a continuous low rate of insulin during the day and night (basal) with additional insulin being delivered (as a bolus dose) at mealtimes or to correct a high blood glucose level. At snack and mealtimes (whenever food is eaten), the user enters the amount of carbohydrate into their pump as well as their blood glucose level and the pump calculates how much insulin is needed for the food and to achieve the target blood glucose level (Starship Children's Health).

A review of the literature around the effectiveness and economy of insulin pump therapy was commissioned by the Ministry of Health and performed by the Health Services Assessment Collaboration at the University of Canterbury (Campbell et al 2008). They concluded that 'when compared with optimised MDI [multiple daily injections], CSII results in a modest but potentially worthwhile improvement in glycosylated haemoglobin levels in all patient groups assessed (ie, adults with type 1 diabetes, children and adolescents with type 1 diabetes, and adults with type 2 diabetes). Due to the short duration of the clinical trials is not possible to evaluate the longer term benefits of such a difference in HbA1c levels; however, there is an expectation that it would be reflected in a reduction in long term complications. Although more immediate primary benefits from CSII may be associated with an impact on the incidence of severe hypoglycaemic events and improved quality of life (through greater flexibility of lifestyle), there is limited evidence to support this from the studies identified in this update.

However, despite the limited evidence it is postulated that CSII may reduce the number of severe hypoglycaemic attacks a patient experiences compared with MDI. According to the results of the cost-effectiveness analysis conducted herein, it is estimated that if every patient who changed from MDI to CSII therapy was able to avoid one severe hypoglycaemic attack every two years (ie, an improvement of 0.5 events per annum), the incremental cost per severe hypoglycaemic event avoided would be approximately \$6,000. The total incremental cost associated with the introduction of CSII compared to MDI for a patient with type 1 diabetes is approximately (in 2008) \$16,000 over six years (the approximated life of the pump)' (p vi).

Goenka et al (2011) note that there will be an increase in the uptake of insulin pump use for people with type 1, estimates in the UK being 10% of those aged over 12 years and 25% of those under 12. Consequently, the initiation and management of pumps should be an integral part of a Diabetes Specialist Service and should involve a multidisciplinary team trained in pump management. The team should include staff with a special interest in insulin pump therapy and clinical, psychological and educational expertise.

Continuous glucose monitoring systems (CGMS)

Continuous glucose monitoring systems (CGMS) measure blood glucose levels semi-continuously. Most modern CGMS consist of a small needle which is inserted in the abdominal subcutaneous fat. The tip of the needle houses a small glucose sensor which can measure glucose levels in the fluid which surrounds the fatty tissue.

A Cochrane review of CGMS for type 1 diabetes mellitus (Langendam et al 2012) included 22 studies in which a total of 2883 patients were randomised to receive a form of CGM or to use self-measurement of blood glucose using fingerprick. The follow-up period ranged from three to 18 months with most studies reporting results for six months of CGM use. This review shows that CGM helps in lowering HbA1c. In most studies, the HbA1c value decreased in both the CGM and the self-monitoring of blood glucose (SMBG) users but more in the CGM group. The

difference in change in HbA1c levels between the groups was on average 0.7% for patients starting on an insulin pump with integrated CGM and 0.2% for patients starting with CGM alone. The most important adverse events, severe hypoglycaemia and ketoacidosis, did not occur frequently in the studies and absolute numbers were low (9% of the patients measured over six months).

The American Diabetes Association (ADA) recommendations (ADA 2014) state that when used properly, continuous glucose monitoring (CGM) in conjunction with intensive insulin regimens is a useful tool to lower HbA1c in selected adults (aged ≥ 25 years) with type 1 diabetes. Although the evidence for HbA1c lowering is less strong in children, teens, and younger adults, CGM may be helpful in these groups. Success correlates with adherence to ongoing use of the device. CGM may be a supplemental tool to SMBG in those with hypoglycaemia unawareness and/or frequent hypoglycaemic episodes.



Guidelines

Type 1 diabetes management and multidisciplinary team approaches

The New Zealand Diabetes Workforce Service Review (2011) provides a diabetes care pathway for type 1 diabetes and states ‘the emphasis is on diabetes care being led and provided by specialist services particularly in the first month and year following diagnosis. On an ongoing basis specialist oversight is required but the majority of care may be provided in general practice with support from specialist services. 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. Much of this care may be provided by nurse practitioners, specialist diabetes nurses and dietitians with expertise in type 1 diabetes and its complications. Other services will be required as the disease progresses and complications ensue, or for episodic care such as hospital admissions, travel plans, investigative procedure plans. Palliative care services are engaged at the appropriate stage and advanced care planning is embedded’ (p 18).

Ideally, the multidisciplinary care team should be co-located. Living with type 1 diabetes is challenging and the navigation of health care is complex with the need for appointments and partnerships with multiple providers.

The care pathway for children with type 1 can be found on page 53, and for adults aged over 18 years on page 54 (www.health.govt.nz/system/files/documents/pages/diabetes-workforce-service-review.pdf).

The National Institute for Health and Care Excellence (NICE) guidelines for people with type 1 diabetes are currently under review and will be finalised by August 2015. The 2004 guideline on diagnosis and management of type 1 diabetes in children, young people and adults is available here: www.nice.org.uk/Guidance/CG15.

Multidisciplinary teams

While there are no guidelines as such relating to teams, the following are requirements for a well-functioning multidisciplinary approach identified in a New Zealand report on multidisciplinary approaches in public health (Clewley et al 2005):

- clarity about the role and expertise of each team member
- a willingness to allocate tasks according to skills and joint responsibility for outcomes

- regular and effective communication, enhanced where possible by collocation, joint case notes or information technology systems
- support and ongoing education for team members
- flexible funding and employment arrangements
- rigorous and innovative research and evaluation into team processes, economic costs, and health outcomes with acknowledgement of the context in which the team operates
- development of a common understanding of vision and goals: provides the common ground for members of a team. Ideally the vision and goals are arrived at collaboratively by team members
- selecting the right team members: based not only on professional disciplines but also on appropriate skills and attitudes that are conducive to collaboration.

The report also identified the following obstacles to a multidisciplinary approach:

- turf protection/gate-keeping
- financial factors, eg, budget lines for ‘non-core’ work. Is the team funded as a separate entity (ie, budget line) or is funding drawn from the individual pre-existing budget lines of the professions/members involved?
- lack of professional training in multidisciplinary approaches
- logistics, eg, co-location, available meeting times, and physical resources
- differing reporting requirements for disciplines involved
- lack of formal evaluating criteria
- lack of trust between participating professions
- focus on professional autonomy
- legislative framework limiting the scope of professional practice.

Insulin pumps and continuous glucose monitoring systems

Insulin pumps

The Ministry of Health’s (2003) Service Specification provides, in no specific order, the following clinical priority access criteria for insulin pumps.

Patients with type 1 diabetes:

- with hypoglycaemic unawareness and autonomic neuropathy suffering recurrent severe hypoglycaemic episodes
- with poor glycaemic control and unacceptable fasting blood glucose levels due to a marked dawn phenomenon especially in adolescents
- with poor glycaemic control despite multiple daily injections (MDI) who are proven to have improved control with a trial of insulin pump therapy and recurrent diabetic keto-acidosis despite all efforts to avoid it
- with eating disorders (in highly selected cases)
- and other chronic illness, eg, coeliac disease
- variable or prolonged insulin action.

Additional criteria state that patients, caregivers or parents must:

- have the patient on optimal conventional therapy
- monitor and record blood glucose a minimum of four times per day, and make appropriate adjustments
- be responsible and psychologically stable
- be willing to quantitate food intake, especially carbohydrate in the diet
- be willing to comply with medical/nursing follow-up
- be able to cope with and manage the technical challenges of the equipment
- have committed parental/caregiver supervision in diabetes care.

Continuous glucose monitoring systems

A clinical practice guideline for the use of continuous glucose monitoring was developed by the US Endocrine Society, and can be accessed here: www.guideline.gov/content.aspx?id=35254.



Implementation advice

Type 1 diabetes management and multidisciplinary team approaches

A NICE care pathway for people with type 1 diabetes can be found at: <http://pathways.nice.org.uk/pathways/diabetes>.

Insulin pumps and continuous glucose monitoring systems

According to the Ministry of Health Service Specification (2003):

‘The regional service must use a documented assessment process, and attempt first to maximise MDI. This may require continuous glucose monitoring (using interstitial glucose sensors). The regional service should support secondary hospital diabetes services where it is practicable to undertake this assessment remotely.

The service should include a detailed programme for pre-insulin pump assessment, implementation, support, and on-going review of patients on insulin pumps. The service should provide for a trial period of insulin pump therapy to suitable patients.

Personnel requirements include:

- a specialist diabetes physician/paediatrician with experience in the selection and supervision of patients on insulin pumps
- a diabetes nurse specialist trained in continuous glucose monitoring and insulin pump therapy
- a specialist dietician with experience in providing appropriate dietary education for patients planning to use insulin pumps’ (p 2).

Reporting requires that for each referral the service must maintain a register that includes:

- the NHI and patient demographics including ethnicity,
- the indications for referral (using the referral criteria in this service specification),

- the report and outcome from an assessment using continuous glucose monitoring (if applicable)
- the final treatment (including optimised MDI, insulin pump, other specific treatment modalities, or assessment and treatment not completed) (p 3).

The **Australian Clinical Guidelines for Management of Type 1** (2011) suggests that individuals who may be likely to benefit from CSII pump therapy, as part of intensive diabetes management, are:

- some children and adolescents, including infants and young children, and pregnant women (ideally preconception)
- individuals with microvascular complications of diabetes
- individuals with reduced hypoglycaemia awareness
- individuals (or their supervising adults) with desirable motivational factors; for example, those seeking to improve blood glucose control and having realistic expectations
- individuals exhibiting desirable CSII treatment-related behavioural factors, including those who:
 - are able to perform carbohydrate counting
 - are currently undertaking four or more blood glucose tests per day
 - have reliable adult supervision (in paediatrics), and a history of good self-management skills (in adults)
 - are able to master the technical skills of CSII
 - are reliable in follow-up health care.

The UK's **NICE** guidelines state that continuous subcutaneous insulin infusion or insulin pump therapy is recommended as a possible treatment for adults and children 12 years and over with type 1 diabetes mellitus if:

- attempts to reach target HbA1c levels with multiple daily injections result in the person having 'disabling hypoglycaemia', or
- HbA1c levels have remained high (69 mmol/mol or above) with multiple daily injections (including using long-acting insulin analogues if appropriate) despite the person and/or their carer carefully trying to manage their diabetes.

Insulin pump therapy is recommended as a possible treatment for children under 12 years with type 1 diabetes mellitus if treatment with multiple daily injections is not practical or is not considered appropriate. Children who use insulin pump therapy should have a trial of MDI when they are between the ages of 12 and 18 years.

Insulin pump therapy should only be started by a trained specialist team. This team should include a doctor who specialises in insulin pump therapy, a diabetes nurse and a dietitian (someone who can give specialist advice on diet). This team should provide structured education programmes and advice on diet, lifestyle and exercise that is suitable for people using insulin pumps.

Insulin pump therapy should only be continued in adults and children 12 years and over if there has been a sustained improvement in the control of their blood glucose levels. This should be shown by a decrease in the person's HbA1c levels or by the person having fewer hypoglycaemic episodes. Such goals should be set by the doctor through discussion with the person or their carer.



Implementation examples / innovations

Type 1 diabetes management and multidisciplinary team approaches



The Type 1 Diabetes (T1D) Exchange Clinic Registry

This is a large scale study of children and adults with type 1 diabetes in the United States. Twenty-five thousand people have been enrolled and results have been published since 2013. A study of adults with type 1 diabetes of at least two years duration and not using continuous glucose monitoring compared those with excellent control (HbA_{1c} <48, N=627) and fair/poor control (HbA_{1c} >69, N=1267). Results showed that excellent control was associated with higher socioeconomic status; being older and married; not being overweight; frequent exercise; lower total daily insulin dose per kg; more frequent monitoring of blood glucose; administering mealtime boluses prior to rather than at or after eating; monitoring before giving a bolus and missing an insulin dose less frequently. Frequency of severe hypoglycaemia was similar for both groups but diabetic ketoacidosis was more common for those with poorer control (Simmons et al 2013).

