An Roinn Sláinte
Department of Health

Adult Type 1 Diabetes Mellitus v2

National Clinical Guideline No. 17

May 2024

National Patient Safety Office
Oifig Náisiúnta um Shábháilteacht Othar

NATIONAL CLINICAL EFFECTIVENESS COMMITTEE

This National Clinical Guideline (NCG) for adults with type 1 diabetes (National Clinical Guideline No. 17) was originally published in June 2018. The guideline was developed by the original Guideline Development Group, supported by the HSE National Clinical Programme for Diabetes (NCPD). Part of the process of developing this guideline involved contextualising (for Ireland) the National Institute for Health and Care Excellence (NICE) NG17 **"Type 1 diabetes in adults: diagnosis and management"** guideline, published in 2015.

In 2021 and 2022, NICE issued updates to their 2015 NG17 guideline. In 2023, the NCPD decided to update the Irish guideline (NCG no. 17) to reflect these changes. Following discussion between the National Clinical Programme (NCP), the National Clinical Effectiveness Committee (NCEC) and NICE, a decision was taken to proceed with a rapid update for National Clinical Guideline No.17, contextualising (for Ireland) the 2015-2022 updates to the corresponding NICE guideline.

Scope of the 2024 Rapid Update

The scope of the 2024 Rapid Update was limited to the update of those recommendations which had been updated in 2021 and 2022 in the corresponding NICE guideline, where appropriate to the Irish healthcare setting. Those recommendations which are new or have been updated can be recognised by the addition of the text **'[updated 2024]'** or **'[new 2024]'** following each updated or new recommendation. Minor editorial changes have been made throughout, along with some annotations to the Implementation Plan. A note on the importance of transitions of care between the Paediatric and Adult Services has also been included. All other text should be read in the context of the original 2018 publication.

Using this National Clinical Guideline

This National Clinical Guideline applies to adults (aged 18 years and older) with type 1 diabetes in Ireland. It does not apply to children living with type 1 diabetes, adults living with type 2 diabetes or individuals living with monogenic (or other rarer forms of) diabetes.

This National Clinical Guideline is relevant to all healthcare professionals working in healthcare settings delivering care to people living with type 1 diabetes in Ireland.

Readers should note that sections of the guideline relating to the National Institute for Health and Care Excellence (NICE) Contextualisation are denoted by a light blue box with a blue border.

Disclaimer

NCEC National Clinical Guidelines do not replace professional judgment on particular cases, whereby the clinician or health professional decides that individual guideline recommendations are not appropriate in the circumstances presented by an individual patient, or whereby an individual patient declines a recommendation as a course of action in their care or treatment plan. In these circumstances the decision not to follow a recommendation should be appropriately recorded in the patient's healthcare record.

Users of NCEC National Clinical Guidelines must ensure they have the current version (hardcopy or softcopy) by checking the relevant section in the National Patient Safety Office section of the Department of Health website: www.gov.ie/clinicalguidelines

Whilst every care has been taken to ensure that all information contained in this publication is correct, the Department of Health cannot accept responsibility for any errors or omissions which may have occurred.

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Version History	
Version 1	June 2018
Version 2 (Rapid Update)	April 2024

Membership of the 2024 Rapid Update Guideline Development Group (GDG)

The GDG for the 2024 Rapid Update was chaired by Dr. Kevin Moore, with support from the HSE NCPD Lead, Professor Derek O'Keeffe. Members of the GDG are listed in table 1.

Table 1: Members of the 2024 Rapid Update Guideline Development Group

Name	Job title and affiliation
Dr Kevin Moore (Chair)	Consultant Endocrinologist
Prof Derek O'Keeffe	Clinical lead NCP Diabetes/Consultant Endocrinologist
Dervla Kennedy	NCP-Diabetes Programme Manager
Dr Clare O'Brien	Endocrine SpR
Dr Austin Bayley	Principal Clinical Psychologist
Dr Kate Gajewska	Clinical Manager for Advocacy and Research, Diabetes Ireland Patient Representative
Dr Tomás Griffin	Consultant Endocrinologist
Dr Cathy Breen	Clinical Specialist Dietitian/Dietitian Lead NCP Diabetes
Joanne Lowe	Clinical Nurse Specialist Diabetes Integrated Care/Interim nurse lead NCP Diabetes
Yvonne Moloney	Advanced Nurse Practitioner Diabetes/Nurse lead NCP Diabetes
Assumpta Coyle	Podiatry Manager/Podiatry Lead NCP Diabetes

The GDG for the original 2018 guideline was also chaired by Dr Kevin Moore, Consultant Endocrinologist. Membership nominations for the 2018 Guideline were sought from a variety of clinical and non-clinical backgrounds so as to be representative of people living with type 1 diabetes and all key stakeholders involved in the care of people living with type 1 diabetes. Members of this group are listed in table 1. Membership was sought from primary care and feedback was requested during consultation after a substantive draft was completed. All sections relating to diabetic retinopathy were contextualised by Mr David Keegan, clinical lead of the National Diabetic Retinal Screening Programme. Refer to appendix 1 for terms of reference for the GDG.

Table 2: Members of the 2018 Guideline Development Group

Name	Job title and affiliation
Dr Kevin Moore (Chair)	Consultant Endocrinologist
Prof Sean Dinneen	Clinical lead NCP Diabetes/Consultant Endocrinologist
Niamh Smyth	NCP-Diabetes Programme Manager
Tony McPoland	Patient Representative
Shane O'Donnell	Patient Representative
Anna Clarke	Health Promotion and Research Manager Diabetes Ireland
Dr Ronan Canavan	Consultant Endocrinologist
Dr Diarmuid Smith	Consultant Endocrinologist
Dr Mensud Hatunic	Consultant Endocrinologist
Dr Colin Davenport	Consultant Endocrinologist (Specialist Registrar Endocrinologist at start of development process)
Margaret Humphreys	Clinical Specialist Diabetes Dietitian /National HSE Structured Patient Education Co-ordinator
Cathy Breen	Senior Dietitian Diabetes
Mary Finn	Senior Dietitian Diabetes
Karen Townsend	Clinical Nurse Specialist Diabetes
Pauline O'Hanlon	Clinical Nurse Specialist Diabetes
Mary O'Scannail	Clinical Nurse Specialist Diabetes
Helen Twamley	Clinical Nurse Specialist Diabetes Integrated Care
Prof Brian McGuire	Professor of Clinical Psychology
Eilis Kearney	Clinical Pharmacist

Membership of the NICE Contextualisation Quality Assurance Team

Table 3: Members of NICE Guideline Contextualisation Quality Assurance Team for the 2024 Rapid Update:

Name	Job title and affiliation
Eric Power	Deputy Director
Phil Alderson	Clinical Advisor
Rachel Woodcraft	Technical Advisor
Jeremy Shaw	Programme and Contract Manager

Membership of the Health Research Board Collaboration in Ireland for Clinical Effectiveness Reviews (HRB-CICER) Budget Impact Analysis (BIA) Evaluation Team

Table 4: Members of the HRB-CICER BIA Evaluation Team

Name	Job title and affiliation
Paul Carty	Health Economist, HRB-CICER, HIQA
Michelle O'Neill	HRB-CICER Programme Manager, HIQA
Dr Patricia Harrington	Head of Assessment, Health Technology Assessment, HIQA
Prof Susan Smith	Clinical Director HRB-CICER, HRB Centre for Primary Care Research, RCSI

Membership of the NICE Guideline Development Groups and Guideline Contextualisation Quality Assurance Team for the 2018 Guideline are listed in tables 9, 10 and 11 in Appendix 6.

Credits

The role of the NCEC is to prioritise, quality assure and recommend clinical guidelines to the Chief Medical Officer for endorsement by the Minister for Health. It is intended through Ministerial endorsement that full implementation of the guideline will occur through the relevant service plans.

The NCEC and the Department of Health acknowledge and recognise the Chair and members of the Guideline Development Group (GDG) for development of the guideline. The NCEC and Department of Health wish to express thanks and sincere gratitude to all persons contributing to this National Clinical Guideline; especially those that give of their time on a voluntary basis.

Acknowledgments

As chair of the GDG, I wish to acknowledge the support of all members of the GDG as contributors to the development of this National Clinical Guideline. In particular I wish to thank and acknowledge the contributions of Prof Derek O'Keeffe and Dervla Kennedy.

I also want to acknowledge the NCEC and Ms Marion Cullinan for their support throughout the process of generating the clinical guideline. The GDG would like to thank NICE for facilitating us to contextualise their guideline.

Finally, I would like to express my thanks to those who took the time to share their expertise and provide feedback.

Dr Kevin Moore
Chair, Guideline Development Group, May 2024.

This evidence-based guideline for the management of people with Type 1 Diabetes Mellitus will result in improved patient care. It has been an enormous privilege as the HSE National Clinical Lead for Diabetes to be involved in this update with our colleagues at NCEC and NICE. I would like to acknowledge the tireless efforts of the entire multidisciplinary working group of people with lived experience, advocates, academics and clinicians, led by our excellent chair Dr. Kevin Moore. Finally I would like to sincerely thank all the members of the Diabetes National Clinical Programme team for their valuable expertise and in particular Ms Dervla Kennedy for bringing it all together.

Prof Derek O'Keeffe
Clinical Lead, National Clinical Programme for Diabetes, May 2024.

National Clinical Guidelines

Providing standardised clinical care to patients in healthcare is challenging. This is due to a number of factors, among them diversity in environments of care and complex patient presentations. It is self-evident that safe, effective care and treatment are important in ensuring that patients get the best outcomes from their care.

The Department of Health is of the view that supporting evidence-based practice, through the clinical effectiveness framework, is a critical element of the health service to deliver safe and high-quality care. The National Clinical Effectiveness Committee (NCEC) is a Ministerial committee set up in 2010 as a key recommendation of the report of the Commission on Patient Safety and Quality Assurance (2008). The establishment of the Commission was prompted by an increasing awareness of patient safety issues in general and high-profile health service system failures at home and abroad.

The NCEC on behalf of the Department of Health has embarked on a quality assured National Clinical Guideline development process linked to service delivery priorities. Furthermore, implementing National Clinical Guidelines sets a standard nationally, to enable healthcare professionals to deliver safe and effective care and treatment while monitoring their individual, team and organisation's performance.

The aim of these National Clinical Guidelines is to reduce unnecessary variations in practice and provide an evidence base for the most appropriate healthcare in particular circumstances. As a consequence of Ministerial mandate, it is expected that NCEC National Clinical Guidelines are implemented across all relevant services in the Irish healthcare setting.

The NCEC is a partnership between key stakeholders in patient safety. NCEC's mission is to provide a framework for national endorsement of clinical guidelines and clinical audit to optimise patient and service user care. The NCEC has a remit to establish and implement processes for the prioritisation and quality assurance of clinical guidelines and clinical audit so as to recommend them to the Minister for Health to become part of a suite of National Clinical Guidelines and National Clinical Audit. The aim of the suite of National Clinical Guidelines is to provide guidance and standards for improving the quality, safety and cost-effectiveness of healthcare in Ireland. The implementation of these National Clinical Guidelines will support the provision of evidence-based and consistent care across Irish healthcare services.

NCEC Terms of reference

1. Provide strategic leadership for the national clinical effectiveness agenda.
2. Contribute to national patient safety and quality improvement agendas.
3. Publish standards for clinical practice guidance.
4. Publish guidance for National Clinical Guidelines and National Clinical Audit.
5. Prioritise and quality assure National Clinical Guidelines and National Clinical Audit.
6. Commission National Clinical Guidelines and National Clinical Audit.
7. Align National Clinical Guidelines and National Clinical Audit with implementation levers.
8. Report periodically on the implementation and impact of National Clinical Guidelines and the performance of National Clinical Audit.
9. Establish sub-committees for NCEC work streams.
10. Publish an annual report.

National Institute for Health and Clinical Excellence

NICE National Institute for Health and Care Excellence

The National Institute for Health and Care Excellence (NICE) provides evidence-based guidance and advice to improve health and social care.