Insulin pumps and continuous glucose monitoring systems



Starship Children's Health

Starship Children's Health runs an insulin pump programme which is summarised in a pdf, a link to which can be found here: <https://www.starship.org.nz/patients-and-families/directory-of-services/Diabetes-and-Endocrinology/>

Following consultation with a diabetes consultant around eligibility for pump therapy, the programme supports individuals and their families/whānau through:

- access to a pump (PHARMAC or self-funded)
- application for authority
- education on the pump and how it works
- dietary advice
- filling prescriptions for pump, consumables and insulin
- pump training (two half-days and a one-hour follow-up a week later)
- daily contact with diabetes team for up to a fortnight
- download pump weekly
- 3–4 monthly clinic follow-ups.



Clinical impact of insulin pump therapy

To examine the clinical impact of insulin pump therapy for children with type 1, de Bock et al (2010) conducted a retrospective analysis of a six-year cohort of children from the Starship paediatric diabetes database compared with the whole T1DM population and with an equal number of non-pump patients matched by age, sex, ethnicity and duration of diabetes. From the total group of 621 children, 75 were started and remained on pump therapy for 12 months. From their comparison the authors concluded that ‘in a pump-naïve regional paediatric population, insulin-pump therapy for T1DM was safe and effective, and associated with sustained improvements in HbA1c and lower risk of hypoglycaemia’.



Waikato District Health Board

A Waikato study (Reda et al 2007) compared HbA1c levels for a group of people with type 1 before and after the introduction of pump therapy. No comparison group was used and the data consisted of 105 individuals on continuous subcutaneous insulin infusion (CSII) at the time of the study. A significant improvement in HbA1c was found with an average reduction of 1%, which was maintained at three years. The incidence of severe hypoglycaemia reduced from 0.75 cases per patient year during multiple daily injections (MDI) pre-pump to 0.05 during CSII. Hypo awareness was restored for some individuals and there was no increase in diabetic ketoacidosis.



Assessment tools

Type 1 diabetes management and multidisciplinary team approaches

Structure

People with type 1 diabetes should have access to an experienced multidisciplinary team.

Process

- (a) The proportion of people with type 1 diabetes offered access to an experienced multidisciplinary team within the past 12 months.

Numerator	The number of people in the denominator recorded as being offered access to care from a multidisciplinary team in the past 12 months
Denominator	The number of people with type 1 diabetes

- (b) The proportion of people with type 1 diabetes receiving care from an experienced multidisciplinary team within the past 12 months.

Numerator	The number of people in the denominator receiving care from an experienced multidisciplinary team in the past 12 months
Denominator	The number of people with type 1 diabetes

Insulin pumps and continuous glucose monitoring systems

Structure

People with type 1 diabetes should have access to an experienced multidisciplinary team with expertise in insulin pump therapy and CGMS when required

Process

- (a) The proportion of people with type 1 diabetes using insulin pump therapy who would benefit from it in the past 12 months.

Numerator	The number of people in the denominator on insulin pump therapy in the past 12 months
Denominator	The number of people with type 1 diabetes who would benefit from insulin pump therapy

- (b) The proportion of people with type 1 diabetes using CGMS who would benefit from it in the past 12 months.

Numerator	The number of people in the denominator using CGMS in the past 12 months
Denominator	The number of people with type 1 diabetes who would benefit from using CGMS



Resources

The **Type 1 Diabetes Network** is an Australian organisation which provides information and support for people with type 1. They have produced an information Starter Kit for newly diagnosed individuals which is currently in its fourth edition.

‘The Type 1 Diabetes Network Starter Kit is the result of contributions from people living with type 1 diabetes in Australia. This document seeks to provide people newly diagnosed with type 1 a sense of what life is actually like on a day-to-day, 24/7 basis, including the good and bad; the funny and frightening; the reality and the myths. This document is intended to complement the information provided by health care professionals, diabetes organisations and other sources’ (p 3). It includes information on insulin pumps and can be accessed at: http://t1dn.org.au/wp-content/uploads/2013/11/StarterKit_Web_1312.pdf

PHARMAC’s information on insulin pumps can be accessed here:

www.pharmac.govt.nz/2012/08/08/2012-08-08%20Notification%20of%20Insulin%20pumps.pdf

A patient guide to continuous glucose monitoring has been developed by the US National Guideline Clearinghouse committee. It can be found here: www.hormone.org/patient-guides/2011/continuous-glucose-monitoring



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Standard 18

Vulnerable patients, including those in residential facilities and those with mental health or cognitive problems, should have access to all aspects of care, tailored to their individual needs.

Key practice points

- Standard 18 considers vulnerable persons as, but not limited to, the following: Māori and Pacific peoples, older adults, those in residential care facilities, those with mental/cognitive health issues, those requiring advanced care planning, individuals in prison, immigrants and refugees.
- Health care delivery and workforce development should be culturally appropriate (as determined by the individual or family/whānau).
- Participation to their fullest ability in decisions about their health and wellbeing is encouraged.
- Physical and mental health services should develop a closer alignment as mental health illness is often overlooked or misdiagnosed in people with intellectual disability.
- Decreased cognitive function and poor health literacy may result in less self-management capability.
- Offer individuals and their family/whānau the opportunity to discuss an end-of-life care plan, avoid unnecessary poly-pharmacy and consider de-escalation of treatment where appropriate.
- Access to diabetes care for people in prison should be available as per national standards.
- Immigrants or refugees often have high health needs and cultural and religious beliefs may impact on health care choices.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure that people with diabetes who are in vulnerable population groups have access to all aspects of care, tailored to their individual needs.

Health care professionals ensure they are competent to provide individually tailored care for people with diabetes who are in vulnerable population groups.

Planners and funders ensure services are commissioned that enable all aspects of care to be provided to people in vulnerable population groups, tailored to the individual.

Vulnerable people with diabetes receive all aspects of care, tailored to their individual needs.

Definitions

The term ‘vulnerable’ is broadly defined by the International Diabetes Federation (Williams et al 2006) as ‘the person, community or group is for some reason at increased risk of diabetes or is a victim of unforeseen circumstances that make their health situation precarious’(p 30).

Definitions for specific population groups are provided in the guidelines section below.



Introduction

Definitions for vulnerable people appear to be focused by topic or to be based on race or ethnicity, socioeconomic status, geography, gender, age, disability status, risk status related to sex and gender, cancer survivors, immigrants and refugees, incarcerated men and women, persons who use drugs, pregnant women and veterans (Centers for Disease Control and Prevention 2014). A further way of understanding vulnerable may be based on an analytical framework developed by CBG Health Research (2011) which considers the individual’s predisposition to health and health services, availability of services both geographically and across population groups, accessibility (distance and transport), accommodation (hours of operation of the service), affordability, acceptability (language, culture, gender, privacy) and appropriateness of the service. Additionally, vulnerable people may also encompass those ‘whose needs are not addressed by traditional service providers or who feel they cannot comfortably or safely access and use the standard resources offered’ (Central Cancer Network 2012). Thus vulnerable groups may encompass many different groups of people including Māori, Pacific peoples, older adults, the homeless, children (and those under or leaving Child Youth and Family Services’ [CYFS] care), pregnant women, those in rural areas, individuals in prison, inpatients, veterans, immigrants, refugees, those in residential care, individuals with mental/cognitive health issues, those with low literacy levels and individuals requiring advanced care planning.

In the context of Standard 18 a ‘vulnerable patient’ is a person with diabetes who falls into one or more of the following groups:

- Māori and Pacific peoples
- the older adult
- those in residential care facilities
- those with mental/cognitive health issues
- those requiring advanced care planning
- individuals in prison
- immigrants and refugees.



Guidelines

This section addresses guidelines related to: (1) Māori and Pacific peoples; (2) older adults and those in residential care; (3) mental health and cognitive problems; (4) advanced care planning; (5) prisons; and (6) immigrants/refugees. However, many of these sections are interrelated given that the literature suggests there are links between diabetes and cognitive impairment (Allen et al 2004; Roberts et al 2014); anticholinergics and cognitive impairment (Fox et al 2011); and diabetes and mental health conditions (Balhara 2011; Llorente et al 2006).

Māori and Pacific peoples

Māori have on average the poorest health statistics of any ethnic group in New Zealand and the government has made it a key priority to reduce these inequalities (Ministry of Health 2014). Harwood and Tipene-Leach (2007) suggest 'For no other disease are significant health inequalities more obvious than when we look at diabetes' (p 162). Diabetes is almost three times more common in Māori than non-Māori. In addition, for Māori aged 45–64 years death rates due to diabetes are nine times higher than for non-Māori New Zealanders of the same age. Māori are diagnosed younger and are more likely to develop diabetic complications such as eye disease, kidney failure, strokes and heart disease.

According to the Ministry of Health, access to health care is reduced for Māori. Cost prevented 23% of Māori adults, and 8% of Māori children from visiting a GP when they needed to in the past 12 months whilst many Māori adults (18%) and children (12%) did not collect a prescription item in the past 12 months due to the costs (Ministry of Health 2013a). Health literacy may also be an issue as shown in the recent Māori health literacy research into gestational diabetes (Ministry of Health 2014) and it is a barrier to understanding and managing gestational diabetes which is a precursor to type 2 diabetes.

New Zealand's health context is unique in that health inequalities between Māori and non-Māori can be held to redress in part by New Zealand's founding document, The Treaty of Waitangi. As controversial as the Treaty is, part of its obligations is to provide equality. Within the health context Māori should be able to enjoy the same health and wellbeing as non-Māori and Māori health interests are protected. Additionally, Māori should have equal access to appropriate health services (Kingi 2007). This also fits with the Health Quality and Safety Commission (HQSC) of New Zealand's Triple Aim Strategy.

Examples of government strategies that are trying to address health inequalities are the implementation of the He Korowai Oranga: Māori Health Strategy (Ministry of Health 2014); the Māori health provider development scheme, Māori hauora/health scholarships; promotion of Māori health models; District Health Board (DHB) Māori Health Plans; Whānau Ora programmes and funding rongoā Māori in some areas.

Some helpful recommendations for working with Māori with diabetes can be found in the booklet prepared for the Medical Council of New Zealand by Mauri Ora Associates – *Best health outcomes for Māori: Practice implications*. It can be accessed at: <https://www.mcnz.org.nz/assets/News-and-Publications/Statements/Best-health-outcomes-for-Maori.pdf>.

According to Foliaki and Pearce (2003), diabetes prevalence has increased rapidly over time in the indigenous people of the Pacific region (Polynesian, Melanesian, Micronesian), both in the Pacific islands and in countries such as New Zealand, and Pacific people experience greater morbidity and more complications than people of European descent with diabetes. This was confirmed by Statistics New Zealand based on 2002–2004 data, which stated the incidence of cardiovascular disease, diabetes, and respiratory illness is significantly higher among Pacific peoples than other ethnic groups. In addition, type 2 diabetes occurs earlier in Pacific peoples, about 10 years before New Zealand Europeans (NZE), including a growing number of children and adolescents. Young people with type 2 diabetes are at greater risk of morbidity and mortality (Constantino 2013).

In the 2013 report on the Adult Nutrition Survey, Coppel et al found that diabetes was prevalent among Māori and Pacific peoples, and particularly high among Pacific peoples. One-third or more of Pacific peoples aged 45 years and over had diabetes. Age-specific rates of undiagnosed diabetes were highest among Pacific peoples, for whom the ratio of diagnosed to undiagnosed diabetes was 5:4 compared with 10:3 for Māori and 10:1 for NZE. The highest prevalence of diabetes was observed among Pacific peoples, with rates among Māori in between that observed for Pacific peoples and the NZE groups. Rates increased with age with the highest prevalence observed for those aged 75 years and over.

Some helpful recommendations for working with Pacific peoples with diabetes can be found in the booklet prepared for the Medical Council of New Zealand by Mauri Ora Associates – Best health outcomes for Pacific peoples: Practice implications. It can be accessed at: www.mcnz.org.nz/assets/News-and-Publications/Statements/Best-health-outcomes-for-Pacific-Peoples.pdf.

The report *Primary care for Pacific people: A Pacific and health systems approach* (Southwick et al 2012) presents evidence to support improvements in primary care delivery to Pacific peoples. The full document is available here: www.pacificperspectives.co.nz/primary-health-research.html or here: www.health.govt.nz/publication/primary-care-pacific-people-pacific-and-health-systems-approach.

Older adults and residential care

The definition of an ‘older adult’ is not clear as it can be based on chronological or functional age. ‘Older adults’ may be those over the age of 65 but this can be further broken down into the ‘young old’ under 75 and the ‘old old’ over 75. Additionally a distinction may be made between ‘healthy’ older adults (those who are aging but are in sound physical and mental health) and ‘frail’ older adults (those with comorbidities or physical, mental or emotional disability which compromises management of diabetes)’ (Australian Diabetes Educators Association 2003).

The Ministry of Health has produced the *Health of Older People Strategy* (2002). This document sets out the vision and eight objectives for the care of older adults aged 65 and over.