NICE's Centre for Guidelines develops guidance on the promotion of good health; the prevention of ill health; the appropriate treatment and care for people with specific diseases and conditions; social care and service delivery. The guidelines are evidence-based recommendations for health and care in England on a wide range of topics, from preventing and managing specific conditions to planning broader services and interventions to improve the health of communities; and are used by those working in the UK National Health Service, local government, social care, patients and their families. NICE has published over 300 guidelines since 2002.

Since 2014, NICE has worked with international clients wishing to rapidly contextualise NICE guidelines for their local populations and health care context infrastructure. The process involves a local guideline committee who consider and contextualise NICE's original recommendations before consultation with relevant stakeholders. NICE quality assures the contextualisation process to ensure the published guidelines meet internationally-recognised standards of best practice, and are also relevant to local contexts.

In 2017 an agreement was reached between NICE and the National Patient Safety Office's Clinical Effectiveness Unit, on behalf of the NCEC to work together on the contextualisation of NICE's clinical guideline, (NG17) Type 1 diabetes in adults: diagnosis and management (2015), resulting in the publication in June 2018 of NCEC NCG 17, Adult Type 1 Diabetes. In 2023, a project to complete a rapid update of the 2018 NCEC guideline in line with corresponding 2021 and 2022 updates to the NICE guideline was initiated. This culminated in the publication of the updated NCEC NCG 17, in May 2024.

Table of Contents

1 National Clinical Guideline recommendations

1.1 Key Recommendations[1]

The full list of recommendations are in section 3.

Continuous glucose monitoring [new 2024]

- Offer adults with type 1 diabetes a choice of real-time continuous glucose monitoring (rtCGM) or intermittently scanned continuous glucose monitoring (isCGM, commonly referred to as 'flash'), based on their individual preferences, needs, characteristics, and the functionality of the devices available.
- When choosing a continuous glucose monitoring (CGM) device, use shared decision making to identify the person's needs and preferences, and offer them an appropriate device.
- CGM should be provided by a team with expertise in its use, as part of supporting people to self-manage their diabetes.
- Advise adults with type 1 diabetes who are using CGM that they will still need to take capillary blood glucose measurements (although they can do this less often). Provide them with enough test strips to take capillary blood glucose measurements, as needed.
- If a person cannot use or does not want rtCGM or isCGM, offer capillary blood glucose monitoring.
- Include CGM in the structured education programme provided to all adults with type 1 diabetes and ensure that people are empowered to use CGM.
- Monitor and review the person's use of CGM as part of reviewing their diabetes care plan.

[1] Refer to section 2.9 for a description on the strength of recommendations made

Education and information

- Offer all adults with type 1 diabetes a structured education programme of proven benefit, for example the DAFNE (dose-adjustment for normal eating) programme. Offer this programme 6–12 months after diagnosis.

Blood glucose management

- Support adults with type 1 diabetes to aim for a target HbA1c level of 48 mmol/mol (6.5%) or lower, to minimise the risk of long-term vascular complications.
- Agree an individualised HbA1c target with each adult with type 1 diabetes, taking into account factors such as the person's daily activities, aspirations, likelihood of complications, comorbidities, occupation and history of hypoglycaemia.
- Support adults with type 1 diabetes who are using capillary blood glucose monitoring to measure at least 4 times a day, and up to 10 times a day:
  - if their target for blood glucose control, measured by HbA1c level (see recommendation 3.6.6), is not reached
  - if they are having more frequent hypoglycaemic episodes
  - if there is a legal requirement to do so, such as before driving (see the National Office for Traffic Medicine (NOTM) Medical Fitness to Drive Guidelines (2022))
  - during periods of illness
  - before, during and after sport
  - when planning pregnancy, during pregnancy and while breastfeeding (see the HSE (2010) Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus, HSE/RCPI Diabetes in Pregnancy: A Model of Care for Ireland (2024), and NICE Guideline NG3:Diabetes in pregnancy: management from preconception to the postnatal period).
  - if they need to know their blood glucose levels more than 4 times a day for other reasons (for example, impaired hypoglycaemia awareness, or they are undertaking high-risk activities). **[updated 2024]**
- Advise adults with type 1 diabetes to aim for:
  - a fasting plasma glucose level of 5–7 mmol/litre on waking and
  - a plasma glucose level of 4–7 mmol/litre before meals at other times of the day.

Insulin therapy

- Offer multiple daily injection basal–bolus insulin regimens, rather than twice-daily mixed insulin regimens, as the insulin injection regimen of choice for all adults with type 1 diabetes. Provide the person with guidance on using multiple daily injection basal-bolus insulin regimens.

Awareness and management of hypoglycaemia

- Assess awareness of hypoglycaemia in adults with type 1 diabetes at each annual review.

Care of adults with type 1 diabetes in hospital

- Enable adults with type 1 diabetes who are hospital inpatients to self-administer subcutaneous insulin if they are willing and able and it is safe to do so.

1.2 Key priorities for implementation

- To provide access to continuous glucose monitoring for all patients with type 1 diabetes, in accordance with the HSE Managed Access Programme. **[new 2024]**
- To provide access to high quality structured patient education programme for eligible adults with type 1 diabetes in Ireland 6 – 12 months after diagnosis or at another appropriate time
- To measure HbA1c levels every 3–6 months in adults with type 1 diabetes. To facilitate implementation, provide access to a minimum of 2 consultations with a diabetes healthcare provider per year for all adults with type 1 diabetes.

2 Development of the National Clinical Guideline

2.1 Background

Type 1 diabetes is an autoimmune condition that causes destruction of the insulin producing cells in the pancreas. As a result of the loss of insulin production, people with type 1 diabetes must administer subcutaneous insulin in order to manage their blood glucose. Type 1 diabetes is a challenging condition to manage. Successful management of diabetes requires motivation, education, knowledge, frequent glucose monitoring and careful insulin administration. In addition to administering insulin, people with type 1 diabetes must monitor their blood glucose concentrations multiple times a day, and their intake of carbohydrates accordingly. A key goal of diabetes management is to keep the glucose values in recommended targets (time in range), in order to minimize the risk of acute (hypoglycaemia, diabetic ketoacidosis (DKA)) and long-term complications. Given the complexity of maintaining time in range, successful outcomes depend, perhaps more than with any other long-term condition, on full engagement of the adult with type 1 diabetes in life-long day-to- day self-management. In order to support this, the health service needs to provide informed, expert support, education and training as well as a range of other more conventional biomedical services and interventions for the prevention and management of long term complications, including access to technologies proven to improve diabetes management and the quality of life (e.g. continuous glucose monitoring, continuous subcutaneous insulin infusion and automated insulin delivery systems). People with type 1 diabetes require significant input from their diabetes multidisciplinary teams in order to ensure that they have the necessary knowledge and skills required to successfully manage their condition, utilise diabetes technology, and minimise the risk of the potential complications of diabetes. A hospital diabetes multidisciplinary team should comprise, at the minimum, of a consultant diabetologist, clinical nurse specialist/advanced nurse practitioner, a diabetes dietitian, and a diabetes podiatrist. There should also be access to a Clinical psychologist who is experienced/knowledgeable about type 1 diabetes.

It is estimated that there are between 20,000-30,000 adults with type 1 diabetes living in the Republic of Ireland, but the accurate/reliable statistics are lacking due to the absence of a diabetes registry. The care of these patients with type 1 diabetes has been delivered by diabetes multidisciplinary teams located in secondary and tertiary care centres across the country. Up until 2018, Ireland did not have a clinical guideline for the management of adult patients with type 1 diabetes and there was very limited knowledge of the quality of care or the clinical outcomes for people with type 1 diabetes living in Ireland. The development of that 2018 national clinical guideline provided the diabetes multidisciplinary team, patients and the HSE with a framework that ensured that adults with type 1 diabetes had equitable access to high quality care, thus improving patient's outcomes and reducing diabetes complications. This updated guideline ensures that the recommendations are in keeping with current best clinical practice.

2.2 Clinical and financial impact of type 1 diabetes

The complications of type 1 diabetes can result in disability including vision loss, kidney failure and foot ulceration leading to amputation, as well as premature heart disease and stroke. The morbidity associated with these complications can have a devastating impact on quality of life and generate a significant cost to the State.

A systematic review and meta-analysis which included studies with people living with type 1 diabetes in Ireland showed the prevalence of diabetes complications ranged widely depending on study population and methodology used (6.5–25.2 % retinopathy; 3.2–32.0 % neuropathy; 2.5-5.2 % nephropathy) (Tracey et al, 2016). However this review highlighted a number of limitations in interpretation of available data due to inconsistencies in reporting, limited availability of objective data and lack of standardisation in diagnostic criteria (Tracey et al, 2016). Research from an Irish cohort suggests that the prevalence of diabetic kidney disease is 23.4% in people with Type 1 Diabetes (Griffin et al. 2021). Another Irish study showed the average glycaemic control in a population of young adults (18–25 years old) with type 1 diabetes was poor at 81mmols/mol and diabetes related complications were present in 32% of this young adult population (Casey et al, 2014).

In 2016, the Hospital In-Patient Enquiry Scheme (HIPE) reported 1,959 hospital discharges for type 1 diabetes-associated complications including hyperosmolar state, ketoacidosis, kidney complications, ophthalmic and neurological conditions. The association between having diabetes and mental health difficulties is strong and consistent across different settings (Thomas et al, 2003; Golden et al, 2008). Depression is a common finding among people with diabetes, with an average prevalence of 10%, and increases in incidence as the burden and disability from diabetes complications progresses. When individuals who are not reaching glycaemic targets are formally assessed by liaison mental health teams, previously undiagnosed psychiatric disorders such as depression, borderline personality traits, and eating disorders sometimes emerge (Doherty et al, 2016).

Data from the UK estimates 10% of the entire health budget is spent on diabetes and related complications, this is projected to rise to around 17% in 2035/2036 (Hex et al, 2012). A study by Sharma et al. (2022) stated that Type 1 diabetes was estimated to cost €129 million in Ireland in 2018, with direct healthcare costs accounting for €81.5 million or 63% and indirect costs for €47.5 million or 37% of the total. On average, this amounted to €3994 per patient in direct healthcare costs and €2326 per patient in indirect costs. The CODEIRE study assessed the cost of type 2 diabetes in Ireland and, in keeping with international literature, demonstrated that diabetes is costly and that much of the cost relates to managing the complications of diabetes (Nolan et al, 2006). It is over 20 years since the publication of the Diabetes Control and Complications Trial (DCCT), which proved beyond doubt that intensive glucose management in people living with type 1 diabetes reduces the risk of microvascular and neuropathic complications. Realising this goal remains challenging at the level of the individual patient and across the health service. If the recommendations in the Guideline are implemented, then Ireland should be closer to achieving improved clinical outcomes and quality of life for people living with type 1 diabetes.

2.3 Rationale for this National Clinical Guideline

In the absence of a National Diabetes Register it is estimated that there are 20,000-30,000 adults in Ireland living with type 1 diabetes, representing approximately 10% of adults diagnosed with diabetes. People living with type 1 diabetes need to be provided with the necessary knowledge and tools in order to successfully self-manage their condition. The HSE National Framework and Implementation Plan for Self-management Support for Chronic Conditions: COPD, Asthma, Diabetes and Cardiovascular Disease published in 2017 supports a collective shift in emphasis toward creating enabling, supportive and transformative environments that put the patient first, realising the value of active participation and effective collaborative interactions between patients and healthcare staff. It acknowledges that supporting people to self-manage their health conditions through systematic provision of education and supportive interventions increases their skills and confidence and improves outcomes for patients (HIQA 2015, Panagioti et al, 2014).

In many health services (including Germany and the UK) care for individuals living with type 1 diabetes incorporates the delivery of high quality self-management education, usually in a group setting. Many of these self-management education programmes have demonstrated improvement in diabetes management, quality of life and diabetes knowledge. Access to the DAFNE structured diabetes education programme has improved significantly in Ireland following investment in staff from the Integrated Care Programme for Chronic Disease. Between 2016 and 2023 the number of DAFNE sites has increased from 6 to 18 public and 2 private centres - now spread across all 6 Health Regions. There have been over 190 courses delivered with 1100 graduates during that time (Breen et al, 2023).

Current evidence shows the care of people with diabetes varies across Ireland. Care may be limited, unstructured and ad-hoc in some locations with limited access to specialist expert diabetes opinion in secondary care. In 2018, only 42% of hospital diabetes services were offering adults with uncomplicated type 1 diabetes the recommended six monthly review appointments. Instead many patients are offered only infrequent appointments focused on annual review (HSE NCP National Survey of Diabetes Care Delivery by Acute Hospitals Division, 2018).

In 2018, Ireland contextualized NICE clinical guidelines for the management of adult patients with type 1 diabetes. The National Clinical Programme for Diabetes together with the NCEC recognised that the NICE guideline (NG17) Type 1 diabetes in adults: diagnosis and management (2015) offered an opportunity to work with an up-to-date, well prepared guideline. This allowed the development of an Irish guideline that was created with a similar patient population and health system in mind. It was hoped that the publication of that guideline would be a driver to standardise care nationally and as a result patient outcomes would improve and the incidence of diabetes related complications decrease. The development of that guideline allowed a structured review and evaluation against explicit standards of care to identify gaps in service and help targeted improvements in patient care and outcomes. This updated guideline ensures that the recommendations are in keeping with current best clinical practice.

2.4 Aim and objectives

The aim of this guideline is to provide evidence-based, practical advice on the steps necessary to support adults with type 1 diabetes to live full lives and avoid the acute and long-term complications of both the disease and its treatment. This evidence-based clinical guideline will provide a practical approach to promote the implementation of cost-effective evidence-based care nationally. This will improve health outcomes for patients, reduce variation in practice and improve the quality of clinical decisions that patients and healthcare staff make together. A National Clinical Guideline will inform patients about the care they should be receiving and assist them to make healthcare choices based on best available information.

2.5 Guideline scope

Groups that will be covered

- Adults (aged 18 years and older) with type 1 diabetes.

Groups that will not be covered

- Children with type 1 diabetes. This is addressed in the HSE (2015) Model of Care for All Children and Young Adults with Type 1 Diabetes and HSE Transition from Paediatric to Young Adult Diabetes Care Guidelines (awaiting publication).
- Adults with type 2 diabetes. This is addressed in the HSE (2018) Model of Integrated Care for Type 2 Diabetes and the ICGP (2016) Practical Guide to Integrated Type 2 Diabetes Care.
- Diabetes in pregnancy. This is addressed in the HSE (2010) Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus and the NICE guideline NG3, Diabetes in pregnancy: management from preconception to the postnatal period.
- Monogenic and other rarer forms of diabetes

Healthcare setting

All settings in which people living with type 1 diabetes is receive care.

2.6 Conflict of interest statement

The guideline development group adhered to the conflict of interest policy set out by NCEC. All members of the group completed the required Conflict of Interest Declaration form which were submitted to the NCP Diabetes Programme Manager and reviewed by the chair. No interests stated were deemed to be conflicts in relation to the recommendations of this guideline.

2.7 Sources of funding

The NICE contextualisation process was funded by the Department of Health as a pilot to facilitate guideline development. The economic review and the budget impact analysis for the guideline was carried out by the Health Research Board Collaboration in Ireland for Clinical Effectiveness Reviews (HRB-CICER). The 2024 Rapid Update contextualisation process with NICE was again funded by the Department of Health.

2.8 Guideline methodology

A literature search for international guidelines for type 1 diabetes was conducted on the Guidelines International Network, International Guideline Library database in October 2016. 21 international guidelines were identified that met the search criteria. Guidelines were excluded if they were not yet published, if they were over 5 years old, related only to type 2 diabetes or were not available in English. When this exclusion criteria was applied, only two sets of guidelines were eligible for consideration:

- NICE 2015 type 1 diabetes in adults: diagnosis and management guideline
- Type 1 diabetes through the life span: a position statement of the American Diabetes Association 2014

The programme convened a Guideline Development Group (GDG) of recognised experts and clinical leaders having invited representation from the main professional bodies of the diabetes multidisciplinary team. After discussion with the GDG and following a wider consultative consensus day with all stakeholders involved it was agreed to develop a National Clinical Guideline through the Department of Health's NCEC. To demonstrate the high quality and reporting of the NICE guideline a quality assessment was conducted using the Appraisal of Guidelines for Research and Evaluation II (AGREE II) (Brouwers et al, 2010) tool by two members of the GDG. The NICE guideline ranked very highly with appraiser scores in all domains, overall percentages were 86-90%, and both appraisers recommended this guideline for use. The NCEC prioritised this clinical guideline in February 2017 following submission of a proposal document by the GDG in December 2016. The ADAPTE (2009) and NICE contextualisation processes were considered. The programme together with the NCEC recognised the potential value of contextualising the NICE guideline Type 1 diabetes in adults: diagnosis and management (NG17) to an Irish guideline and engaged with NICE. This is the first time NCEC have undertaken a contextualisation process and only the second time NICE have worked with a country outside of the United Kingdom.

NICE contextualisation is a process whereby an external agency can contextualise certain NICE guidelines for a different jurisdiction. A licensing agreement was required and was negotiated between NICE and the NCEC. Funding was provided by the Department of Health. The GDG were responsible for reviewing the NICE guideline and recommending to the NICE Guideline Contextualisation Quality Assurance Team any change deemed necessary for the Irish context. The evidence base for the guideline being contextualised was not reviewed and/or updated. Where changes / updates were felt to be necessary / beneficial and have been agreed with the NICE Guideline Contextualisation QA Team, the appropriate references are included. The guideline provides recommendations for good practice that are based on the best available evidence of clinical and cost effectiveness.

In the original 2018 guideline, the next stage in the development process was a public consultative process, which is described above. Following this consultation period, feedback was reviewed by the GDG and incorporated into the document if deemed appropriate to produce a guideline relevant to the Irish population, which we hope will be welcomed by those who manage and experience diabetes care in Ireland. The 2024 guideline rapid update adds to methods outlined in the 2018 guideline for achieving optimal outcomes for adults with type 1 diabetes to inform service design and delivery. Its intended audience includes healthcare professionals involved in delivering services to adults with type 1 diabetes, service managers and adults with type 1 diabetes and their families.

The 2018 guideline implementation plan and budget impact analysis (BIA) were developed independent of NICE. The BIA was developed by HRB-CICER in conjunction with members of the GDG (see Section 2.15). The development of the implementation plan was the sole responsibility of the GDG. To assist with this process members of the GDG attended training and follow up workshops provided by the Centre for Effective Services (CES) through the NCEC (see Section 2.14). The implementation plan for the 2024 rapid update is included appendix 4.

2.9 Strength of NICE Recommendations

The concept of the 'strength' of a recommendation is key to translating evidence into recommendations. This takes into account the quality of the evidence but is conceptually different.

If the committee believes that the vast majority of practitioners or commissioners and people using services would, based on the evidence seen by the committee, choose a particular intervention, they make a strong recommendation for the intervention. This is generally the case if the benefits clearly outweigh the harms for most people and the intervention is likely to be cost effective. If the opposite is true, they make a strong recommendation against the intervention.

In 'strong' recommendations for actions that should (or should not) be offered, NICE uses directive language such as 'offer' (or 'do not offer'), 'advise', or 'ask about'. In keeping with the principles of shared decision making, people may choose whether or not to accept what they are offered or advised.

If the committee concludes, based on the evidence, that there is a closer balance between benefits and harms, and some people would not choose an intervention whereas others would, they make a weak recommendation for the intervention. If there is a closer balance between benefits and harms (activities or interventions that could be used), NICE uses 'consider' to reflect that the recommendation is 'weak'.

NICE uses 'must' or 'must not' only if there is a legal duty or there may be serious consequences to not following the recommendation. All NICE guidelines advocate the principles of person-centred care: people using services and the wider public should be informed of their options and be involved in decisions about their care. NICE guidelines are written to support shared decision making between the person and their health or social care practitioner (see also 'Patient-centred care' section 2.10).

For more information on how NICE interprets evidence and writes recommendations see chapter 9 in Developing NICE guidelines: the manual.

2.10 Patient Centred Care

This guideline offers best practice advice on the care of adults with type 1 diabetes. Patients and healthcare professionals have rights and responsibilities as set out in the Health Information and Quality Authority (HIQA) National Standards for Safer Better Healthcare (2012). Treatment and care should take into account individual needs and preferences. Patients should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. Healthcare professionals should follow the HSE National Consent Policy 2017 for advice on consent. If someone does not have capacity to make decisions, healthcare professionals should follow the Assisted Decision-Making (Capacity) Act 2015 and the HSE (2017) Guide for Health and Social Care Professionals.

2.11 Medicines

The guideline will assume that prescribers will use a medicine's summary of product characteristics to inform decisions made with individual patients. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. The patient (or those with authority to give consent on their behalf) should provide informed consent, which should be documented. Where recommendations have been made for the use of medicines outside their licensed indications ('off-label use'), these medicines are marked with a footnote in the recommendations.

It is important to recognise that the licensing process for drugs regulates the marketing activities of pharmaceutical companies, and not prescribing practice. Use of unlicensed drugs by prescribers is often appropriate and guided by clinical judgment. This practice is safeguarded in legislation in accordance with Medicinal Products (Control of Placing on the Market) Regulations 2007 (S.I. 540/2007) as amended. Furthermore, drugs prescribed outside license can be dispensed by pharmacists and administered by nurses or midwives.

2.12 Consultation summary

The public consultation of the 2018 guideline was advertised on the Royal College of Physicians of Ireland website, via the HSE, Patient Advocacy Groups and social media. Individuals and organisations identified as key stakeholders in the care of type 1 diabetes were also invited to review the guideline and provide feedback. The guideline was made available online on the website of the Royal College of Physicians of Ireland and feedback was submitted on the recommended NCEC template. The consultative period ran from December 18th 2017 until January 12th 2018. Feedback was reviewed by the GDG and the guideline was amended where appropriate, refer to appendices. The contextualisation for the rapid update of the 2024 guideline was coordinated by the GDG.

2.13 External review

Working with NICE has ensured that clinical expertise of UK experts was incorporated into the guideline's development. Further international peer review was not undertaken.

2.14 Implementation

In 2017, a national survey was undertaken to assess current adult type 1 diabetes care delivery by the 31 acute hospitals providing inpatient and ambulatory diabetes services in Ireland. A 100% response rate was achieved and the findings have informed the implementation plan. It was found that many of the guideline recommendations, such as diagnosis, clinical monitoring of glucose control, insulin regimens, and treatment and monitoring of specific complications are already established as part of routine care for patients with type 1 diabetes in Ireland.

There were two key recommendations that were not yet established as routine care and were currently not widely available in Ireland at the time of the publication of the 2018 guideline. The guideline recommends that high quality structured patient education must be incorporated into routine care for all people living with type 1 diabetes. It also recommends the measurement of HbA1c levels every 3–6 months in adults with type 1 diabetes. To facilitate implementation of this guideline there is a requirement to ensure access to high quality structured patient education and access to a minimum of 2 consultations with a diabetes healthcare provider per year for all adults with type 1 diabetes. These recommendations are the primary focus of this guideline implementation plan. A full plan for implementation of this guideline is outlined in Appendix 4 and Logic Model. Funding for implementation of this guideline is subject to service planning and estimates process. The implementation plan for the 2024 update is also included in appendix 4, including access to continuous glucose monitoring.

2.15 Summary of Budget Impact Analysis for the 2018 guideline

A review of the economic literature underpinning the 2015 NICE guideline was undertaken. The full economic evidence review is presented in Annex 1. The review, in line with NICE contextualisation methodology, was constrained to literature identified in the systematic review that informed the 2015 NICE guideline and economic evidence available from within the Irish healthcare context. The evidence presented in the NICE guideline was considered transferrable to the Irish setting, and no conflicting Irish evidence was identified in a full systematic literature search for national evidence.