Guidelines for care of the older adult with diabetes are important because older people are more likely to have comorbidities which complicate management of diabetes (Australian Diabetes Educators Association 2003) and available guidelines often make little or no reference to this age group (Australian Diabetes Educators Association 2003; International Diabetes Federation 2013). Several organisations have developed diabetes guidelines specific to, or including, older adults (see below). The overriding message related to care of the older adult with diabetes is treat the patient not the HbA1c (McLaren et al 2013).

Older adults

A statement released by the International Association of Gerontology and Geriatrics (IAGG), the European Diabetes Working Party for Older People (EDWPOP), and the International Task Force of Experts in Diabetes (Sinclair et al 2012) provides consensus statements across eight domains covering glucose targets, influence of comorbidities, patient safety, hypoglycaemia, therapy, diabetes in care homes, diabetes education and family/whānau/carer perspectives pertinent to those aged 70 and over.

The **American Diabetes Association** (ADA) includes a section on older adults in its annual Standards of Medical Care in Diabetes – 2014 (American Diabetes Association 2014b). This section provides recommendations and a framework for considering treatment goals for glycaemia, blood pressure and dyslipidaemia in older adults with diabetes.

The **International Diabetes Federation** (IDF) (2013) guidelines for managing older people with type 2 diabetes provides extra detail for consideration when working with this group of people. The guidelines are designed for those aged 70+ and are also considered applicable for those with type 1 diabetes. The guidelines are based on expert consensus and clinical expertise but may not be useful for all older adult populations in New Zealand because of a lack of consideration for the needs of Māori and Pacific peoples. However the key message that older people are highly individual and their needs can differ dramatically is pertinent to New Zealand.

The Australian Diabetes Educators Association (2003) provides best practice standards for the diagnosis and care of older people in Australia with diabetes.

A New Zealand position statement produced by the **New Zealand Medical Association** (NZMA nd) provides 17 principles specific to care of older adults.

Residential care

Residential care includes long term care provided by rest homes, continuing care (hospital), dementia care units and specialised hospital care units (psycho-geriatric care) for individuals aged over 65; or aged between 50 and 64, unmarried and with no dependent children (Ministry of Health 2014). Younger persons may also be receiving care in residential facilities via disability services.

Older adults in residential care – the consensus statement from the International Association of Gerontology and Geriatrics (IAGG), the European Diabetes Working Party for Older People (EDWPOP), and the International Task Force of Experts in Diabetes (Sinclair et al 2012) pertinent to caring for individuals with diabetes in residential care suggests major aims for care for these individuals should be individualised care, prevention of hypoglycaemia, avoidance of acute metabolic complications, reducing risk of infection, prevention of hospitalisation and introduction of timely end-of-life care.

For examples of guidelines specific to care of older adults with diabetes in residential care refer to:

- New Zealand residential care – Diabetes care for aged residential care facilities in Hawkes Bay (Diabetes Clinical Advisory Group 2012)
www.healthhb.co.nz/wp-content/uploads/2012/11/Diabetes-Care-for-Aged-Residential-Care-Facilities-in-Hawkes-Bay-2012-Reference-Book.pdf
- United Kingdom residential care – *Good clinical practice guidelines for care home residents with diabetes* (Diabetes UK 2010)
www.diabetes.org.uk/Documents/About%20Us/Our%20views/Care%20recs/Care-homes-0110.pdf

- Canadian residential care – Diabetes guidelines for elderly residents in long term care (LTC) facilities and the frail elderly (Diabetes Care Program of Nova Scotia 2010)
<http://diabetescare.nshealth.ca/sites/default/files/files/LTCBackground2010.pdf>.

Mental health or cognitive problems

Mental health

Mental health is defined as a state of wellbeing in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community (World Health Organization 2013). Mental illness refers to a wide range of mental health conditions affecting mood, thinking and behaviour (such as depression, anxiety disorders, schizophrenia, eating disorders and addictive behaviours) (Mayo Foundation for Medical Education and Research 1998–2014).

Cognitive problems

Cognition relates to or involves conscious mental activities (such as thinking, understanding, learning and remembering) (Merriam-Webster 2014). Cognitive impairment or disability is difficult to define but the implication is that persons with cognitive impairment or disability may have difficulty with various types of mental tasks (Center for Persons with Disabilities nd; Disabled World nd). Cognitive impairment or disability arises from physiological or biological processes (genetic disorder, traumatic brain injury). Cognitive disability may be described as a clinical diagnosis (eg, Down syndrome, traumatic brain injury, autism, dementia, dyslexia, Attention Deficit Disorder, dyscalculia) or from a functional perspective (eg, difficulties or deficits involving problem solving, attention, memory, math comprehension, visual comprehension, reading, linguistic and verbal comprehension) (Center for Persons with Disabilities nd; Disabled World nd).

The literature suggests there is evidence to support the view that people with diabetes have increased risk of developing cognitive impairment (Allen et al 2004; McCrimmon et al 2012) and that cognitive impairment is associated with poor diabetes control (Munshi et al 2006).

Documents relating to mental/cognitive health have a focus on mental health (Ministry of Health 2009) or disability (Te Pou o Te Whakaaro Nu: The National Centre of Mental Health Research Information and Workforce Development 2013). However, it appears that for both broad groups there is a common theme that suggests closer alignment of physical/mental services is required because mental health issues are often missed or treated inadequately in these groups of people.

The Ministry of Health (2009) document ‘Towards optimal primary mental health care in the new primary care environment: A draft guidance paper’ is a guidance document which addresses vulnerable populations with mental health conditions. The key message relates to primary mental health services taking a targeted approach to meeting the needs of these groups and highlights ‘that there are currently major gaps in primary mental health service provision for children and youth, Pacific peoples, migrant and refugee peoples, and patients with alcohol and/or other drug problems. These gaps, along with sustained effort on meeting the mental health needs of Māori, should be priority areas for future service development’ (Ministry of Health 2009, p 76).

It is also suggested that comorbid health problems are being missed or not treated adequately (ie, depression, metabolic syndrome resulting from treatment with antipsychotic medication) (Ministry of Health 2009). The Ministry of Health highlights that for older adults mental health and addiction problems are often undetected, untreated and individuals are not referred to appropriate services. This often leads to poly-pharmacy which is problematic because of drug interactions arising from physiological changes in the elderly.

Advanced care planning

The focus of advanced care planning or end-of-life care can be viewed from two perspectives: those of the individual and family/whānau planning for end-of-life care and health care professionals involved in end-of-life care for an individual. Resources for individuals about advanced care planning are included in the resource section.

The International Diabetes Federation provides a rationale and evidence base for the care of individuals at the end of their life. Individuals at the end of life are characterised by a significant medical illness or malignancy and have a life expectancy reduced to less than one year. Recommendations reflect compromised self-care (fatigue, drowsiness from medicines), the need for pain relief, avoiding dehydration, withdrawal of treatment, and a raised threshold for investigation. Goals of care are often very different from other categories. These individuals typically require significant health care input and specific diabetes care may not necessarily be the most important priority. However, diabetes care remains important to manage symptoms, comfort, and quality of life (International Diabetes Federation 2013).

There does not appear to be one overarching guideline regarding advanced care planning pertaining specifically to diabetes for New Zealand. However, a number of different sources specific to New Zealand are available around end-of-life or advanced care planning and include:

- Best Practice Advocacy Centre (BPAC) NZ (2006) *Providing Palliative Care to Māori* available at: www.bpac.org.nz/resources/campaign/palliative/palliative_Maori.asp
- BPAC NZ (2011) Treatment for the dying patient: *The Liverpool Care Pathway* available at: www.bpac.org.nz/BPJ/2011/june/lcp.aspx
- BPAC NZ (2011) End-of-life care for patients with chronic disease: The need for a paradigm shift available from: www.bpac.org.nz/BPJ/2011/november/end-of-life.aspx
- Hospice NZ Standards for Palliative Care (2012). The purpose of this document is to ensure the best possible care for all people in New Zealand as they approach the end of their life and die. Available here: www.southerncancernetwork.org.nz/file/fileid/45559.

Individuals in prison

All prisons provide primary health care to prisoners, with secondary and tertiary health care provided by the local DHB. Prisoners are referred by prison health services under the same eligibility criteria as any other member of the public (Department of Corrections nd).

The American Diabetes Association (ADA) has a position statement about diabetes management in correctional institutions (American Diabetes Association 2014a). This document covers management plans from intake to discharge and includes nutrition and food services, urgent and emergency issues, medication, monitoring and screening for complications, education for both inmates and staff, alcohol and drugs, transfer and discharge, information sharing, children and adolescents, and pregnancy.

Immigrants and refugees

As there does not appear to be an overarching guideline for care of immigrants and refugees with diabetes specific to New Zealand, all immigrants or refugees should receive care for their diabetes as per national standards.

Immigrants and refugees have different experiences of arriving in New Zealand. Immigrants choose to leave their homeland and resettle whereas refugees do not choose to leave their homeland, rather they flee in response to a crisis (Ministry of Health 2012). These differences in reasons for coming to New Zealand may give rise to different health needs. Additionally, many of these people (particularly refugees) will have had vastly different experiences of health care in their country of origin.

Although not specific to the care of diabetes in these groups, two documents are available that provide additional information.

The Ministry of Health (2012) has developed a handbook about refugee health care providing background to the countries of origin for many refugees in New Zealand, main areas of resettlement, considerations for a consultation with a refugee, common issues in physical health care, mental health issues, considerations for refugees with special health and disability needs, a contact list and additional information.

A Canadian document with recommendations for the health care of immigrants and refugees, Evidence based clinical guidelines for immigrants and refugees (2011), covers infectious diseases, chronic and non-communicable diseases, women's health and knowledge translation.



Implementation advice

Māori and Pacific peoples

‘The degree of comfort individuals feel with seeking health services impacts on their use of services and in turn health outcomes ... The delivery of care in a culturally appropriate manner is an important element in determining both the willingness of people to access services and the success of any treatment or care then delivered’ (Durie 2001 in Mauri Ora Associates 2008, p 12).

Health care professionals must consider their own attitude, awareness, knowledge, and skills before any health care interactions with individuals, family/whānau.

Developing the Māori workforce across the spectrum of service providers and disciplines is essential in order for services to provide appropriate care to Māori individuals, their whānau and all New Zealanders (Ministry of Health 2013). In 2012, there were 77,929 Māori students studying in tertiary institutions in New Zealand. Of these 12,116 (15.5%) students were enrolled in health related subjects with 2285 (18.9%) students completing their health-related qualification in that year. Durie (2003) supports increasing the indigenous workforce and discusses pertinent points when looking at workforce issues for Māori. For example, if the doctor and patient are from different cultural backgrounds there is a greater likelihood of non-compliance and misdiagnosis. Furthermore Durie (2003) recommends giving priority to developing an indigenous health workforce that has both professional and cultural competence including adopting indigenous health perspectives such as spirituality into conventional health services. Emphasis should also be given to self-determination and autonomy.

Additionally, consideration must be given to the Māori worldview, cosmology and tikanga; concepts of whānau, tapu, and noa; and holistic views of health (Mauri Ora Associates 2008). Some helpful recommendations for treating Māori with diabetes can be found in the booklet prepared for the Medical Council of New Zealand by Mauri Ora Associates *Best health outcomes for Māori: Practice implications*. It can be accessed at: <https://www.mcnz.org.nz/assets/News-and-Publications/Statements/Best-health-outcomes-for-Maori.pdf>.

An article describing Māori models of health to promote the health of Māori can be accessed here: www.hauora.co.nz/resources/Hauora%20KeepinguptoDate3-09.pdf.

Consideration must be given to the worldview of Pacific peoples, and the specific cultural preferences of the individual and family/whānau. Important aspects are relationships, family, community and environment; holistic health and spirituality; contribution and responsibility; correctness and respect; faith, integrity and dignity (Mauri Ora Associates 2010). Some helpful recommendations for working with Pacific peoples with diabetes can be found in the booklet prepared for the Medical Council of New Zealand by Mauri Ora Associates *Best health outcomes for Pacific peoples: Practice implications*. It can be accessed at: www.mcnz.org.nz/assets/News-and-Publications/Statements/Best-health-outcomes-for-Pacific-Peoples.pdf.

Examples of government strategies that are trying to address health inequalities are the implementation of the He Korowai Oranga: Māori Health Strategy (Ministry of Health 2014); the Māori health provider development scheme, Māori hauora/health scholarships; promotion of Māori health models; DHB Māori Health Plans; Whānau Ora programmes and funding rongoā Māori in some areas.