The full budget impact analysis (BIA) is presented in Annex 2. There are three key changes to service delivery that will occur as a result of implementation of the guideline recommendations and these were considered within the BIA. Firstly, the national provision of a high-quality structured patient education programme to empower people with type 1 diabetes to effectively manage their diabetes and the external factors that can influence their blood glucose levels such as exercise and stress. The Dose Adjustment for Normal Eating (DAFNE) programme is the only structured education programme that is currently available in Ireland that meets all of the criteria of the clinical recommendations regarding structured patient education. At the time of the publication of the 2018 guideline there were seven DAFNE centres in Ireland. The expansion of DAFNE provision would entail the establishment of a maximum of 11 new DAFNE centres following successful implementation, at an estimated cost of €2.9 million over a five year period. This estimate includes the anticipated recruitment costs for additional staff to deliver the programme as well as ongoing running costs and the potential savings due to improved outcomes. Of note, an economic evaluation of the DAFNE programme was performed in the United Kingdom in 2014. The economic evaluation found that DAFNE education was both cost saving and more effective when compared with no DAFNE education. The results, discounted over a lifetime horizon, indicated that DAFNE education would save the National Health Service £1,656 (€2,139 when converted in equivalent Irish Euros) per patient when compared with no DAFNE education. DAFNE education was predicted to reduce the incidence of severe long-term complications such as nephropathy and neuropathy. The results of this economic evaluation were considered to be transferable to the Irish setting. As such, it is anticipated that delivery of the DAFNE programme in Ireland would be a cost-effective use of resources.

Secondly, to ensure implementation of the guideline, short courses for all staff who deliver care to people with type 1 diabetes in Ireland will be provided. The training would be delivered by the staff recruited to deliver the DAFNE programme, and attendance of course participants would be facilitated through existing arrangements for training and development. The estimated budget impact for the short course was approximately €18,000 over five years. An update on the status of the DAFNE programme, as of February 2024, is provided in Appendix 4, Implementation Plan 2024.

Finally, the guideline recommends the standardisation of patient follow-up in diabetes clinics where patients are re-called at least every six months. Survey data from 2018 has indicated that there is substantial variation to practice, with only 42% of hospitals currently offering re-call appointments at this frequency. In order to meet the guideline recommendations an estimated additional 5,000 appointments would need to be provided each year, with an opportunity cost of €3.2 million over five years. However, it is anticipated that the implementation of the HSE (2018) National Model of Integrated Care for Type 2 Diabetes and the ICGP (2016) A Practical Guide to Integrated Type 2 Diabetes Care, which comprises the relocation of care of people with uncomplicated type 2 diabetes from hospital to primary care, could potentially address the capacity constraints within diabetes specialist clinics. A commitment to significant investment in primary care has already been made in the form of the Diabetes Cycle of Care Programme, with almost €11.25 million paid to register and provide structured appointments for patients with type 2 diabetes in 2015 and 2016 alone.

2.16 Monitoring, evaluation and audit

Ireland does not have a National Diabetes Register. It is recognised at present that ICT systems are not in place in Ireland to easily monitor the implementation of the recommendation made in this guideline. Such deficits represent a significant barrier to improving diabetes care for individuals living with diabetes in Ireland. In other countries where registers are maintained as part of care delivery reporting of outcomes of care such as average levels of HbA1c happens routinely (McKnight et al, 2015). Achieving the goal of developing and maintaining a National Diabetes Register will require commitment and buy- in from many stakeholders.

The National Clinical Programme for Diabetes is keen to demonstrate the benefits of developing and maintaining a register for individuals living with type 1 diabetes. Most individuals living with type 1 diabetes attend hospital services for their care. In a National Survey of Diabetes Care Delivery by Acute Hospitals the programme established that although 18 out of 31 hospitals reported having a diabetes register of existing patients or a diabetes management system that would allow them to generate a list of diabetes patients, only 8 of 31 acute hospitals reported that the number of type 1 diabetes patients attending their service were based on accurate figures.

Qualitative data collected as part of a National Survey (2018) and NCP Diabetes national audit would suggest that there is frustration among hospital teams that do not have access to a diabetes information system. The experience in other countries would strongly suggest that if a National Register/Audit of Care can be initiated then the resultant data will generate many important questions for future audit, research and most importantly improvements in patient care. While we wait for the necessary ICT infrastructure and national diabetes audit, progress can be monitored in individual diabetes units. Each unit will be encouraged to conduct annual audits of attendance, clinical outcomes such as HbA1c and rates of screening for complications. The expansion of structured patient education programmes will be co-ordinated by the NCP Diabetes with the assistance of the National Patient Education Co-ordinator. Administrative staff will be required to co-ordinate the expansion of structured patient education programmes across the country and part of their role will be to maintain and submit all of the relevant data. A National Diabetes Register when developed will use this National Clinical Guideline to set the standard of care for people living with type 1 diabetes, refer to appendices.

2.17 Plan to update this National Clinical Guideline

The guideline will be updated three years from publication as per the process outlined by NCEC. Responsibility for update of the guideline will rest with the HSE National Clinical Programme for Diabetes (or the equivalent depending on the governance structures at the time). If there is a major change in evidence prior to this, a rapid update may be conducted as per NCEC procedures. Due to the contextualisation process, ongoing engagement with NICE will ensure compatibility with its update/ review procedures.

3 National Clinical Guideline recommendations

The following guidance is based on the best available evidence. The NICE full guideline (https://www.nice.org.uk/guidance/ng17/evidence) gives details of the methods and the evidence used to develop the guidance.

Blood glucose and plasma glucose

This guideline refers frequently to circulating glucose concentrations as 'blood glucose'. A lot of the evidence linking specific circulating glucose concentrations with particular outcomes uses 'plasma' rather than 'blood' glucose. In addition, patient-held glucose meters and monitoring systems are all calibrated to plasma glucose equivalents. However, the term 'blood glucose monitoring' is in very common use, so in this guideline we use the term 'blood glucose', except when referring to specific concentration values.

3.1 Diagnosis and early care plan

Diagnosis

3.1.1 Make an initial diagnosis of type 1 diabetes on clinical grounds in adults presenting with hyperglycaemia. Bear in mind that people with type 1 diabetes typically (but not always) have one or more of:

- ketosis
- rapid weight loss
- age of onset below 50 years
- BMI below 25 kg/m2
- personal and/or family history of autoimmune disease. **[updated 2024]**

3.1.2 Do not use age or BMI alone to exclude or diagnose type 1 diabetes in adults. **[updated 2024]**

3.1.3 Take into consideration the possibility of other diabetes subtypes and revisit the diagnosis at subsequent clinical reviews. Carry out further investigations if there is uncertainty (see recommendations 3.1.7 and 3.1.8). **[updated 2024]**

3.1.4 Measure diabetes-specific autoantibodies in adults with an initial diagnosis of type 1 diabetes, taking into account that:

- The false negative rate of diabetes-specific autoantibody tests is lowest at the time of diagnosis
- The false negative rate can be reduced by carrying out quantitative tests for 2 different diabetes-specific autoantibodies (with at least 1 being positive). **[updated 2024]**

3.1.5 Do not routinely measure C-peptide to confirm type 1 diabetes in adults. **[updated 2024]**

3.1.6 In people with a negative diabetes-specific autoantibody result, and if diabetes classification remains uncertain, consider measuring non fasting serum C-peptide (with a paired blood glucose). **[new 2024]**

Revisiting initial diagnosis

3.1.7 At subsequent clinical reviews, consider using serum C-peptide to revisit the diabetes classification if there is doubt that type 1 diabetes is the correct diagnosis. **[new 2024]**

3.1.8 Take into account that the discriminative value of serum C-peptide to diagnose type 1 diabetes increases the longer the test is done after initial diagnosis of diabetes. **[new 2024]**

3.1.9 For people aged 60 and over presenting with weight loss and new-onset diabetes, follow recommendations on assessing for pancreatic cancer in the section on pancreatic cancer in the NICE guideline on suspected cancer: recognition and referral. **[new 2024]**

Early care plan

3.1.10 At the time of diagnosis (or if necessary after the management of critically decompensated metabolism), the diabetes professional team should develop with and explain to the adult with type 1 diabetes a plan for their early care. To agree such a plan will generally require:

- medical assessment to:
  - ensure security of diagnosis of type of diabetes
  - ensure appropriate acute care is given when needed
  - review and detect potentially confounding disease and medicines
  - detect adverse vascular risk factors
- environmental assessment to understand:
  - the social, home, work and recreational circumstances of the person and carers
  - their preferences in nutrition and physical activity
  - other relevant factors, such as substance use
- cultural and educational assessment to identify prior knowledge and to enable optimal advice and planning about:
  - treatment modalities
  - diabetes education programmes
- assessment of emotional state to determine the appropriate pace of education.

The results of the assessment should be used to agree a future care plan. Some items of the initial diabetes assessment:

- acute medical history
- social, cultural and educational history/lifestyle review
- complications history/symptoms
- long-term/recent diabetes history
- other medical history/systems
- family history of diabetes/cardiovascular disease
- medication history/current medicines

- vascular risk factors
- smoking
- general examination
- weight/BMI
- foot/eye/vision examination
- urine albumin:creatinine ratio (ACR) and estimated glomerular filtration rate (eGFR)
- psychological wellbeing
- attitudes to medicine and self-care
- immediate family and social relationships and availability of informal support. **[updated 2024]**

3.1.11 Elements of an individualised and culturally appropriate plan will include:

- sites and timescales of diabetes education, including nutritional advice (see sections 3.3 and 3.4)
- initial treatment modalities, including guidance on insulin injection and insulin regimens (see sections 3.7 and 3.8)
- means of self-monitoring and targets (see section 3.6)
- symptoms, risk and treatment of hypoglycaemia
- management of special situations, such as driving
- means and frequency of communication with the diabetes professional team
- management of cardiovascular risk factors (see section 3.13)
- for women of childbearing potential, implications for pregnancy and family planning advice see the HSE (2010) Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus, HSE/RCPI Diabetes in Pregnancy: A Model of Care for Ireland (2024), and NICE Guideline NG3:Diabetes in pregnancy: management from preconception to the postnatal period.
- frequency and content of follow-up consultations, including review of HbA1c levels and experience of hypoglycaemia, and annual review.

3.1.12 After the initial plan is agreed, put arrangements in place to implement it without inappropriate delay, and to provide for feedback and modification of the plan over the ensuing weeks.

3.1.13 All patients who are newly diagnosed with diabetes should be registered with the long term illness scheme and the national diabetes retinopathy screening programme

3.2 Support and individualised care

3.2.1 Take account of any disabilities, including visual impairment, when planning and delivering care for adults with type 1 diabetes.

3.2.2 Advice to adults with type 1 diabetes should be provided by a range of professionals with skills in diabetes care working together in a coordinated approach. A common environment (diabetes centre) is an important resource in allowing a diabetes multidisciplinary team to work and communicate efficiently while providing consistent advice.

3.2.3 Provide adults with type 1 diabetes with:

- open-access services on a walk-in and telephone-request basis during normal working hours of Diabetes Day Centre
- contact information for these services

3.2.4 Regard each adult with type 1 diabetes as an individual, rather than as a member of any cultural, economic or health-affected group (see also recommendations 3.4.4 and 3.4.12 about the cultural preferences of individual adults with type 1 diabetes).

3.2.5 Set up an individual care plan jointly agreed with the adult with type 1 diabetes, review it annually and modify it taking into account changes in the person's wishes, circumstances and medical findings, and record the details. The plan should include aspects of:

- diabetes education, including nutritional advice (see sections 3.3 and 3.4)
- insulin therapy, including dose adjustment (see sections 3.8 and 3.9)
- self-monitoring (see section 3.6)
- avoiding hypoglycaemia and maintaining awareness of hypoglycaemia
- management of hypoglycaemia including training of friends and / or family on glucagon administration
- sick day rules, ketone monitoring
- for women of childbearing potential, family planning, contraception and pregnancy planning see the HSE (2010) Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus, HSE/RCPI Diabetes in Pregnancy: A Model of Care for Ireland (2024), and NICE Guideline NG3:Diabetes in pregnancy: management from preconception to the postnatal period.
- cardiovascular risk factor monitoring and management (see section 3.13)
- complications monitoring and management (see section 3.16)
- psychological wellbeing of the person with diabetes
- means and frequency of communicating with the diabetes professional team
- frequency and content of follow-up consultations, including review of HbA1c levels and experience of hypoglycaemia, and next annual review

3.2.6 Use population, practice-based and clinic diabetes registers to assist programmed recall for annual review and assessment of complications and cardiovascular risk.