The report *Primary Care for Pacific People: A Pacific and health systems approach* (Southwick et al 2012) presents evidence to support improvements in primary care delivery to Pacific peoples. The full document is available here: www.pacificperspectives.co.nz/primary-health-research.html or here: www.health.govt.nz/publication/primary-care-pacific-people-pacific-and-health-systems-approach. Below is a summary of recommendations from pages 14–18:

1. Require public funded primary care organisations to provide appropriately anonymous data for quality improvement, accountability and achievement of Better Sooner More Convenient Care (BSMC) health services for Pacific people.
2. Improve consistency in the application of capitation funding at primary health organisation (PHO) and practice level so as to achieve a population health approach which includes targeting enrolled patients with high health needs and service delivery models based on a primary care team approach. Many practices are still operating a fee-for-service regime internally.
3. Improve the use of ethnicity data. Despite near universal collection of data, there is very little analysis or use of this information to improve quality of health services and to determine who is not accessing services. Mandatory reporting of service provision and outcomes by ethnicity would be one mechanism to address health equity.
4. In locating primary care provision, the availability of public and/or private transport is a key factor affecting Pacific peoples' access to primary care.
5. Require improved appointment system approaches in order to deliver Better Sooner More Convenient Care to Pacific peoples. This will generally mean practices actively managing a balance between consultations with and without pre-arranged appointments, and flexible length of consultation and appointment times.

6. Implement strategies that derive advantage from the clustering of Pacific peoples by area of residence and by practices they choose to attend. This clustering can facilitate delivery of local solutions within these clusters to target high needs groups requiring chronic care management.
7. Support cultural competence across the health services workforce and training for health professionals in family/whānau based approaches to health and wellbeing.
8. Pacific health workers make a significant contribution to Pacific health improvement, in frontline roles offering language and cultural skills and at every level of the health system providing insights into the realities of the health system and of Pacific world views. Pacific Health and Disability Workforce Development Plan has been a key resource for supporting Pacific workforce participation at all levels of the health system. This support should be continued.
9. Development of policy for translation services and approaches to support effective communication between Pacific peoples and health care providers is required to address this complex topic.
10. Further investment in the development of ethnic-specific research methodologies to promote intercultural understanding and enhance the richness and knowledge of diverse populations within the New Zealand context.

Older adults and residential care

Vision and eight objectives taken from the Ministry of Health (2002) Health of Older People strategy:

- Older people participate to their fullest ability in decisions about their health and wellbeing and in family, whānau and community life. They are supported in this by coordinated and responsive health and disability support programmes.
- Older people, their families and whānau are able to make well-informed choices about options for healthy living, health care and/or disability support needs.
- Policy and service planning will support quality health and disability support programmes integrated around the needs of older people.
- Funding and service delivery will promote timely access to quality integrated health and disability support services for older people, family, whānau and carers.
- The health and disability support needs of older Māori and their whānau will be met by appropriate, integrated health care and disability support services.
- Population-based health initiatives and programmes will promote health and wellbeing in older age.
- Older people will have timely access to primary and community health services that proactively improve and maintain their health and functioning.
- Admission to general hospital services will be integrated with any community-based care and support that an older person requires.
- Older people with high and complex health and disability support needs will have access to flexible, timely and coordinated services and living options that take account of family and whānau carer needs.

Specific to diabetes care, treat the individual not the HbA1c. Guidelines and commentary around the care of the elderly or frail living with diabetes at home or in residential care suggest individualised care plans are imperative when treating diabetes (Diabetes UK 2010). Essential components of the individualised plan are that it maximises quality of life, avoids unnecessary medical and therapeutic interventions and provides support and opportunity for self-

management where feasible (Diabetes Clinical Advisory Group 2012; Diabetes UK 2010). Additionally, the individualised care plan should consider the individual's ability to self-manage, their cognitive status, comorbidities, risk of hyper/hypoglycaemia and life expectancy (Diabetes UK 2010; Mallery 2009; McLaren et al 2013).

Key messages contained in the International Diabetes Federation (IDF) guidelines:

- Prevention through proactive risk assessment, screening and ongoing assessment.
- Planned individualised care based on an individual's functional status (mental and physical competence).
- The need for more frequent assessment – 'Older people do very well until something goes wrong, and then they often deteriorate suddenly, so those assessments might need to be more frequent than the annual ones we normally do' (Dunning, accessed at www.medscape.com/viewarticle/817705).
- Medication management – reducing unnecessary poly-pharmacy and hyper/hypoglycaemia and prevention of other adverse events (such as falls).
- Referral to geriatricians or doctors/nurses skilled in the care of the elderly with diabetes.
- Involvement of a multidisciplinary team.

These guidelines also include decisions such as when to stop driving and end-of-life care planning.

The following framework for considering treatment goals for glycaemia, blood pressure and dyslipidaemia in older adults with diabetes is taken from the American Diabetes Association position statement (ADA 2014b). Note that this represents a consensus framework for considering treatment goals for glycaemia, blood pressure, and dyslipidaemia in older adults with diabetes. The patient characteristic categories are general concepts. Not every patient will clearly fall into a particular category. Consideration of patient/caregiver preferences is an important aspect of treatment individualisation. Additionally, a patient's health status and preferences may change over time. A lower HbA_{1c} goal may be set for an individual if achievable without recurrent or severe hypoglycaemia or undue treatment burden. Coexisting chronic illnesses are conditions serious enough to require medications or lifestyle management and may include arthritis, cancer, CHF, depression, emphysema, falls, hypertension, incontinence, stage 3 or worse CKD, MI, and stroke. By multiple, we mean at least three, but many patients may have five or more.

- **Healthy patient** with few existing chronic illnesses, intact cognitive and functional status, and longer remaining life expectancy: Reasonable HbA_{1c} goal <58 mmol/mol; Fasting or preprandial glucose 5–7.2 mmol/L; bedtime glucose 5–8.3 mmol/L; blood pressure <140/80 mmHg; lipids – statin unless contraindicated or not tolerated.
- **Complex/intermediate patient** with multiple coexisting chronic illnesses or 2+ instrumental activities of daily living impairments or mild to moderate cognitive impairment, and intermediate life expectancy, high treatment burden, hypoglycaemia vulnerability and fall risk: Reasonable HbA_{1c} goal <64 mmol/mol; Fasting or preprandial glucose 5–8.3 mmol/L; bedtime glucose 6.1–11.1 mmol/L; blood pressure <140/80 mmHg; lipids – statin unless contraindicated or not tolerated.
- **Very complex patient/poor health** with long term care or end-stage chronic illnesses* or moderate-to-severe cognitive impairment or 2+ ADL dependencies and limited life expectancy making benefits uncertain: reasonable HbA_{1c} goal <69 mmol/mol[†]; fasting or preprandial glucose 5.5–10 mmol/L; bedtime glucose 5–8.3 mmol/L; blood pressure <150/90 mmHg; lipids – consider likelihood of benefit with statin (secondary prevention more so than primary).

- * The presence of a single end-stage chronic illness such as stage 3–4 CHF or oxygen dependent lung disease, CKD requiring dialysis, or uncontrolled metastatic cancer may cause significant symptoms or impairment of functional status and significantly reduce life expectancy.
- † A1C of 69 mmol/mol (8.5%) equates to an eAG of ~200 mg/dL. Looser glycaemia targets than this may expose patients to acute risks from glycosuria, dehydration, hyperglycaemic hyperosmolar syndrome, and poor wound healing.

NB. Adaptations to A1C goal from % to mmol/mol were taken from NZSSD (2011) HbA1c conversion tables available here:

www.nzssd.org.nz/HbA1c/4.%20HbA1c%20unit%20conversion%20table%20NZSSD%20Sept%202001.pdf.

Mental health or cognitive problems

The Ministry of Health (2009) suggest the following as key primary health service requirements for older people:

- Give greater attention to detecting and treating mental health and substance use problems among older adults in primary care, particularly those with chronic health problems.
- Be sensitive to the possibility that falls in older adults may be the result of AOD problems.
- PHOs, Integrated Family Healthcare Centres (IFHCs) and other primary health care organisations have contracts for packages of care with non-governmental organisations (NGOs) specialised in mental health and addiction treatment for older people.
- Potentially give lower doses of drug medications (according to best clinical practice) and monitor adverse side-effects more closely (BPAC 2008).
- Assess and promote good mental health for carers of older adults.
- Use a range of mental health screening measures with older primary care patients, including abbreviated versions of the following: Geriatric Depression Scale (GDS), Patient Health Questionnaire (PHQ), Beck Depression Inventory (BDI), General Health Questionnaire (GHQ), Center for Epidemiological Studies Depression Scale (CES-D) and Beck Anxiety Inventory – Primary Care (BAI-PC). The GDS, GHQ and CES-D have been validated with different ethnic groups and are available in multiple languages.

Based on the Ministry of Health's (2009) guidance on primary mental health care document, Cosgriff (2009) makes a number of recommendations for improving outcomes for people who have developed metabolic syndrome or have increased cardiovascular risk as a result of being on antipsychotic medication. These include:

- early cardiovascular risk assessment by either the mental health clinician or GP
- routine monitoring programme for all patients prescribed antipsychotics according to established guidelines (eg, those set by the National Mental Health Metabolic Working Group in 2006). The National Institute for Health and Care Excellence (NICE) guidelines on schizophrenia recommend that primary care is best placed to monitor and manage the physical health needs of these patients (NICE 2002)
- intervention programmes which are specially tailored to meet the needs of people with long term mental disorders and can be accessed from either primary care or secondary mental health services
- clear roles and responsibilities of the primary care and mental health practitioners with respect to patients' total health care
- opportunities for further education and professional development about the clinical issues, implications, and available interventions.

Intellectual disability

Closer alignment of physical and mental health services is recommended as mental illness is commonly overlooked or misdiagnosed in people with intellectual disability. The Ministry of Health (2009, p 69) proposes the following as key primary mental health service requirements for people with disabilities. While focused on primary mental health services these requirements are also relevant to primary health care practitioners.

- Primary health care practices are set up to enable people with disabilities easy access to the service, including:
 - physical access, eg, ramps
 - format of health information, eg, provision of information in Braille, easy-read, or highly visual format
 - access to sign language and interpreting services.
- Primary mental health practitioners should have a broad understanding of disability issues.
- Primary mental health practitioners are skilled in detecting depression and other mental health and/or substance use problems in people with disabilities; and in undertaking mental health screening for people with disabilities.
- Primary mental health practitioners monitor people who have a disability and a mental health and/or substance use disorder closely.
- There is more collaborative care and integration between primary health care, specialist mental health and disability services.
- There is better coordination of care for patients who have co-morbid disabilities and mental health or substance use disorders.
- Primary mental health practitioners are skilled in linking service users with disability support services.

Advanced care planning

Older people participate to their fullest ability in decisions about their health and wellbeing and in family, whānau and community life (Ministry of Health 2002).

Early discussion with an individual about their end-of-life care plan. The aim of a palliative approach and proactive documentation of end-of-life care is to promote comfort, control distressing symptoms including pain, hypo- and hyperglycaemia and preserve dignity. General recommendations from International Diabetes Federation (2013, p 81).

Individuals in prison

The key recommendation from the ADA position statement on diabetes management in correctional facilities is that people with diabetes in prison should receive care that meets national standards. Incarceration does not change the standards (American Diabetes Association 2014a).

Follow-up on recommendations/actions being taken by the Department of Corrections as identified in the Chief Ombudsman's report of 2012: the document *Investigation of the Department of Corrections in Relation to the Provision, Access and Availability of Prisoner Health Services* (Chief Ombudsman Beverly Wakem and Ombudsman David McGee 2012) identifies that although prisoners have reasonable access to health services and in general they receive health care equivalent to members of the public, there were problems with the service and in the future the service may not be able to meet the needs of this group of people. The

Department of Corrections states it is working with the Royal New Zealand College of General Practitioners to establish an accreditation process.

Immigrants and refugees

Health care for this group needs to take into consideration that:

- health care for these persons should be individualised
- extra consultation time will be required
- services of a professional interpreter may be required
- clear communication is imperative to avoid miscommunication
- cultural and religious diversity must be considered
- health care professionals should be aware that an individuals' cultural and religious beliefs and practices may impact on health care choices (Ministry of Health 2012).