3.2.7 The multidisciplinary team approach should be available to inpatients with type 1 diabetes, regardless of the reason for admission (see section 3.14).

3.2.8 At the time of diagnosis and periodically thereafter, provide adults with type 1 diabetes with up-to-date information about diabetes support groups (local and national) e.g. Diabetes Ireland, how to contact them and the benefits of membership.

3.3 Education and information

3.3.1 Offer all adults with type 1 diabetes a structured education programme of proven benefit, for example the DAFNE (dose-adjustment for normal eating) programme. Offer this programme 6–12 months after diagnosis.

3.3.2 If a structured education programme has not been undertaken by an adult with type 1 diabetes by 12 months after diagnosis, offer it at any time that is clinically appropriate and suitable for the person, regardless of duration of type 1 diabetes.

3.3.3 Provide an alternative of equal standard for any adult with type 1 diabetes unable or unwilling to participate in group education.

3.3.4 Ensure that any structured education programme for adults with type 1 diabetes includes the following components:

- It is evidence-based, and suits the needs of the person.
- It has specific aims and learning objectives, and supports the person and their family members and carers in developing attitudes, beliefs, knowledge and skills to self-manage diabetes.
- It has a structured curriculum that is theory-driven, evidence-based and resource-effective, has supporting materials, and is written down.
- It is delivered by trained educators who have an understanding of educational theory appropriate to the age and needs of the person, and who are trained and competent to deliver the principles and content of the programme.
- It is quality assured, and reviewed by trained, competent, independent assessors who measure it against criteria that ensure consistency.
- The outcomes are audited regularly.

3.3.5 Explain to adults with type 1 diabetes that structured education is an integral part of diabetes care.

3.3.6 Provide information about type 1 diabetes and its management to adults with type 1 diabetes at all opportunities from diagnosis onwards.

3.3.7 Carry out more formal review of self-care and needs annually in all adults with type 1 diabetes. Vary the agenda addressed each year according to the priorities agreed between the healthcare professional and the adult with type 1 diabetes.

3.3.8 Provide women of childbearing potential with information on the risks associated with pregnancy and the importance of adequate contraception and pre-conception planning (see the HSE (2010) Guidelines for the Management of Pre-gestational and Gestationa Diabetes Mellitus, HSE/RCPI Diabetes in Pregnancy: A Model of Care for Ireland (2024), and NICE Guideline NG3:Diabetes in pregnancy: management from preconception to the postnatal period.

3.4 Dietary management

Carbohydrate counting

3.4.1 Offer carbohydrate-counting training to adults with type 1 diabetes as part of structured education programmes for self-management (see section 3.3).

3.4.2 Consider carbohydrate-counting courses for adults with type 1 diabetes who are waiting for a more detailed structured education programme or are unable to take part in a stand-alone structured education programme.

Dietary advice

3.4.3 Offer dietary advice to adults with type 1 diabetes about issues other than blood glucose control, such as weight control and cardiovascular risk management, as indicated clinically.

3.4.4 Provide nutritional information sensitive to personal needs and culture from the time of diagnosis of type 1 diabetes.

3.4.5 Provide nutritional information individually and as part of a diabetes education programme (see section 3.3). Include advice from a CORU registered dietitian with specific and approved training and continuing accredited education in delivering nutritional advice to people with health conditions. Offer opportunities to receive nutritional advice at intervals agreed between adults with type 1 diabetes and their advising healthcare professionals.

3.4.6 Discuss the glycaemic effects of different foods an adult with type 1 diabetes wishes to eat in the context of the insulin preparations chosen to match those food choices.

3.4.7 Make programmes available to adults with type 1 diabetes to enable them to make:

- optimal choices about the variety of foods they wish to consume
- insulin dose changes appropriate to reduce glucose excursions when taking different quantities of those foods.

3.4.8 Agree the indication for, choice of content, timing and amount of snacks between meals or at bedtime available to the adult with type 1 diabetes, based on informed discussion about the extent and duration of the effects of eating different food types and the insulin preparations available to match them. Modify those choices based on discussion of the results of self-monitoring tests.

3.4.9 Make information available on:

- effects of different alcohol-containing drinks on blood glucose excursions and calorie intake
- use of high-calorie and high-sugar foods.

3.4.10 Make information available about the benefits of healthy eating in reducing cardiovascular risk as part of dietary education in the period after diagnosis, and according to need and interest at intervals thereafter. Include information about fruit and vegetables, types and amounts of fat, and ways of making the appropriate nutritional changes.

3.4.11 Modify nutritional recommendations to adults with type 1 diabetes to take account of associated features of diabetes, including:

- excess weight and obesity
- underweight

- eating disorders
- hypertension
- coeliac disease
- gastroparesis
- renal failure.

3.4.12 Be aware of appropriate nutritional advice on common topics of concern and interest to adults living with type 1 diabetes, and be prepared to seek advice from colleagues with more specialised knowledge. Suggested common topics include:

- body weight, energy balance and obesity management
- cultural and religious diets, feasts and fasts
- foods sold as 'diabetic'
- sweeteners
- dietary fibre intake
- protein intake
- vitamin and mineral supplements
- alcohol
- matching carbohydrate, insulin and physical activity
- salt intake in hypertension
- comorbidities, including nephropathy and renal failure, coeliac disease, cystic fibrosis or eating disorders
- alternative diets e.g. ketogenic diet, very low calorie diet
- use of peer support groups.

3.5 Physical activity

3.5.1 Advise adults with type 1 diabetes that physical activity can reduce their enhanced cardiovascular risk in the medium and longer term.

3.5.2 Give adults with type 1 diabetes who choose to integrate increased physical activity into a more healthy lifestyle information about:

- importance of planning activity
- appropriate intensity and frequency of physical activity
- role of self-monitoring of changed insulin and/or nutritional needs
- effect of activity on blood glucose levels (likely fall) when insulin levels are adequate
- effect of exercise on blood glucose levels when hyperglycaemic and hypoinsulinaemic (risk of worsening of hyperglycaemia and ketonaemia)
- appropriate adjustments of insulin dosage and/or nutritional intake for exercise and post-exercise periods, and the next 24 hours
- interactions of exercise and alcohol
- further contacts and sources of information.

3.6 Blood glucose management

HbA1c measurement and targets

Measurement

3.6.1 Measure HbA1c levels every 3–6 months in adults with type 1 diabetes.

3.6.2 Consider measuring HbA1c levels more often in adults with type 1 diabetes if the person's blood glucose control is suspected to be changing rapidly; for example, if the HbA1c level has risen unexpectedly above a previously sustained target.

3.6.3 Use methods to measure HbA1c that have been calibrated according to International Federation of Clinical Chemistry (IFCC) standardisation.

3.6.4 Inform adults with type 1 diabetes of their HbA1c results after each measurement and ensure that their most recent result is available at the time of consultation.

3.6.5 If HbA1c monitoring is invalid because of disturbed erythrocyte turnover or abnormal haemoglobin type, estimate trends in blood glucose control using one of the following:

- fructosamine estimation
- quality-controlled blood glucose profiles
- total glycated haemoglobin estimation (if abnormal haemoglobins).

Targets

3.6.6 Support adults with type 1 diabetes to aim for a target HbA1c level of 48 mmol/mol (6.5%) or lower, to minimise the risk of long-term vascular complications.

3.6.7 Agree an individualised HbA1c target with each adult with type 1 diabetes, taking into account factors such as the person's daily activities, aspirations, likelihood of complications, comorbidities, occupation and history of hypoglycaemia.

3.6.8 Ensure that aiming for an HbA1c target is not accompanied by problematic hypoglycaemia in adults with type 1 diabetes.

3.6.9 Diabetes services should document the proportion of adults with type 1 diabetes in a service who achieve an HbA1c level of 53 mmol/mol (7%) or lower.

Continuous glucose monitoring

3.6.10 Offer adults with type 1 diabetes a choice of real-time continuous glucose monitoring (rtCGM) or intermittently scanned continuous glucose monitoring (isCGM, commonly referred to 'flash'), based on their individual preferences, needs, characteristics, and the functionality of the devices available. See box 1 for examples of factors to consider as part of this discussion. **[new 2024]**

3.6.11 When choosing a continuous glucose monitoring (CGM) device:

- use shared decision making to identify the person's needs and preferences, and offer them an appropriate device.
- if multiple devices meet their needs and preferences, offer the device with the lowest cost. **[new 2024]**

Box 1: Factors to consider when choosing a continuous glucose monitoring device [new 2024]:

- Accuracy of the device
- Whether the device provides predictive alerts or alarms and if these need to be shared with anyone else (for example, a carer)
- Whether using the device requires access to particular technologies (such as a smartphone and up-to-date phone software)
- How easy the device is to use and take readings from, including for people with limited dexterity
- Fear, frequency, awareness and severity of hypoglycaemia
- Psychosocial factors
- The person's insulin regimen or type of insulin pump, if relevant (taking into account whether a particular device integrates with their pump as part of a hybrid closed loop or insulin suspend function)
- Whether, how often, and how the device needs to be calibrated, and how easy it is for the person to do this themselves
- How data can be collected, compatibility of the device with other technology, and whether data can be shared with the person's healthcare provider to help inform treatment
- Whether the device will affect the person's ability to do their job
- How unpredictable the person's activity and blood glucose levels are and whether erratic blood glucose is affecting their quality of life
- Whether the person has situations when symptoms of hypoglycaemia cannot be communicated or can be confused (for example, during exercise)
- Clinical factors that may make devices easier or harder to use
- Frequency of sensor replacement
- Sensitivities to the device, for example local skin reactions
- Body image concerns

3.6.12 CGM should be provided by a team with expertise in its use, as part of supporting people to self-manage their diabetes. **[new 2024]**

3.6.13 Advise adults with type 1 diabetes who are using CGM that they will still need to take capillary blood glucose measurements (although they can do this less often). Explain that this is because:

- they will need to use capillary blood glucose measurements to check the accuracy of their CGM device
- they will need capillary blood glucose monitoring as a back-up (for example, when their blood glucose levels are changing quickly or if the device stops working).

Provide them with enough test strips to take capillary blood glucose measurements as needed. **[new 2024]**

3.6.14 If a person cannot use or does not want rtCGM or isCGM, offer capillary blood glucose monitoring. **[new 2024]**

3.6.15 Include CGM in the structured education programme provided to all adults with type 1 diabetes (see the section on education and information) and ensure that people are empowered to use CGM devices (see the section on empowering people to self-monitor blood glucose). **[new 2024]**

3.6.16 Monitor and review the person's use of CGM as part of reviewing their diabetes care plan (see recommendations 3.1.10, 3.1.11, and 3.2.5 on what to consider when agreeing a care plan and what a care plan should cover). **[new 2024]**

3.6.17 If there are concerns about the way a person is using the CGM device:

- ask if they are having problems using their device
- look at ways to address any problems or concerns to improve their use of the device, including further education and emotional and psychological support.

For guidance on CGM for pregnant women, see the NICE guideline NG3:Diabetes in pregnancy: management from preconception to the postnatal period. **[new 2024]**

3.6.18 Healthcare management and clinicians should address inequalities in CGM access and uptake by:

- monitoring who is using CGM
- identifying groups who are eligible but who have a lower uptake
- making plans to engage with these groups to encourage them to consider CGM. **[new 2024]**

The Health Information and Quality Authority (HIQA) has published a rapid health technology assessment (HTA) on the use of continuous glucose monitoring (CGM) systems in adults with type 1 diabetes (2023) which has informed the updates in this section. The HTA recommended the establishment of a single managed access programme for all CGM systems for all individuals with T1DM regardless of age. The HSE has established a Managed Access Programme for CGM.

Self Monitoring of blood glucose

Frequency of self-monitoring of blood glucose

3.6.19 Advise adults with type 1 diabetes who are using capillary blood glucose monitoring to routinely self-monitor their blood glucose levels, and to measure at least 4 times a day (including before each meal and before bed). **[updated 2024]**

3.6.20 Support adults with type 1 diabetes who are using capillary blood glucose monitoring to measure at least 4 times a day, and up to 10 times a day:

- if their target for blood glucose control, measured by HbA1c level (see recommendation 3.6.6), is not reached
- if they are having more frequent hypoglycaemic episodes
- if there is a legal requirement to do so, such as before driving (see the National Office for Traffic Medicine (NOTM) Medical Fitness to Drive Guidelines (2022))
- during periods of illness
- before, during and after sport
- when planning pregnancy, during pregnancy and while breastfeeding (see the HSE (2010) Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus and NICE Guideline NG3: Diabetes in pregnancy: management from preconception to the postnatal period.
- if they need to know their blood glucose levels more than 4 times a day for other reasons (for example, impaired hypoglycaemia awareness, or they are undertaking high-risk activities). **[updated 2024]**

3.6.21 Enable additional blood glucose measurement (more than 10 times a day) for adults with type 1 diabetes who are using capillary blood glucose monitoring if this is necessary because of:

- the person's lifestyle (for example, they drive for long periods of time, they undertake high-risk activities or have a high-risk occupation, or they are travelling) or
- impaired hypoglycaemia awareness. **[updated 2024]**

Blood glucose targets

3.6.22 Advise adults with type 1 diabetes to aim for:

- a fasting plasma glucose level of 5–7 mmol/litre on waking and
- a plasma glucose level of 4–7 mmol/litre before meals at other times of the day.

3.6.23 Advise adults with type 1 diabetes who chose to test after meals to aim for a plasma glucose level of 5-9 mmol/litre at least 90 minutes after eating. This timing may be different in pregnancy – for guidance on plasma glucose targets in pregnancy see the HSE (2010) Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus, HSE/RCPI Diabetes in Pregnancy: A Model of Care for Ireland (2024), and NICE Guideline NG3:Diabetes in pregnancy: management from preconception to the postnatal period.

3.6.24 Agree bedtime target plasma glucose levels with each adult with type 1 diabetes that take into account timing of the last meal and its related insulin dose, and are consistent with the recommended fasting level on waking (see recommendation 3.6.22).

Empowering people to self-monitor blood glucose

3.6.25 Teach self-monitoring skills at the time of diagnosis and initiation of insulin therapy.

3.6.26 When choosing blood glucose meters:

- take the needs of the adult with type 1 diabetes into account
- ensure that meters meet current ISO standards.

3.6.27 Educate adults with type 1 diabetes about how to measure their blood glucose level, interpret the results and know what action to take. Review these skills at least annually. Patients should be aware of potential sources of blood glucose meter errors, appropriate quality control techniques and need for meter replacement every 2 years.

3.6.28 Support adults with type 1 diabetes to make the best use of data from self-monitoring of blood glucose through structured education (see recommendations 3.3.1 and 3.3.2).

Sites for self-monitoring of blood glucose

3.6.29 Monitoring blood glucose using sites other than the fingertips cannot be recommended as a routine alternative to conventional self-monitoring of blood glucose.

3.7 Insulin therapy

Insulin regimens

3.7.1 Offer multiple daily injection basal–bolus insulin regimens, rather than twice-daily mixed insulin regimens, as the insulin injection regimen of choice for all adults with type 1 diabetes. Provide the person with guidance on using multiple daily injection basal–bolus insulin regimens.

3.7.2 Do not offer adults newly diagnosed with type 1 diabetes non-basal–bolus insulin regimens (twice-daily mixed, basal only or bolus only).

Long-acting insulin

3.7.3 Offer twice-daily insulin detemir as basal insulin therapy for adults with type 1 diabetes.

3.7.4 Consider 1 of the following as an alternative basal insulin therapy to twice-daily insulin detemir for adults with type 1 diabetes:

- an insulin regimen that is already being used by the person if it is meeting their agreed treatment goals (such as meeting their HbA1c targets or time in target glucose range and minimising hypoglycaemia)
- once-daily insulin glargine (100 units/ml) if insulin detemir is not tolerated or the person has a strong preference for once-daily basal injections
- once-daily insulin degludec (100 units/ml) if there is a particular concern about nocturnal hypoglycaemia
- once-daily ultra-long-acting insulin such as degludec (100 units/ml) for people who need help from a carer or healthcare professional to administer injections.

There is a risk of severe harm and death due to inappropriately withdrawing insulin from pen devices. See HPRA communications for further information. **[updated 2024]**

3.7.5 When starting an insulin for which a biosimilar is available, use the product with the lowest acquisition cost. **[new 2024]**

3.7.6 Ensure the risk of medication errors with insulins is minimised by following Health Products Regulatory Authority (HPRA) guidance and European Medicines Agency (EMA) guidance on minimising the risk of medication error with high strength and fixed combination insulin products. **[new 2024]**

3.7.7 When people are already using an insulin for which a lower cost biosimilar is available, discuss the possibility of switching to the biosimilar. Make a shared decision with the person after discussing their preferences. **[new 2024]**

3.7.8 Consider other basal insulin regimens for adults with type 1 diabetes only if the regimens in recommendation 3.7.3 and 3.7.4 do not deliver agreed targets. When choosing an alternative insulin regimen, take account of:

- the person's preferences
- comorbidities
- risk of hypoglycaemia and diabetic ketoacidosis
- any concerns around adherence
- acquisition cost. **[new 2024]**

3.7.9 When prescribing, ensure that insulins are prescribed by brand name. **[new 2024]**

Continuous subcutaneous insulin infusion (CSII or insulin pump) therapy

3.7.10 Full guidance on the use of insulin pump therapy in adults with type 1 diabetes is beyond the scope of this document. Ireland does not currently have guidelines for insulin pump therapy in adults with diabetes, however it is hoped that this guideline will be developed within the coming years. **[updated 2024]**

Rapid-acting insulin

3.7.11 Offer rapid-acting insulin analogues injected before meals, rather than rapid-acting soluble human or animal insulins, for mealtime insulin replacement for adults with type 1 diabetes.

3.7.12 Do not advise routine use of rapid-acting insulin analogues after meals for adults with type 1 diabetes.

3.7.13 If an adult with type 1 diabetes has a strong preference for an alternative mealtime insulin, respect their wishes and offer the preferred insulin.

Mixed insulin

3.7.14 Consider a twice-daily human mixed insulin regimen for adults with type 1 diabetes if a multiple daily injection basal–bolus insulin regimen is not possible and a twice-daily mixed insulin regimen is chosen.

3.7.15 Consider a trial of a twice-daily analogue mixed insulin regimen if an adult using a twice-daily human mixed insulin regimen has hypoglycaemia that affects their quality of life.

Optimising insulin therapy

3.7.16 For adults with erratic and unpredictable blood glucose control (hyperglycaemia and hypoglycaemia at no consistent times), rather than a change in a previously optimised insulin regimen, the following should be considered:

- injection technique
- injection sites
- self-monitoring skills
- knowledge and self-management skills
- nature of lifestyle
- psychological and psychosocial difficulties
- possible organic causes such as gastroparesis.

3.7.17 Give clear guidelines and protocols ('sick-day rules') to all adults with type 1 diabetes to help them to adjust insulin doses appropriately during periods of illness.

Adjuncts

3.7.18 Consider adding metformin to insulin therapy if an adult with type 1 diabetes and a BMI of 25 kg/m2 (23 kg/m2 for people from South Asian and related ethnic minority groups) or above wants to improve their blood glucose control while minimising their effective insulin dose.

3.8 Insulin delivery

3.8.1 Adults with type 1 diabetes who inject insulin should have access to the insulin injection delivery device they find allows them optimal wellbeing, often using one or more types of insulin injection pen.

3.8.2 Provide adults with type 1 diabetes who have special visual or psychological needs with injection devices or needle-free systems that they can use independently for accurate dosing.

3.8.3 Offer needles of different lengths to adults with type 1 diabetes who are having problems such as pain, local skin reactions and injection site leakages.

3.8.4 After taking clinical factors into account (See FIT Ireland Recommendations www.fit4diabetes.com) choose needles with the lowest acquisition cost to use with pre-filled and reusable insulin pen injectors. **[updated 2024]**

3.8.5 Advise adults with type 1 diabetes to rotate insulin injection sites and avoid repeated injections at the same point within sites.

3.8.6 Provide adults with type 1 diabetes with suitable containers for collecting used needles and other sharps. Arrangements should be available for the suitable disposal of these containers.

3.8.7 Check injection site condition at least annually and if new problems with blood glucose control occur.

3.9 Referral for islet or pancreas transplantation

3.9.1 Consider referring adults with type 1 diabetes who have recurrent severe hypoglycaemia that has not responded to other treatments (see section 3.10) to a centre that assesses people for islet and/or pancreas transplantation.

3.9.2 Consider islet or pancreas transplantation for adults with type 1 diabetes with suboptimal diabetes control who have had a renal transplant and are currently on immunosuppressive therapy.

3.10 Awareness and management of hypoglycaemia

Identifying and quantifying impaired awareness of hypoglycaemia

3.10.1 Assess awareness of hypoglycaemia in adults with type 1 diabetes at each annual review.

3.10.2 Use the Gold score or Clarke score to quantify awareness of hypoglycaemia in adults with type 1 diabetes, checking that the questionnaire items have been answered correctly.

3.10.3 Explain to adults with type 1 diabetes that impaired awareness of the symptoms of plasma glucose levels below 3 mmol/litre is associated with a significantly increased risk of severe hypoglycaemia.

Strategies for managing impaired awareness of hypoglycaemia

3.10.4 Ensure that adults with type 1 diabetes with impaired awareness of hypoglycaemia have had structured education in flexible insulin therapy using basal–bolus regimens and are following its principles correctly.

3.10.5 Offer additional education focusing on avoiding and treating hypoglycaemia to adults with type 1 diabetes who continue to have impaired awareness of hypoglycaemia after structured education in flexible insulin therapy.

3.10.6 Avoid relaxing individualised blood glucose targets as a treatment for adults with type 1 diabetes with impaired awareness of hypoglycaemia.

3.10.7 If target blood glucose levels preferred by adults with type 1 diabetes who have impaired awareness of hypoglycaemia are lower than recommended, reinforce the recommended targets (see recommendations 3.6.22-3.6.25).

3.10.8 Review insulin regimens and doses and prioritise strategies to avoid hypoglycaemia in adults with type 1 diabetes with impaired awareness of hypoglycaemia, including:

- reinforcing the principles of structured education
- offering continuous subcutaneous insulin infusion (CSII or insulin pump) therapy
- offering real-time continuous glucose monitoring.

3.10.9 If impaired awareness of hypoglycaemia is associated with recurrent severe hypoglycaemia in an adult with type 1 diabetes despite these interventions, consider referring the person to a specialist centre.

Preventing and managing hypoglycaemia

3.10.10 Explain to adults with type 1 diabetes that a fast-acting form of glucose is needed for the management of hypoglycaemic symptoms or signs in people who are able to swallow.

3.10.11 Adults with type 1 diabetes with a decreased level of consciousness as a result of hypoglycaemia and so are unable to take oral treatment safely should be:

- given intramuscular glucagon by a family member or friend who has been shown how to use it (intravenous glucose may be used by healthcare professionals skilled in obtaining intravenous access)
- monitored for response at 10 minutes, and call an ambulance if their level of consciousness is not improving significantly
- then given oral carbohydrate when it is safe to administer it, and placed under continued observation by a third party who has been warned of the risk of relapse.