Mortensen's (2011) publication suggests that while it is understood that refugees have high health and social needs, New Zealand has not yet developed 'institutional means to include this diverse ethnic group in policy, strategy and service planning' (p 1). Mortensen breaks findings from her study about responsiveness in the New Zealand public health system into three sections: responsiveness at national, regional and local levels. The study revealed that at a local level there are some signs of activation in the health sector, but that overall the 'opportunity structures' in the public health system are restricted. The services that were available to refugees had developed in response to health providers identifying health needs and initiating specific projects to address these locally. Many such projects had been funded through voluntary fundraising, charitable grants, or out of baseline health agency budgets. These activities are significant because they signal potential openings in the health structure for accommodating refugee groups and their ethnic communities. However, what is required to achieve a more responsive public health system are national changes to the ethnicity classification system used in health, an overarching framework for addressing cultural diversity, and the instruments and resources (such as policy and funding formulas) that recognise high needs in refugee groups (Mortensen 2011, p 10). It is unclear from the development of this standard whether or not these issues have been addressed or improved.

Although older, a further document (Henderson 2004) suggests that language is the most frequently identified barrier for immigrants in relation to seeking access to health care and services, and post-migration discrimination, underemployment and unemployment which are related to anxiety, depression and other health problems. Elderly immigrants and their families are often in particular need of support and there remains a need for culturally appropriate social services, social support and health services.



Implementation examples / innovations

Māori and Pacific peoples



Government strategies

Examples of government strategies that are trying to address health inequalities are the implementation of the He Korowai Oranga: Māori Health Strategy (Ministry of Health 2014); the Māori health provider development scheme, Māori hauora/health scholarships; promotion of Māori health models; DHB Māori Health Plans; Whānau Ora programmes and funding rongoā Māori in some areas.



Tauranga DHB

In 2010, Te Puna Hauora a Māori Health unit at Tauranga Hospital identified a need for a Kaupapa Māori service to address the higher burden of cardiovascular and diabetes experienced by Māori. The objective was to effectively bridge the continuum from primary to secondary services and back again. The model of care integrates the principles and values of the primary care organisation which also guides staff behaviour to achieve the organisation's overall vision. Values encompass Whanaungatanga respect, Kotahitanga unity, Manaakitanga support, Tikanga/Kawa leadership, Wairuatanga spiritual values, Tangata whenua customs and beliefs, and Ngakau Pono commitment to patient needs. The Kaupapa nurse has access to the hospital IT systems, and is able to download discharge summaries, access clinical data, and document in patient files outlining a plan of discharge. Effective communication between the interdisciplinary team and the diabetes specialist nurse (DNS) is an important objective to ensure the patient has a seamless journey, from one level of care to the next.



MidCentral DHB

MidCentral Health has set up new outreach clinics to help Pasifika people. In July 2014, new outreach clinics were set up by the Central primary health organisation (PHO) to provide easy access to health services for Pasifika people in the MidCentral District Health Board (MDHB) region. With a Pasifika population of around 8000 people in the MidCentral Health Board (MDHB) area, the need for more targeted services was recognised by the Pasifika Health Service which set out to provide an easy access health service. These clinics are free for Pasifika patients and provide nursing assessments, health checks, health education and physical activity education. The clinics support and provide linkages to other health service providers in the region such as the Children's Eczema Service and specialist nursing services for people with long term conditions. The service is also available to provide ongoing support to Pasifika families to access GPs and hospital care. For more information go to: www.midcentraldhb.govt.nz/News/Pages/New-outreach-clinics-to-help-Pasifika.aspx#.

Older adults and residential care



Taranaki DHB

Project SPLICE has been initiated by Taranaki District Health Board to address the projected health needs of its older population and people who have a long term conditions such as cardiovascular disease, diabetes and respiratory disease. This paper outlines a structure that will, within currently available funding, on an evolutionary basis enable services to refocus around the needs of people with long term conditions and of older people as their health deteriorates. Key developments include: care clusters with care manager, GP, allied health, and home based support services (HBSS); district support and development unit. More information can be found at: <http://workforceinnovation.hiirc.org.nz/page/32350/project-splice-taranaki-dhb/?jsessionid=AB340EF9C66FA0FBD366B1E89EA8377C?contentType=1461§ion=18375>.



MidCentral DHB

A new innovative model of care that sees the implementation of the nurse practitioner role in the aged care sector is increasing access and reducing health care inequalities for older people in the community. This innovation was developed to support three Levin aged residential care facilities in response to a GP shortage in the MidCentral region. Health Workforce New Zealand funded the evaluation, which was completed by the University of Auckland. The innovation was a collaboration between Masonic Village, Enliven Presbyterian, Support Central, Central primary health organisation (PHO) and the MidCentral District Health Board (DHB). The nurse practitioner was a joint appointment for the aged facilities and the Health of Older Persons team in the Central primary health organisation (PHO). The nurse practitioner had weekly scheduled time in each facility and responded to acute clinical events as needed, as well as providing Health of Older Persons services through the PHO and responding to community referrals. The nurse practitioner worked in partnership with the GPs allocated to each facility. The nurse practitioner conducted activities at the facilities such as direct care including assessing residents' levels of health independence, ordering diagnostic tests, and prescribing and reviewing medications. The nurse practitioner also provided clinical leadership for aged residential care staff and effectively advanced the team's evidence-based practice. Further information is available at: <http://workforceinnovation.hiirc.org.nz/page/43138/nurse-practitioner-role-in-aged-care/?jsessionid=AB340EF9C66FA0FBD366B1E89EA8377C?section=18375>.



Waikato DHB

Waikato DHB's Older Persons and Rehabilitation Services has introduced a new service called Supported Transfer and Accelerated Rehabilitation Team (START), which provides intensive rehabilitation in patients' homes, enabling early seamless discharge and improved function in line with daily living.

The aim of START is to:

- provide and promote rehabilitation of patients in their home environment in collaboration with community therapy services and specialist geriatric medical care
- provide and coordinate continuing clinical assessment to recognise deterioration and need for change in nursing or medical treatment or hospital admission
- work collaboratively with long term care providers by supplying education and training to carers as appropriate and developing a care plan for long term use in the home

- provide and improve education to patients, carers and family
- undertake a collaborative and individualised programme of health promotion for each client. Particular emphasis is placed on the role of fitness and prevention of deconditioning.

More information is available here:

<http://workforceinnovation.hiirc.org.nz/page/32580/supported-transfer-and-accelerated-rehabilitation/;jsessionid=AB340EF9C66FA0FBD366B1E89EA8377C?contentType=1461§ion=18375>.

Mental health or cognitive problems



Primary/Secondary Mental Health and Addictions Demonstration Project

A Ministry of Health project team is working with mental health and addictions implementation teams in each of five demonstration sites (West Coast, Wairarapa, Canterbury, Midlands and Alliance Health Plus) to support implementation of their primary/secondary mental health and addictions integration initiatives and to facilitate the sharing of their experience with the sector. Areas of demonstration include:

- e-notes sharing
- specialist telephone advice to GPs
- more comprehensive primary/secondary integration.

See <http://workforceinnovation.hiirc.org.nz/page/32612/primary-secondary-mental-health-and-addictions/;jsessionid=AB340EF9C66FA0FBD366B1E89EA8377C?contentType=1461§ion=18375> for further information.



Te Pou o Te Whakaaro Nui

Te Pou o Te Whakaaro Nui initiative, Equally Well, is a collaborative project aiming to improve the physical health of individuals diagnosed with severe mental illnesses. The website provides an evidence review and infographic and other useful information and can be found here: www.tepou.co.nz/improving-services/physical-health.



Assessment tools

Māori and Pacific peoples

Structure

Evidence of local arrangements to ensure that Māori and Pacific peoples have access to culturally appropriate diabetes.

Process

The proportion of Māori and Pacific people with diabetes who accessed culturally appropriate diabetes services.

Numerator	The number of Māori and Pacific people with diabetes who have accessed diabetes services and report satisfaction within the past year
Denominator	The number of Māori and Pacific people with diabetes

Outcome

Māori and Pacific people report satisfaction with access to diabetes services and that they are culturally appropriate.

Older adults and residential care

Structure

Evidence of local arrangements to ensure that all older adults have collaborative yearly review of diabetes management goals where appropriate.

Process

The proportion of people with diabetes over the age of 65 years.

Numerator	The number of people in the denominator who have had a review of diabetes management goals within the past year
Denominator	The number of people with diabetes over the age of 65 years

Outcome

Partnership between health care professionals and individuals with diabetes in planning of yearly diabetes management goals where appropriate.

Mental health or cognitive problems

Structure

Evidence of local arrangements to ensure that people with mental health conditions are assessed for diabetes and managed appropriately.

Process

- (a) The proportion of people with mental health conditions on antipsychotic medication assessed for diabetes within the past year.

Numerator	The number of people in the denominator receiving an assessment for diabetes within the past year
Denominator	The number of people with diagnosis of mental health condition on antipsychotic medication

- (b) The proportion of people with mental health conditions and diabetes who have had a diabetes review within the past year.

Numerator	The number of people in the denominator who have had a diabetes review within the past year
Denominator	The number of people with mental health conditions and diabetes

Structure

Evidence of local arrangements to ensure that people with cognitive problems are assessed for diabetes, which is then managed appropriately.

Process

- (a) The proportion of people with cognitive problems who are assessed for diabetes.

Numerator	The number of people in the denominator receiving an assessment for diabetes
Denominator	The number of people with cognitive problems

- (b) The proportion of people with cognitive problems and diabetes whose diabetes is managed appropriately.

Numerator	The number of people in the denominator whose diabetes is managed appropriately
Denominator	The number of people with cognitive problems and diabetes

Outcome

Appropriate management and ongoing monitoring of individuals with mental health or cognitive problems with diabetes.

Advanced care planning

Structure

Evidence of local arrangements to ensure that people approaching end of life are offered a discussion about their plans.

Process

The proportion of people with diabetes approaching end of life who have an appropriate diabetes management plan.

Numerator	The number of people in the denominator approaching end of life who have an appropriate diabetes management plan
Denominator	The number of people with a diagnosis of diabetes

Outcome

Partnership between health care professionals and individuals with diabetes in end-of-life care planning.

Individuals in prison

Structure

Evidence of local arrangements to ensure that all individuals on commencement of sentence are assessed for risk of diabetes and screened appropriately (unless already diagnosed).

Process

The proportion of people commencing prison sentence with identified risk factors for diabetes.

Numerator	The number of people in the denominator with risk factors for diabetes commencing prison sentence
Denominator	The number of people in prison

Outcome

Establish a baseline of diabetes condition in individuals commencing prison sentences.

Structure

Evidence of local arrangements to ensure that all prisoners receive ongoing monitoring in accordance with national guidelines and locally agreed clinical pathways.

Process

The proportion of people in prison with diabetes.

Numerator	The number of people in the denominator with diabetes receiving ongoing monitoring of diabetes
Denominator	The number of people in prison

Outcome

Reduction of incidence of long term diabetes complications.

Immigrants and refugees

Structure

Evidence of local arrangements to ensure that all immigrants and refugees have access to diabetes services and with appropriate translation services as required.

Process

The proportion of immigrants/refugees with diabetes accessing primary care services within the past year.

Numerator	The number of people in the denominator accessing services for diabetes care within the past year
Denominator	The number of immigrants with diabetes



Resources

Māori and Pacific peoples

Some helpful recommendations for **working with Māori with diabetes** can be found in the booklet prepared for the Medical Council of New Zealand by Mauri Ora Associates – *Best health outcomes for Māori: Practice implications*. It can be accessed at:

<https://www.mcnz.org.nz/assets/News-and-Publications/Statements/Best-health-outcomes-for-Maori.pdf>.

Māori models of health to promote the health of Māori:

www.hauora.co.nz/resources/Hauora%20KeepinguptoDate3-09.pdf.

Some helpful recommendations for **working with Pacific peoples with diabetes** can be found in the booklet prepared for the Medical Council of New Zealand by Mauri Ora Associates – *Best health outcomes for Pacific peoples: Practice implications*. It can be accessed at:

www.mcnz.org.nz/assets/News-and-Publications/Statements/Best-health-outcomes-for-Pacific-Peoples.pdf.

The report '**Primary care for Pacific people: A Pacific and health systems approach**' (Southwick et al 2012) presents evidence to support improvements in primary care delivery to Pacific peoples. The full document is available here: www.pacificperspectives.co.nz/primary-health-research.html or here: www.health.govt.nz/publication/primary-care-pacific-people-pacific-and-health-systems-approach.

The Ministry of Health Pacific Health and Disability Workforce Development Plan is a key resource for supporting Pacific workforce participation at all levels of the health system. It can be accessed at:

<https://www.health.govt.nz/system/files/documents/publications/pacifichealthanddisabilityworkforcedevelopmentplan.pdf>.

Older adults and residential care

Health of older people strategy (Ministry of Health 2002) available:
www.health.govt.nz/publication/health-older-people-strategy.

Diabetes care for aged residential care facilities in Hawkes Bay (2012)

www.healthhb.co.nz/wp-content/uploads/2012/11/Diabetes-Care-for-Aged-Residential-Care-Facilities-in-Hawkes-Bay-2012-Reference-Book.pdf.

Diabetes care guidelines for older adults:

www.bd.com/us/diabetes/page.aspx?cat=7001&id=10006.

Seniors living with diabetes (American)

www.diabetes.org/living-with-diabetes/treatment-and-care/seniors/.

Diabetes control in older people – treat the patient not the HbA_{1c}:

www.bmj.com/content/bmj/346/bmj.f2625.full.pdf.

Living healthy with diabetes – a guide for adults 55 and up (slightly American perspective):

<http://main.diabetes.org/dorg/PDFs/living-with-diabetes/living-healthy-with-diabetes-guide.pdf>.

Treatment of type 2 diabetes mellitus in the older patient

www.uptodate.com/contents/treatment-of-type-2-diabetes-mellitus-in-the-older-patient#H1.

Diabetes guidelines for **elderly residents in long-term care (LTC) facilities** pocket reference (Canadian Nova Scotia):

<http://diabetescare.nshealth.ca/sites/default/files/files/LTCPocketReference.pdf>.

Treating hyperlipidemia in severe and very severe frailty, treating hypertension in frailty, diabetes guidelines for the frail elderly, diabetes guidelines for elderly residents in long term care: <http://pathclinic.ca/resources/> (Canadian path (palliative and therapeutic harmonisation) clinic).

Medical aspects of fitness to drive

www.nzta.govt.nz/resources/medical-aspects/docs/medical-aspects.pdf.

Food and nutrition guidelines for healthy older people

[www.moh.govt.nz/notebook/nbbooks.nsf/o/84bbe5f068e613a5cc25764d00671d2e/\\$FILE/food-nutrition-guidelines-older-people-consultation-sep09.pdf](http://www.moh.govt.nz/notebook/nbbooks.nsf/o/84bbe5f068e613a5cc25764d00671d2e/$FILE/food-nutrition-guidelines-older-people-consultation-sep09.pdf).

Mental health or cognitive problems

Mental health – Refer to Te Pae Kaiawha, the Ministry of Health-commissioned mental health website designed for DHBs PHOs and primary mental health practitioners to access information about the primary health services delivery models and tools being used in different parts of New Zealand. Te Pae Kaiawha: www.primarymentalhealth.org.nz/.

Emotional and psychological support and care in diabetes 2010:

www.diabetes.org.uk/Documents/Reports/Emotional_and_Psychological_Support_and_Care_in_Diabetes_2010.pdf.

The use of antipsychotics in residential aged care – clinical recommendations developed by the RANZCP Faculty of Psychiatry of Old Age (New Zealand):
www.bpac.org.nz/a4d/resources/docs/RANZCP_Clinical_recommendations.pdf

Te Pou o Te Whakaaro Nui (the National Centre of Mental Health Research, Information and Workforce Development) has published two documents pertaining to disability in New Zealand. The first is a review of literature and the second is a report commissioned by Health Workforce New Zealand and the Ministry of Health Disability Support Service group to progress the ‘Disability Support Services Workforce Action Plan’. Both documents can be accessed from here: www.tepou.co.nz/library/tepou/improving-access-to-primary-care-for-disabled-people.

Advanced care planning

The Conversation Project focuses on advanced care planning:
<http://theconversationproject.org/>.

The starter kit has great tips for starting the discussion around end-of-life care:
<http://theconversationproject.org/starter-kit/intro/>.

A New Zealand film on advanced care planning, ‘Living for today planning for tomorrow’:
www.advancecareplanning.org.nz/healthcare/.

Advanced care planning:
www.advancecareplanning.org.nz/.

‘**A good death**’ is a film about end-of-life care and advanced care planning:
<http://agooddeath.co.nz/>.

Best Practice Advocacy Centre (BPAC) NZ (2006) **Providing palliative care to Māori** available at: www.bpac.org.nz/resources/campaign/palliative/palliative_Maori.asp.

BPAC NZ (2011) **Treatment for the dying patient:** The Liverpool Care Pathway available at: www.bpac.org.nz/BPJ/2011/june/lcp.aspx.

BPAC NZ (2011) **End-of-life care for patients with chronic disease:** The need for a paradigm shift available from: www.bpac.org.nz/BPJ/2011/november/end-of-life.aspx.

Hospice NZ Standards for Palliative Care (2012). The purpose of this document is to ensure the best possible care for all people in New Zealand as they approach the end of their life and die. Available here: www.southerncancernetwork.org.nz/file/fileid/45559.

Ageing and indigenous health in Aotearoa New Zealand (Australian and New Zealand Society for Geriatric Medicine 2013):
www.anzsgm.org/documents/PositionStatementNo24AgeingMaoriHealthinAotearoa.pdf.

Individuals in prison

A **HealthEd leaflet** made available in hard copy to all men's prisons in New Zealand in 2013 is available online here: <https://www.healthed.govt.nz/system/files/resource-files/DC1306.pdf>.

'This diabetes leaflet encourages readers to find out more about diabetes and whether they are at risk of having diabetes. It provides information for prisoners, their families and Corrections staff about diabetes, including who is most at risk, possible symptoms, and the treatment of diabetes.' <https://www.healthed.govt.nz/resource/do-i-need-find-out-about-diabetes-o>.

The American Diabetes Association has put out a position statement about diabetes management in correctional institutions (American Diabetes Association 2014a).

Immigrants and refugees

Refugee health care is a handbook for health professionals:

www.health.govt.nz/system/files/documents/publications/refugee-health-care-a-handbook-for-health-professionalsv2.pdf.

Information for visitors and immigrants to New Zealand – what are the diabetes services like in New Zealand?:

www.diabetes.org.nz/about_diabetes/information_for_visitors_and_immigrants_to_new_zealand.

Diabetes prevention education programme (Australian) for immigrant and refugee women:

www.mcwh.com.au/downloads/2010/Oct10/Diabetes_Healthy_Living_Project_Final_Report.pdf.

Evidence based clinical guidelines for immigrants and refugees (a Canadian document): www.ncbi.nlm.nih.gov/pmc/articles/PMC3168666/pdf/183e824.pdf.



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Standard 19

Those with uncommon causes of diabetes (eg, cystic fibrosis, monogenic, post-pancreatectomy) should have access to specialist expertise with experience in these conditions.

Key practice points

- Diabetes due to uncommon cause is an infrequently encountered, complex condition.
- Correct diagnosis allows for specific and appropriate treatment.
- Most health professionals encounter type 2 diabetes frequently, and have limited experience in managing diabetes with uncommon causes.
- Current guidelines available in New Zealand are based on type 2 diabetes and do not meet the specific needs of people with diabetes from uncommon causes.
- Specialist expertise is required due to the specificity of the condition and unique treatment requirements.

Read this standard in conjunction with the equality and diversity section in the introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure people with uncommon causes of diabetes have access to specialists with expertise and experience in these conditions.

Health care professionals ensure they have the competence and expertise to provide specialist support for people with uncommon causes of diabetes or make appropriate referrals.

Planners and funders ensure services are commissioned that provide specialist expertise and experience for people with uncommon causes of diabetes.

People with uncommon causes of diabetes receive relevant and experienced specialist diabetes care.

Definitions

Uncommon causes of diabetes are described by the American Diabetes Association (2010) in summary as follows:

- **Monogenetic defects in beta cell function** are characterised by onset at an early age and impaired insulin secretion with minimal or no defects in insulin action. They include different subtypes of gene disorders including neonatal diabetes mellitus, monogenic diabetes of infancy, maturity-onset diabetes of the young (MODY) and other rarer diabetes-associated syndromic diseases.
- **Disease of the exocrine pancreas:** Any process that injures the pancreas may cause diabetes including pancreatitis, pancreatectomy, pancreatic carcinoma, trauma and infection. Cystic fibrosis and haemochromatosis damage beta cells and impair insulin secretion.

- **Endocrinopathies:** Several hormones antagonise insulin action; therefore an excess of these hormones may induce diabetes. Somatostatinoma and aldosteronoma-induced hypokalaemia can cause diabetes in part by inhibiting insulin secretion, but may resolve after removal of the tumour.
- **Drug or chemical induced diabetes:** Many drugs, including thiazides, glucocorticoids, dilantin and more, may impair insulin secretion or action and may precipitate diabetes in those with existing insulin resistance. Certain toxins may permanently destroy beta cells.
- **Infections:** Certain viruses are associated with beta cell destruction, for example congenital rubella, coxsackievirus B, cytomegalovirus, adenovirus and mumps.
- **Uncommon forms of immune-mediated diabetes** may occur in people with a number of autoimmune related conditions, for example stiff-man syndrome where patients usually have high concentrations of GAD autoantibodies of which one-third of the patients will develop diabetes, or anti-insulin receptor antibodies.
- **Other genetic syndromes sometimes associated with diabetes** include Down syndrome, Klinefelter syndrome and Turner syndrome. Wolfram's syndrome is characterised by insulin deficiency and the absence of beta cells at autopsy.

A full list of etiologic classification of diabetes mellitus by the American Diabetes Association (ADA 2010) can be found here:

http://care.diabetesjournals.org/content/33/Supplement_1/S62.full.pdf+html.

Forms of **drug induced diabetes** are described by Comi (2004) as follows:

- **Corticosteroids** may cause hyperglycaemia, which may return to normal after the steroid treatment is stopped. However, particularly if corticosteroids are taken over longer periods of time, steroid treatment can sometimes lead to the development of type 2 diabetes permanently. Whilst on steroid medication, insulin may be required; however, once steroids are discontinued, anti-diabetic medication may be reduced or stopped.
- **Beta-blockers** inhibit insulin secretion by the pancreatic islets in response to glucagon, glucose or arginine.
- **Thiazide diuretics** may increase blood glucose levels. These may, but not always, return to normal if treatment with thiazide diuretics is stopped. They act to reduce insulin secretion and increase insulin sensitivity.
- **Antipsychotics** may cause weight gain and hyperglycaemia. Blood glucose levels may return to normal if medication is stopped. However, if significant weight has been gained over the course of the treatment, insulin resistance and type 2 diabetes may be permanent. The weight gain leading to increased insulin resistance is the most likely mechanism for inducing diabetes; however, inhibition of insulin secretion is likely to be occurring in some people.
- **Statins** in high doses have demonstrated a link to a higher risk of type 2 diabetes, likely due to a decrease in pancreatic beta cell function and decreasing peripheral insulin sensitivity.



Introduction

Those with uncommon causes of diabetes need access to specialist expertise with experience in these conditions due to the specificity of the condition and differing treatment requirements. While there are many uncommon causes of diabetes, examples used for the purpose of this Quality Standard are **monogenic, cystic fibrosis, thalassaemia** and **pancreatectomy**.

Knowing and understanding monogenic diabetes including the differing forms of MODY means that the affected person can be treated in the most appropriate way possible. Advice can also be provided about how the disease will progress and what complications can be expected, and family/whānau members advised about the risks of inheriting the disease (New Zealand Society for the Study of Diabetes [NZSSD] 2012). The study advises consultant diabetes or endocrinology review for all molecular genetic testing of suspected cases due to the expense and the possible need for cascade testing of relatives.

Diabetes mellitus is a well-recognised complication of cystic fibrosis and, as survival in cystic fibrosis improves, so too does the prevalence of cystic fibrosis-related diabetes (The UK Cystic Fibrosis Trust Diabetes Working Group 2004). It is now a common and expected complication of cystic fibrosis as 10–30% of 15- to 25-year-olds with cystic fibrosis will develop diabetes (International Society for Pediatric and Adolescent Diabetes 2000). As people with cystic fibrosis-related diabetes (CFRD) survive longer, they are also at risk of developing diabetes-related complications, and their diabetes management becomes much more complex as the nature of the cystic fibrosis changes (The UK Cystic Fibrosis Trust Diabetes Working Group 2004). Management of diabetes in people with cystic fibrosis presents a different set of challenges to people with type 1 or type 2 diabetes and people with CFRD should be referred to a consultant with a specialty in managing patients with CFRD (The UK Cystic Fibrosis Trust Diabetes Working Group 2004).

Thalassaemia can lead to iron overload affecting beta-cell function and the decreasing insulin sensitivity of puberty contributes to the risk of diabetes. If iron levels remain high, treatment with high doses of insulin may be required (International Society for Pediatric and Adolescent Diabetes 2000). It is suggested that a long period of insulin resistance and hyperinsulinaemia might lead also to secondary beta cell failure (Li et al 2014). Impaired glucose tolerance in these people is common (up to 27%), and patients and health professionals should be aware of the high incidence. It is likely that the fatty replacement of the pancreas cells is irreversible, representing end stage pancreatic disease (Li et al 2014).