3.10.12 Explain to adults with type 1 diabetes that some hypoglycaemic episodes are an inevitable consequence of insulin therapy in most people using any insulin regimen, and that it is advisable that they should use a regimen that avoids or reduces the frequency of hypoglycaemic episodes while maintaining as optimal a level of blood glucose control as is feasible. Make advice available to all adults with type 1 diabetes to assist in obtaining the best such balance from any insulin regimen. (See sections 3.7 and 3.8).

3.10.13 If hypoglycaemia becomes unusually problematic or of increased frequency, review 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 if necessary
- injection site problems
- possible organic causes including gastroparesis
- changes in insulin sensitivity (including drugs affecting the renin–angiotensin system and renal failure)
- psychological problems

- previous physical activity
- lack of appropriate knowledge and skills for self-management.

3.10.14 Manage nocturnal hypoglycaemia (symptomatic or detected on monitoring) by:

- reviewing knowledge and self-management skills
- reviewing current insulin regimen, evening eating habits and previous physical activity
- choosing an insulin type and regimen that is less likely to induce low glucose levels at night.

3.10.15 If early cognitive decline occurs in adults on long-term insulin therapy, supplement normal investigations by the consideration or investigation of possible brain damage resulting from overt or covert hypoglycaemia, and the need to ameliorate this.

3.11 Ketone monitoring and management of diabetic ketoacidosis (DKA)

Ketone self-monitoring for prevention of DKA

3.11.1 Consider ketone monitoring (blood or urine) as part of 'sick-day rules' for adults with type 1 diabetes, to facilitate self-management of an episode of hyperglycaemia.

Ketone monitoring in hospital

3.11.2 In adults with type 1 diabetes presenting to emergency services, consider capillary blood ketone testing if:

- DKA is suspected or
- the person has uncontrolled diabetes with a period of illness, and urine ketone testing is positive.

3.11.3 Consider capillary blood ketone testing for inpatient management of DKA in adults with type 1 diabetes that is incorporated into a formal protocol.

Management of DKA

3.11.4 Professionals managing DKA in adults should be adequately trained, including regular updating, and be familiar with all aspects of its management which are associated with mortality and morbidity. These topics should include:

- fluid balance
- acidosis
- cerebral oedema
- electrolyte imbalance
- disturbed interpretation of familiar diagnostic tests (white cell count, body temperature, ECG)
- respiratory distress syndrome
- cardiac abnormalities
- precipitating causes
- infection management, including opportunistic infections
- gastroparesis

- use of high dependency and intensive care units
- recommendations 3.11.5 to 3.11.12 in this guideline.

Management of DKA in adults should be in line with local clinical governance.

3.11.5 For primary fluid replacement in adults with DKA, use isotonic saline, not given too rapidly except in cases of circulatory collapse.

3.11.6 Do not generally use bicarbonate in the management of DKA in adults.

3.11.7 Give intravenous insulin by infusion to adults with DKA.

3.11.8 In the management of DKA in adults, once the plasma glucose concentration has fallen to 10–15 mmol/litre, give glucose-containing fluids (not more than 2 litres in 24 hours) in order to allow continued infusion of insulin at a sufficient rate to clear ketones (for example, 6 units/hour monitored for effect).

3.11.9 Begin potassium replacement early in DKA in adults, with frequent monitoring for the development of hypokalaemia.

3.11.10 Do not generally use phosphate replacement in the management of DKA in adults.

3.11.11 In adults with DKA who have reduced consciousness, think about:

- inserting a nasogastric tube and
- monitoring urine output using a urinary catheter and
- giving venous thromboembolism (VTE) prophylaxis. **[updated 2024]**

3.11.12 To reduce the risk of catastrophic outcomes in adults with DKA, ensure that monitoring is continuous and that review covers all aspects of clinical management at frequent intervals.

3.12 Associated illness

3.12.1 In adults with type 1 diabetes who have unexplained weight loss, assess for coeliac disease. For guidance on testing for coeliac disease, see NICE's guideline on coeliac disease. **[updated 2024]**

3.12.2 Be alert to the possibility of the development of other autoimmune disease in adults with type 1 diabetes (including Addison's disease and pernicious anaemia). For advice on monitoring for thyroid disease, see recommendation 13.16.45.

3.13 Control of cardiovascular risk

Aspirin

3.13.1 Do not offer aspirin for the primary prevention of cardiovascular disease to adults with type 1 diabetes.

Identifying cardiovascular risk

3.13.2 Assess cardiovascular risk factors annually, including:

- estimated glomerular filtration rate (eGFR) and urine albumin:creatinine ratio (ACR)
- smoking
- blood glucose control
- blood pressure

- full lipid profile (including high-density lipoprotein [HDL] and low-density lipoprotein [LDL] cholesterol, and triglycerides)
- age
- family history of cardiovascular disease
- abdominal adiposity. **[updated 2024]**

3.13.3 For guidance on tools for assessing risk of cardiovascular disease in adults with type 1 diabetes, refer to local standards and guidelines of care and NICE guideline [NG238] Cardiovascular disease: risk assessment and reduction, including lipid modification. **[updated 2024]**

Interventions to reduce risk and manage cardiovascular disease

3.13.4 For guidance on the primary prevention of cardiovascular disease in adults with type 1 diabetes refer to NICE guideline [NG238] Cardiovascular disease: risk assessment and reduction, including lipid modification. **[updated 2024]**

3.13.5 Give adults with type 1 diabetes who smoke advice on smoking cessation and use of smoking cessation services. Reinforce these messages annually for people who currently do not plan to stop smoking, and at all clinical contacts if there is a prospect of the person stopping.

3.13.6 Advise young adult non-smokers never to start smoking.

3.13.7 Provide intensive management for adults who have had myocardial infarction or stroke, according to relevant non-diabetes guidelines. In the presence of angina or other ischaemic heart disease, beta-adrenergic blockers should be considered. (For use of insulin in these circumstances, see section 3.14). For guidance on secondary prevention of myocardial infarction, see NICE guideline [NG185] Acute Coronary Syndrome. **[updated 2024]**

Blood pressure management

3.13.8 In adults with type 1 diabetes aim for blood pressure targets as follows:

- For adults with a urine albumin:creatinine ratio (ACR) less than 70 mg/mmol, aim for a clinic systolic blood pressure less than 140 mmHg (target range 120 to 139 mmHg) and a clinic diastolic blood pressure less than 90 mmHg.
- For adults with an ACR of 70 mg/mmol or more, aim for a clinic systolic blood pressure less than 130 mmHg (target range 120 to 129 mmHg) and a clinic diastolic blood pressure less than 80 mmHg.
- In adults aged 80 or more, whatever the ACR, aim for a clinic systolic blood pressure less than 150 mmHg and a clinic diastolic blood pressure less than 90 mmHg. Use clinical judgement for adults with frailty, target organ damage (damage to organs because of diabetes, for example, to nerves or eyes) or multimorbidity. See the recommendations on pharmacotherapy in NICE's guideline on chronic kidney disease, and NICE's guidelines on hypertension in adults and multimorbidity. See also recommendations 3.16.14–3.16.16. **[updated 2024]**

3.13.9 To allow informed choice by the person with hypertension, discuss the following with them:

- reasons for choice of intervention level
- substantial potential gains from small improvements in blood pressure control
- possible negative consequences of therapy.

See also recommendations 3.16.14 and 3.16.15.

3.13.10 Start a trial of a renin–angiotensin system blocking drug as first-line therapy for hypertension in adults with type 1 diabetes.

3.13.11 Provide information to adults with type 1 diabetes on the potential for lifestyle changes to improve blood pressure control and associated outcomes, and offer assistance in achieving their aims in this area.

3.13.12 Do not allow concerns over potential side effects to inhibit advising and offering the necessary use of any class of drugs, unless the side effects become symptomatic or otherwise clinically significant. In particular:

- do not avoid selective beta-adrenergic blockers where indicated in adults on insulin
- low-dose thiazides may be combined with beta-blockers
- when calcium channel antagonists are prescribed, use only long-acting preparations
- use direct questioning to detect the potential side effects of erectile dysfunction, lethargy and orthostatic hypotension with different drug classes.

3.14 Care of adults with type 1 diabetes in hospital

Blood glucose control

3.14.1 Aim for a target plasma glucose level of 5–8 mmol/litre for adults with type 1 diabetes during surgery or acute illness.

3.14.2 Establish a local protocol for controlling blood glucose levels in adults with type 1 diabetes during surgery or acute illness to achieve the target level.

3.14.3 Use intravenous in preference to subcutaneous insulin regimens for adults with type 1 diabetes if:

- the person is unable to eat or is predicted to miss more than 1 meal or
- an acute situation is expected to result in unpredictable blood glucose levels – for example, major surgery, high-dose steroid treatment, inotrope treatment or sepsis or
- insulin absorption is expected to be unpredictable, for example because of circulatory compromise.

3.14.4 Consider continuing the person's existing basal insulin regimen (including basal rate if they are using continuous subcutaneous insulin infusion [CSII or insulin pump] therapy) together with protocol-driven insulin delivery for controlling blood glucose levels in adults with type 1 diabetes during surgery or acute illness.

3.14.5 Use subcutaneous insulin regimens (including rapid-acting insulin before meals) if an adult with type 1 diabetes and acute illness is eating.

3.14.6 Enable adults with type 1 diabetes who are hospital inpatients to self-administer subcutaneous insulin if they are willing and able and it is safe to do so.

Delivery of care

3.14.7 From the time of admission, the adult with type 1 diabetes and the team caring for him or her should receive, on a continuing basis, advice from and access to a trained multidisciplinary team with expertise in diabetes.

3.14.8 Throughout the course of an inpatient admission, respect the personal expertise of adults with type 1 diabetes (in managing their own diabetes) and if their condition allows, routinely integrate this into ward-based blood glucose monitoring and insulin delivery.

3.14.9 Throughout the course of an inpatient admission, the hospital catering service should provide a good choice of nutritious meals that can accommodate patients' specific dietary requirements. All patients should have a choice of food, including those on a texture-modified diet, therapeutic diet, ethical or cultural diets. This includes patients in emergency departments who are deemed to be admitted to the hospital, but who remain in the emergency department while waiting for a hospital inpatient bed to become available[2].

3.14.10 Members of care teams caring for adults with type 1 diabetes in institutions, such as nursing homes, residential homes and prisons, should follow the recommendations in this section.

3.14.11 Provide optimal insulin therapy, which can be achieved by the use of intravenous insulin and glucose, to all adults with type 1 diabetes with threatened or actual stroke. Critical care and emergency departments should have a protocol for such management.

3.15 Pre-pregnancy Care

Women of reproductive age should be informed of the importance of optimising management of their diabetes prior to pregnancy and should have access to pre-pregnancy care. See the HSE (2010) Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus, HSE/RCPI Diabetes in Pregnancy: A Model of Care for Ireland (2024), and NICE Guideline NG3:Diabetes in pregnancy: management from preconception to the postnatal period. **[updated 2024]**

3.16 Managing complications

Periodontitis [new 2024]

3.16.1 Advise adults with type 1 diabetes at their annual review of self-care and needs that:

- They are at higher risk of periodontitis
- If they get periodontitis, managing it can improve their blood glucose control and can reduce their risk of hyperglycaemia.

3.16.2 Advise adults with type 1 diabetes to have regular oral health reviews (their oral healthcare team will tell them how often, in line with the NICE guideline on dental checks: intervals between oral health reviews).

3.16.3 For guidance for oral healthcare and dental teams on how to provide oral health advice, see the NICE guideline on oral health promotion.

3.16.4 For adults with type 1 diabetes who have been diagnosed with periodontitis by an oral healthcare or dental team, offer dental appointments to manage and treat their periodontitis (at a frequency based on their oral health needs).

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[2] HIQA (2016). Report on Nutrition and Hydration in Acute Public Hospitals Health Information and Quality Authority. Available from https://www.hiqa.ie/hiqa-news-updates/new-hiqa-report-nutrition-and-hydration-public-acute-hospitals

Eye disease

3.16.5 Start eye screening for adults newly diagnosed with type 1 diabetes from diagnosis.

3.16.6 All patients with type 1 diabetes should be registered with the National Retinopathy Screening Programme

3.16.7 Explain the reasons and success of eye screening systems to adults with type 1 diabetes, so that attendance is not reduced by lack of knowledge or fear of outcome.