Pancreatitis, cancer and trauma can all harm the pancreatic beta cells or impair insulin production, thus causing diabetes. If the damaged pancreas is removed, diabetes will occur due to the loss of the beta cells. People who have had a pancreatectomy will not be able to produce any of their own insulin and will therefore need to take regular insulin injections in a similar way to people with type 1 diabetes. In the past, total pancreatectomy has been avoided due to the risks associated with post-operative brittle insulin dependent diabetes associated with hypoglycaemia, and malabsorption problems. However, with the advent of high quality enzyme formulations and advances in diabetes specialist care there has been a resurgence of interest in total pancreatectomy as a treatment as pancreatic insufficiency can now be managed safely (Crippa et al 2011).



Guidelines

Monogenic diabetes

In the European report on treatment and care of diabetes in children by the SWEET group, it is suggested that while in the past many patients with monogenic forms of diabetes have been diagnosed incorrectly as either type 1 diabetes (T1DM) or type 2 diabetes (T2DM) dependent on the age of hyperglycaemia detection, current diagnostic availability should allow specific diagnosis (SWEET 2010).

Genetic testing should be available in all centres either locally or nationally, allowing for specific treatment depending on the genetic defect. Treatment may be as simple as annual follow-up without diet or medication, to intensive diet and/or sulphonylurea or insulin (SWEET 2010). There may be progressive beta-cell deficiency in some children with transcription factor mutations therefore creating the need for oral hypoglycaemic agents. HNF-1 α variants may exhibit sensitivity to small doses of sulphonylureas (with the risk of hypoglycaemia) and may require insulin treatment managed by a specialist team but this is usually in adulthood (International Society for Pediatric and Adolescent Diabetes 2000).

Genetic testing for monogenic diabetes is recommended under the care of an expert diabetologist or endocrinologist (New Zealand Society for the Study of Diabetes 2012).

The NZSSD Monogenic Guidelines can be found here:

www.nzssd.org.nz/education/2013%20Monogenic_diabetes_card_with_forms_18%20Dec%20copy.pdf

Cystic fibrosis

The Standards of Care for Cystic Fibrosis (CF) in New Zealand by the Cystic Fibrosis Association of New Zealand (2011) suggest the following:

- The primary place of CF care should be at a hospital with a CF clinic closest to where the person with cystic fibrosis lives.
- People with cystic fibrosis should be seen at least four times a year in a dedicated CF clinic.
- If attending a smaller local clinic, the makeup of the health professional team may vary; therefore, there needs to be a well-defined relationship with a Regional CF Centre.
- A regional multidisciplinary team should review all people with cystic fibrosis at least annually or more frequently as dictated by individual needs:
 - patients may travel to regional cystic fibrosis centres, or
 - combined clinics may be held locally.
- Core members of the regional centre multidisciplinary team are involved.
- Core members of the regional centre multidisciplinary team at a minimum should include:
 - CF clinician
 - nurse specialist
 - specialist physiotherapist
 - dietitian.

- Between visits regional CF centre support can be augmented through the use of the TelePaediatrics service video link system.
- The extent of regional clinic contact is determined by an individual's need rather than geography.
- All people with cystic fibrosis have an annual review – usually regional CF centre involvement occurs then.
- It is impractical to expect all specialist services can be provided outside regional CF centres:
 - access to specialist services must be available to all patients depending on need and regardless of location
 - the requirement of a regional CF centre is extensive and includes onsite availability from sub-specialists experienced in CF complications including endocrinology
 - people with cystic fibrosis-related diabetes should have access to, and an established working relationship with, an endocrinologist and diabetes service with knowledge and expertise in the management of CFRD.

The UK Cystic Fibrosis Trust recommends the following for people with cystic fibrosis-related diabetes:

‘Ideally the CF Clinician and Diabetologist should carry out a combined general and CFRD Annual Review. In practice, it is usually more convenient for the CFRD Annual Review to be carried out at a different appointment to the general CF Annual Review. The aim of the CFRD Annual Review is to screen for, and if necessary; treat early complications, check that diabetic treatment is adequate and appropriate, to assess nutritional management and to address adherence issues, diabetic education and psychosocial issues’ (The UK Cystic Fibrosis Trust Diabetes Working Group 2004, p 32).

Insulin treatment will improve hyperglycaemia and help to prevent catabolic weight loss in CF particularly during intercurrent infections. High dietary energy intake is recommended including high fat and high complex carbohydrates (International Society for Pediatric and Adolescent Diabetes 2000). The American Diabetes Association recommends as part of their Clinical Care Guideline for Cystic Fibrosis-related Diabetes Management that ‘patients with CFRD should be managed by a multidisciplinary team of health professionals with expertise in CF and diabetes. The diabetes team should be intimately familiar with CFRD, recognising differences between this and type 1 and type 2 diabetes pathophysiology and treatment. Good communication between diabetes and CF care providers is essential. Poor team communication and inadequate or conflicting information from health care providers have been identified as significant sources of stress for patients with CFRD’ (Moran et al 2010, pp 2702–3).

Thalassaemia

The Northern California Comprehensive Thalassemia Center Standard of Care Guidelines can be found here: <http://thalassemia.com/soc/treatment-guidelines-9.aspx>

These guidelines recommend a fasting glucose semi-annually, and if it is greater than 6.1 mmol/L, an oral glucose tolerance test is indicated. In addition a two-hour oral glucose tolerance test should be performed at 10, 12, 14, and 16 years of age and annually thereafter. Further recommendations include that the patient should be referred to endocrinology for management of diabetes mellitus or glucose intolerance and patients diagnosed with glucose intolerance should have their chelation therapy reviewed and intensified (Northern California Comprehensive Thalassemia Center 2012).

The Academy of Medicine of Malaysia has clinical practice guidelines that suggest the early and adequate use of iron chelation can prevent DM, and both DM and impaired glucose tolerance may improve in a third of patients after intensive combined chelation treatment. Use of insulin in a thalassaemia patient with DM is normally required but metabolic control may be difficult to achieve due to variable pancreatic beta cell function. The use of oral anti-diabetic agents is undetermined (Academy of Medicine Malaysia 2009).



Implementation advice

Correct diagnosis of a possible uncommon cause of diabetes allows for individualised and appropriate treatment resulting in reduced complications and more effective response to treatment (Juszczak et al 2014).

Joint clinics are one of the most effective settings for clinicians to look after people with dual conditions where members of both the specialist diabetes team and condition specialist work together to look after the individual. This enables the health professionals to manage the complex needs of both conditions and allows all to learn from each other and provide a consistent approach (Tzoulis et al 2014).

People with diabetes receiving corticosteroid treatment or those who develop diabetes as a result of corticosteroids can be particularly difficult to manage due to the fluctuations in therapy requirements and circadian glycaemic pattern (Burt et al 2011). Prescribers of corticosteroids should work in partnership with diabetes expert teams at the commencement of treatment to enable early, appropriate and frequent anti-diabetes medication changes as needed for the individual (Stevens et al 2011). This includes all those prescribing corticosteroids across the disciplines including, but not limited to, neurological, respiratory, haematology, oncology and palliative care.

In remote locations, care is likely to be provided by a locally based physician and these practitioners should have ready access to the facilities and advice provided by specialist diabetes teams. For complex individuals, annual reviews should take place with the specialist team (International Society for Pediatric and Adolescent Diabetes 2000). This model of shared care should strengthen rather than weaken the relationship between the person with diabetes and their local provider (Cystic Fibrosis Association of New Zealand 2011).

Specialist teams from district or regional centres might organise outreach clinics where people with diabetes have difficulty travelling. The specific role of this diabetes team is to provide specialised hospital medical care, expert comprehensive ambulatory care of diabetes and associated conditions, expert advice on issues related to diabetes (exercise, travel and sickness), and screening for complications (International Society for Pediatric and Adolescent Diabetes 2000).

Telemedicine consultations with diabetes specialist services should be considered as they can remove barriers associated with location to accessing these services (Levin et al 2013). Ideally, there should also be specialist telephone support available 24 hours a day (International Society for Pediatric and Adolescent Diabetes 2000).



Implementation examples / innovations



A joint thalassaemia and diabetes clinic

A joint thalassaemia and diabetes clinic was established at the Department of Diabetes, Whittington Health, London in 2005. Patients were reviewed by a multidisciplinary team including a consultant diabetologist and haematologist. A four-year study showed improvement in glycaemic control with fructosamine reduction and improved lipids. When patients attending the clinic were compared to a national diabetes audit, the number achieving goals for glycaemic, blood pressure and cholesterol control were significantly higher. A fifth of the patients had macrovascular complications while a significant number had endocrinopathies and the combined clinic was able to effectively manage these complex patients (Tzoulis et al 2014).



Pennsylvania telemedicine consultation service

To address the problem rural communities face in accessing specialist diabetes care, a telemedicine consultation service was trialled in rural Pennsylvania. Twenty-five patients with diabetes participated via a 45-minute videoconferencing consultation with an endocrinologist at an urban centre and a locally based diabetes nurse. Patients and providers uniformly reported high levels of satisfaction and acceptability. Mean HbA1c decreased from 9.6% (~80 mmol/mol) to 8.5% (69 mmol/mol) ($p < 0.001$) (Toledo et al 2012).



Assessment tools

Process

The proportion of people with uncommon causes of diabetes who have access to specialists with expertise and experience in these conditions.

Numerator	The number of people in the denominator accessing specialists with expertise and experience in their condition
Denominator	The number of people with uncommon causes of diabetes



Resources

New Zealand Society for the Study of Diabetes (NZSSD) website, health professionals' section provides a monogenic screening card: www.nzssd.org.nz/professionals.html

Consumer tools

Global Genes provides consumers with advice in regards to genetic testing:
<https://globalgenes.org/toolkits/genetic-testing-is-this-my-path-to-a-diagnosis-3/introduction/>

The same website in the future will also have toolkits available that some may find helpful for 'Transitioning to adulthood as a rare disease patient' and 'Caring for yourself as a caregiver' found at: <https://globalgenes.org/toolkits/>

Cystic Fibrosis Foundation. 2011. *Managing Cystic Fibrosis Related Diabetes CFRD: Instruction guide for patients and families* (5th edition). USA: Cystic Fibrosis Foundation.

The National Diabetes Information Clearinghouse provides information for the consumer on monogenic forms of diabetes:
<http://diabetes.niddk.nih.gov/dm/pubs/mody/index.aspx>.



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Standard 20

Pregnant women with established diabetes and those developing gestational diabetes (GDM) should have access to prompt expert advice and management, with follow-up after pregnancy. Those with diabetes of child-bearing age should be advised of optimal planning of pregnancy including the benefits of pre-conception glycaemic control. Those not wishing for a pregnancy should be offered appropriate contraceptive advice as required.

Key practice points

- The prevalence of gestational, type 1 and type 2 diabetes is increasing, particularly among women of Māori, Pacific, Asian and South Asian ethnicity. Women with pre-existing diabetes should be aware of risks associated with poor glycaemic control and pregnancy.
- Women with pre-existing diabetes should receive pre-conception planning and care to minimise these risks.
- Gestational diabetes carries increased risk of morbidity and mortality for the mother and baby and should therefore be screened and managed according to national guidelines.

Read this standard in conjunction with the equality and diversity section in the Introduction to the Toolkit.

What the quality statement means for each audience

Service providers ensure local arrangements that provide information to women of childbearing age with diabetes on pre-conception glycaemic control and any risks including medication that may harm an unborn child, and ensure women with diabetes planning a pregnancy are offered pre-conception care, and those not planning a pregnancy are offered advice on contraception.

Health care professionals ensure women with diabetes of childbearing age are provided with information on pre-conception glycaemic control and on any risks including medication that may harm an unborn child, and are offered pre-conception care if they are planning a pregnancy or offered advice on contraception if they are not planning a pregnancy.

Planners and funders ensure services are in place to provide pre-conception advice for women with diabetes of childbearing age, and offer pre-conception care for women with diabetes planning a pregnancy. Advice on contraception should be provided to those not planning a pregnancy.

Women of childbearing age who have diabetes are regularly given advice about the benefits of controlling their blood glucose before a pregnancy, and any risks such as medication that might harm an unborn baby. Women with diabetes who are planning a pregnancy are offered care leading up to the pregnancy. Women not planning a pregnancy are offered advice on contraception.

Definitions

'Established diabetes' refers to women diagnosed with diabetes prior to pregnancy planning or a confirmed pregnancy.

'Women of childbearing age with diabetes' refers to all women with diabetes (excluding gestational diabetes) who have childbearing potential.



Introduction

According to the Diabetes and Pregnancy Guideline documentation (2014) 'approximately 61,000 women give birth in New Zealand each year and 4.9–6.6% of pregnancies in New Zealand involve women with diabetes' (p 2). Type 1 diabetes affects approximately 0.1–0.2% of all pregnancies (Chiang et al 2014) and the prevalence of gestational, type 1 and type 2 diabetes is increasing, particularly affecting women of Māori, Pacific and South Asian ethnicity (NZ Gestational Diabetes Working Group [NZGDMWG] 2014).

Established type 1 or 2 diabetes

Women with pre-existing type 1 and type 2 diabetes (including those in whom the diabetes was not recognised before pregnancy) have an increased risk of adverse pregnancy outcomes, including miscarriage, foetal congenital anomaly and perinatal death (National Collaborating Centre for Women's and Children's Health 2008). To minimise risks associated with pregnancy and established type 1 or 2 diabetes, pre-conception planning and care is critical. Evidence suggests pre-conception care with tight glycaemic control (HbA_{1c} levels should be as close to normal as possible) improves outcomes including decreased perinatal mortality and decreased congenital malformations (Chiang et al 2014). The prevalence of type 2 diabetes is increasing in women of reproductive age and outcomes may be equivalent or worse than in those with type 1 diabetes (Scottish Intercollegiate Guidelines Network [SIGN] 2010). Medications used by such women should be evaluated prior to conception, since some drugs commonly used to treat diabetes and its complications may be contraindicated or not recommended in pregnancy, including statins, ACE inhibitors, angiotensin receptor blockers (ARBs), and some noninsulin therapies.

Pregnancy can affect glycaemic control in women with pre-existing diabetes, increasing frequency of hypoglycaemia and hypoglycaemia awareness, and the risk of ketoacidosis. General anaesthesia in women with diabetes can also increase the risk of hypoglycaemia. The progression of certain complications of diabetes, specifically diabetic retinopathy and diabetic nephropathy, can be accelerated by pregnancy (National Institute for Health and Care Excellence [NICE] 2008). Infants whose mothers with diabetes received dedicated multidisciplinary pre-pregnancy care showed significantly fewer major congenital malformations (approximating to the rate in non-diabetic women) compared to infants whose mothers did not receive such care (SIGN 2010).

Contraception should be discussed on an individual basis with all women of childbearing age with diabetes. There is little evidence of choice of contraceptive method specifically in these women. In general, the contraceptive advice for a woman with diabetes should follow that in the general population (SIGN 2010).

Gestational diabetes

Gestational diabetes mellitus (GDM) is defined by the **American Diabetes Association** (2013) as ‘any degree of intolerance with onset or first recognition during pregnancy’ (pp S70–71). In New Zealand, gestational diabetes affects 3000–4000 women per annum; that is, between 4.9–6.6% of pregnancies. However, prevalence rates are sensitive to the definition and diagnostic criteria of GDM that is currently under debate. If undiagnosed or untreated, there may be significant negative consequences, both for short and long term, for the woman and/or her baby.

For the baby, the potential for macrosomia and neonatal hypoglycaemia is high, and there are possible intergenerational effects of exposure of the foetus to maternal diabetes. For the woman, GDM is associated with a high risk for type 2 diabetes with up to 50% of women developing type 2 diabetes within 10 years. Therefore, active screening, diagnosis and management of GDM during pregnancy are essential. Postnatal interventions that may reduce progression to type 2 diabetes in high-risk populations (in particular limiting weight gain) are important. Modification of risk factors and regular screening is an important aspect of postnatal education and ongoing care (see health literacy Standard 1).



Guidelines

The **New Zealand Diabetes in Pregnancy Guidelines** with a focus on gestational diabetes reflect best practice recommendations for the screening and management of GDM in New Zealand. They are due to be published in 2014 with specific implementation advice.

In the meantime, the following guidelines apply.

Screening, diagnosis and services for women with gestational diabetes mellitus (GDM) in New Zealand: A technical report from the National GDM Technical Working Party published in the *Journal of the New Zealand Medical Association* (2008).

Australian Diabetes in Pregnancy Society (ADIPS) 2005
Guideline on the management of pregnancy in type 1 and 2 diabetes
http://adips.org/downloads/adips_pregdm_guidelines.pdf

Synopsis: In New Zealand, the approach to identifying women with GDM or undiagnosed type 2 diabetes has varied. The National GDM Technical Working Party reviewed the available data in the New Zealand context and recommend that (1) All pregnant women are offered screening for GDM backed up with relevant educational, systems and materials for health professionals and the women; (2) Criteria for GDM should remain unchanged pending further information (which should be actively sought); (3) Women at high risk of undiagnosed type 2 diabetes in pregnancy should be screened at booking: the HbA1c was recommended as a practical initial screening test; and (4) A structured, audited, population-based approach to managing women with GDM should be introduced in each district.

The **National GDM Technical Working Party Technical Report** can be found here:
<http://journal.nzma.org.nz/journal/121-1270/2950/>.

The Scottish Intercollegiate Guidelines Network's guideline 116 Management of diabetes: A national clinical guideline provides comprehensive guidance for diabetes in pregnancy care: www.sign.ac.uk/pdf/sign116.pdf.

National Institute for Health and Care Excellence Guideline: Diabetes in pregnancy: management of diabetes and its complications from pre-conception to the postnatal period: www.nice.org.uk/guidance/CG63/chapter/introduction.

American Diabetes Association Type 1 diabetes through the life span: A position statement of the American Diabetes Association:
<http://care.diabetesjournals.org/content/early/2014/06/09/dc14-1140.full.pdf+html>.



Implementation advice

Established diabetes

Barriers to pre-conception care have been identified by NICE (2008) as lack of pregnancy planning, sociocultural factors, misconceptions and lack of knowledge, attitudes of health care providers towards pregnancy, lack of social support, appropriateness and availability of services, and younger age. Services should therefore be arranged that acknowledge and aim to reduce these barriers.

The workforce needs to be appropriately resourced and skilled to provide care to women with established diabetes and for those developing gestational diabetes. This will include coordination and appropriate transfer of care between primary care teams, specialist diabetes services (physician, diabetes nurse specialist and diabetes specialist dietitian), obstetricians, and midwives according to local guidelines.

International guidelines recommend pre-conception and perinatal care is provided by an experienced multidisciplinary team, composed of diabetes nurse educators (in New Zealand diabetes nurse specialists), midwives, (diabetes specialist) dietitians, obstetricians and diabetologists. Care provided in this way has been shown to minimise maternal and foetal risks in women with diabetes (ADIPS 2005; SIGN 2010; Canadian Diabetes Association 2013) (see Standard 16).

Gestational diabetes

- A suitable programme to detect and treat GDM should be offered to all women in pregnancy (ADIPS 2005; New Zealand Guidelines Group 2014; SIGN 2010).
- Pregnant women with GDM should be offered dietary advice and blood glucose monitoring and be treated with glucose-lowering therapy depending on target values for fasting and postprandial targets (SIGN 2010).
- Specialist dietetic and laboratory services need to be in place to manage the diagnoses of probable undiagnosed and gestational diabetes (NZGDMWG guidelines 2014)
- Continuing education of GPs and midwives about screening for diabetes in pregnancy should be provided (NZGDMWG 2014).



Implementation examples / innovations

Gestational diabetes



Diabetes Projects Trust

The Diabetes Projects Trust (DPT) was originally called the 'South Auckland Diabetes Project', and in 2013 they celebrated 21 years of delivering services focused on preventing diabetes and its complications. The Diabetes Projects Trust emphasises partnership with the community to achieve better health for present and for future generations. The DPT has a focus on prevention, health promotion, empowerment, quality improvement support, and research and delivers a number of programmes that achieve these aims.

The DPT Gestational Diabetes Mellitus project focuses on reducing the impact of GDM on mother and child. At the moment, there are a number of projects under way, for example looking at ways of encouraging early screening for the development of type 2 diabetes, promoting early antenatal care of mothers in subsequent pregnancies, and supporting mothers and families to adopt health behaviours that reduce the risk of future type 2 diabetes and poor health outcomes. Work is under way on a GDM diabetes registry.

The GDM Registry is a collaborative effort with funding from Counties Manukau District Health Board (CMDHB) and Diabetes Projects Trust. The Registry collects together a key subset of information about women who have had GDM in their pregnancy. This information is held in a confidential database that will be used primarily to help improve follow-up and future care. The Registry is to be linked to other data sources and will continuously receive updates, such as HbA1c results, to enable timely prompts and send out annual screening reminders over the longer term. Future positive pregnancy testing will result in a prompt to the primary carer regarding GDM history. The Registry will also allow contact to be made directly with the woman regarding relevant lifestyle interventions and health promotion activities. The registry will include data on demographics, contact and health care provider details, past and current medical history, relevant lab results, details of gestational diabetes episodes and details of participants' interaction with the service. This is taking place in CMDHB and has been designed to be suitable to roll out to other areas at a later date.

www.dpt.org.nz/our-programmes/gestational-diabetes.

Contact the Diabetes Projects Trust for more information at: gdm@dpt.org.nz.



Assessment tools

Established diabetes

Structure

Evidence of local arrangements to ensure that women of childbearing age with diabetes are regularly informed about the benefits of pre-conception glycaemic control and of any risks, including medication, which may harm an unborn child.

Process

The proportion of women of childbearing age with diabetes who are regularly informed about the benefits of pre-conception glycaemic control and of any risks including medication that may harm an unborn child.

Numerator	The number of women in the denominator informed about pre-conception glycaemic control and of any risks including medication that may harm an unborn child at their last diabetes consultation
Denominator	The number of women of childbearing age with diabetes

Structure

Evidence that women with diabetes who are planning a pregnancy are offered pre-conception care.

Process

The proportion of women of childbearing age with diabetes planning a pregnancy who are offered pre-conception care from an appropriately trained health care professional.

Numerator	The number of women in the denominator offered pre-conception care from an appropriately trained health care professional
Denominator	The number of women of childbearing age with diabetes planning a pregnancy

Structure

Evidence that women with diabetes who are not planning a pregnancy are offered advice on contraception.

Process

The proportion of women of childbearing age with diabetes not planning a pregnancy who are offered advice on contraception.

Numerator	The number of women in the denominator offered advice on contraception
Denominator	The number of women with diabetes not planning a pregnancy

Gestational diabetes mellitus

Structure

A suitable programme to detect and treat gestational diabetes is offered to all women in pregnancy.

Process

The proportion of pregnant women who are offered a screening test for gestational diabetes at the appropriate time/s.

Numerator	The number of pregnant women in the denominator offered screening at the appropriate time/s
Denominator	The number of pregnant women without known pre-gestational diabetes

The proportion of women with gestational diabetes diagnosed in their pregnancy offered a screening test after the birth of their child.

Numerator	The number of women with gestational diabetes in the denominator offered postnatal screening
Denominator	The number of women with gestational diabetes

Established and gestational diabetes

The proportion of babies of mothers who have had diabetes in pregnancy admitted to a Neonatal Intensive Care Unit.

Numerator	The number of babies of women with diabetes in pregnancy admitted to a Neonatal Intensive Care Unit in the denominator offered postnatal screening
Denominator	The number of babies of women with diabetes in pregnancy

The proportion of babies of mothers who have had diabetes in pregnancy who have a congenital anomaly.

Numerator	The number of babies of women with diabetes in pregnancy with a congenital anomaly
Denominator	The number the number of babies of women with diabetes in pregnancy

The proportion of babies of mothers who have had diabetes in pregnancy suffering perinatal mortality.

Numerator	The number of babies of women with diabetes in pregnancy suffering perinatal mortality
Denominator	The number of babies of women with diabetes in pregnancy



Resources

Auckland District Health Board has the following patient information on gestational diabetes:

<http://nationalwomenshealth.adhb.govt.nz/Portals/0/A%20to%20Z/G%20to%20L/G/G%20Gestational%20Diabetes.pdf>.

Diabetes New Zealand information on:

- gestational diabetes:
www.diabetes.org.nz/about_diabetes/gestational_diabetes
- type 2 diabetes and pregnancy:
www.diabetes.org.nz/living_with_diabetes/type_2_diabetes/pregnancy

National Diabetes Service Scheme Australia: Diabetes Australia has the following informative booklets:

- Gestational Diabetes: Life after Gestational diabetes
www.ndss.com.au/en/About-Diabetes/Gestational/
- Established Diabetes: Can I have a healthy baby – pregnancy planning
www.ndss.com.au/Global/GD/GD%20Resources/Can%20I%20have%20a%20healthy%20baby%20Booklet.pdf



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