3.16.8 Depending on the findings, follow structured eye screening by:

- routine review annually by digital photographic screening via RetinaScreen or by clinical exam **or**
- earlier review **or**
- referral to an ophthalmologist if indicated.

3.16.9 Offer digital retinopathy screening annually to adults with type 1 diabetes.

3.16.10 Use mydriasis with tropicamide when photographing the retina, after prior agreement with the adult with type 1 diabetes after discussion of the advantages and disadvantages, including appropriate precautions for driving.

3.16.11 Make visual acuity testing a routine part of eye screening programmes.

3.16.12 Ensure that emergency review by an ophthalmologist occurs for:

- sudden loss of vision
- rubeosis iridis
- pre-retinal or vitreous haemorrhage
- retinal detachment.

3.16.13 Ensure that rapid review by an ophthalmologist occurs for new vessel formation.

3.16.14 Refer to an ophthalmologist/Diabetic Retinal Treatment Clinic for:

- referable maculopathy:
  - exudate or retinal thickening within 1 disc diameter of the centre of the fovea
  - circinate or group of exudates within the macula (the macula is defined here as a circle centred on the fovea, of a diameter the distance between the temporal border of the optic disc and the fovea)
  - any microaneurysm or haemorrhage within 1 disc diameter of the centre of the fovea, only if associated with a best visual acuity of 6/12 or worse
- referable pre-proliferative retinopathy for any of the following:
  - multiple deep, round or blot haemorrhages
  - venous beading
  - venous reduplication
  - intraretinal microvascular abnormalities (IRMA)
    (Cotton wool spots are not diagnostic of pre-proliferative retinopathy but should promote a careful search for other lesions)
- any large sudden unexplained drop in visual acuity.

Diabetic kidney disease

3.16.15 For guidance on managing kidney disease in adults with type 1 diabetes, refer to local standards and guidelines of care

3.16.16 Ask all adults with type 1 diabetes, with or without detected nephropathy, to bring in the first urine sample of the day ('early morning urine') once a year. Send this for estimation of albumin:creatinine ratio (estimating urine albumin concentration alone is a poor alternative) and measure eGFR at the same time. See NICE's guideline on chronic kidney disease. **[updated 2024]**

3.16.17 Suspect other renal disease:

- in the absence of progressive retinopathy
- if blood pressure is particularly high
- if proteinuria develops suddenly
- if significant haematuria is present
- in the presence of systemic ill health.

3.16.18 Discuss the significance of a finding of albuminuria with the person concerned.

3.16.19 Start angiotensin-converting enzyme (ACE) inhibitors and, with the usual precautions, titrate to full dose in all adults with confirmed nephropathy (including those with moderately increased albuminuria ['microalbuminuria'] alone) and type 1 diabetes.

3.16.20 If ACE inhibitors are not tolerated, substitute angiotensin 2 receptor antagonists. Combination therapy is not recommended.

3.16.21 Maintain blood pressure below 130/80 mmHg by addition of other anti-hypertensive drugs if necessary.

3.16.22 Advise adults with type 1 diabetes and nephropathy about the advantages of not following a high-protein diet.

3.16.23 Referral criteria for tertiary care should be agreed between local diabetes specialists and nephrologists.

Chronic painful diabetic neuropathy

3.16.24 For guidance on managing chronic painful diabetic neuropathy in adults with type 1 diabetes, refer to HSE (2018) Integrated Care Model for Type 2 diabetes and the ICGP (2016) Practical Guide to Integrated Type 2 Diabetes Care.

Autonomic neuropathy

3.16.25 In adults with type 1 diabetes who have unexplained diarrhoea, particularly at night, the possibility of autonomic neuropathy affecting the gut should be considered.

3.16.26 Take care when prescribing antihypertensive medicines not to expose people to the risks of orthostatic hypotension as a result of the combined effects of sympathetic autonomic neuropathy and blood pressure lowering medicines.

3.16.27 In adults with type 1 diabetes who have bladder emptying problems, investigate the possibility of autonomic neuropathy affecting the bladder, unless other explanations are adequate.

3.16.28 When managing the symptoms of autonomic neuropathy, include standard interventions for the manifestations encountered (for example, for abnormal sweating and postural hypotension).

3.16.29 Anaesthetists should be aware of the possibility of parasympathetic autonomic neuropathy affecting the heart in adults with type 1 diabetes who are listed for procedures under general anaesthetic and who have evidence of somatic neuropathy or other manifestations of autonomic neuropathy.

Gastroparesis

3.16.30 Advise a small-particle-size diet (mashed or pureed food) for symptomatic relief for adults with type 1 diabetes who have vomiting caused by gastroparesis[3].

3.16.31 Consider continuous subcutaneous insulin infusion (CSII or insulin pump) therapy for adults with type 1 diabetes who have gastroparesis.

3.16.32 For adults with type 1 diabetes who have vomiting caused by gastroparesis, explain that:

- there is no strong evidence that any available antiemetic therapy is effective
- some people have had benefit with domperidone[4], erythromycin[5] or metoclopramide[6].
- The strongest evidence for effectiveness is for domperidone[4], but prescribers must take into account its safety profile, in particular its cardiac risk and potential interactions with other medicines.

3.16.33 For treating vomiting caused by gastroparesis in adults with type 1 diabetes:

- consider alternating use of erythromycin[5] and metoclopramide[6]
- consider domperidone[4] only in exceptional circumstances (that is, when it is the only effective treatment) and in accordance with European Medicine Agency and Health Products Regulatory Authority guidance. **[updated 2024]**

3.16.34 Refer adults with type 1 diabetes who have gastroparesis for specialist advice if the interventions in recommendations 3.16.26, 3.16.27 and 3.16.29 are not beneficial or not appropriate.

Acute painful neuropathy of rapid improvement of blood glucose control

3.16.35 Reassure adults with type 1 diabetes that acute painful neuropathy resulting from rapid improvement of blood glucose control is a self-limiting condition that improves symptomatically over time.

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[3] Diagnosis of gastroparesis needing specific therapy can only be made in the absence of hyperglycaemia at the time of testing, because hyperglycaemia induces a physiological delay in gastric emptying.

[4] European Medicines Agency and the Health Products Regulatory Authority (HPRA) (2014) notes that domperidone is associated with a small increased risk of serious cardiac side effects. Domperidone is now contraindicated in certain groups in whom the risk of cardiac effects is higher; its marketing authorisations have also been restricted to its use in the relief of nausea and vomiting only, at the lowest effective dose and for the shortest possible time (usually not more than 1 week). They advise that prescribers should take into account the overall safety profile of domperidone, and in particular its cardiac risk and potential interactions with other medicines (such as erythromycin), if there is a clinical need to use it at doses or durations greater than those authorised. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented.
Refer to HPRA https://www.hpra.ie/homepage/site-tools/search?query=domperidone

[5] Refer to HPRA https://www.hpra.ie/homepage/site-tools/search?query=erythromycin

[6] HPRA(2014) notes that metoclopramide has well-known risks of neurological effects such as short-term extrapyramidal disorders and tardive dyskinesia. It advises that metoclopramide should be prescribed only for short-term use (up to 5 days) at a maximum dose of 0.5mg per kg body weight in 24 hours. Refer to HPRA https://www.hpra.ie/homepage/site-tools/search?query=metoclopramide

3.16.36 Explain to adults with type 1 diabetes that the specific treatments for acute painful neuropathy resulting from rapid improvement of blood glucose control:

- have the aim of making the symptoms tolerable until the condition resolves
- may not relieve pain immediately and may need to be taken regularly for several weeks to be effective.

3.16.37 Use of simple analgesics (paracetamol, aspirin) and local measures (bed cradles) are recommended as a first step, but if trials of these measures are ineffective, discontinue them and try other measures.

3.16.38 Do not relax diabetes control to address acute painful neuropathy resulting from rapid improvement of blood glucose control in adults with type 1 diabetes.

3.16.39 If simple analgesia does not provide sufficient pain relief for adults with type 1 diabetes who have acute painful neuropathy resulting from rapid improvement of blood glucose control, offer treatment as described in the HSE Integrated Model of Care for Type 2 diabetes (2018). Simple analgesia may be continued until the effects of additional treatments have been established.

3.16.40 When offering medicines for managing acute painful neuropathy resulting from rapid improvement of blood glucose control to adults with type 1 diabetes, be aware of the risk of dependency associated with opioids.

Diabetic foot problems

13.6.41 For guidance on preventing and managing foot problems in adults with type 1 diabetes, see the HSE (2021) Model of Care for the Diabetic foot and HSE (2018) National Best Practice and Evidence based guidelines for Wound Management. **[updated 2024]**

Erectile dysfunction

13.6.42 Offer men with type 1 diabetes the opportunity to discuss erectile dysfunction as part of their regular review.

13.6.43 Offer a phosphodiesterase-5 inhibitor to men with type 1 diabetes with isolated erectile dysfunction unless contraindicated. Choose the phosphodiesterase-5 inhibitor with the lowest acquisition cost.

13.6.44 Consider referring men with type 1 diabetes to a service offering further assessment and other medical, surgical or psychological management of erectile dysfunction if phosphodiesterase-5 inhibitor treatment is unsuccessful or contraindicated.

Thyroid disease monitoring

13.6.45 Measure blood thyroid-stimulating hormone (TSH) levels in adults with type 1 diabetes at annual review.

Psychological and Mental Health problems

13.6.46 Members of diabetes professional teams providing care or advice to adults with type 1 diabetes should be alert to the development or presence of clinical or subclinical depression and/or anxiety, in particular if someone reports or appears to be having difficulties with self-management.

13.6.47 Diabetes professionals should:

- ensure that they have appropriate skills in the detection and basic management of non-severe psychological disorders in people from different cultural backgrounds
- be familiar with appropriate counselling techniques and drug therapy, while arranging prompt referral to specialists of those people in whom psychological difficulties continue to interfere significantly with wellbeing or diabetes self-management.
- Diabetes healthcare professionals should collaborate with Mental Health Services (including Clinical Psychology as part of a Liaison Mental Health Team and/or Community Mental Health Services) to establish pathways to ensure that when required, patients with type 1 diabetes have rapid access to Mental Health Services

Eating disorders

13.6.48 Members of diabetes professional teams should be alert to the possibility of bulimia nervosa, anorexia nervosa and insulin dose manipulation in adults with type 1 diabetes with:

- over-concern with body shape and weight
- low BMI
- hypoglycaemia
- suboptimal overall blood glucose control.

See HSE Model of Care for Eating Disorders, available at http://www.hse.ie/eng/about/Who/cspd/ncps/mental-health/eating-disorders/

13.6.49 The risk of morbidity from the complications of poor metabolic control suggests that consideration should be given to early, and occasionally urgent, referral of adults with type 1 diabetes to local eating disorder services.

13.6.50 Make provision for high-quality professional team support at regular intervals with regard to counselling about lifestyle issues and particularly dietary behaviour for all adults with type 1 diabetes from the time of diagnosis (see sections 3.3 and 3.4).

4 Appendices

Appendix 1: Terms of Reference for Guideline Development Group

Membership of the Guideline Development Group is outlined at the beginning of this document.

Terms of reference 2024

To update the NCEC national clinical guideline no. 17 for the diagnosis and management of adults with type 1 diabetes. To do this by contextualising the 2021 and 2022 updates to the NICE Type 1 diabetes in adults guideline.

Terms of reference 2018

To develop a national evidence-based clinical guideline for the diagnosis and management of adults with type 1 diabetes. To do this by contextualising the NICE Type 1 diabetes in adults guideline, developing a budget impact analysis in conjunction with HRB-CICER and finally completion of a guideline implementation plan.

Appendix 2A: Recommendations from NICE NG17 2022 that have been contextualised – 2024 Rapid Update

Recommendations listed in the table below are those which changes were made to the NICE clinical guideline to ensure they are appropriate for the Republic of Ireland with the rationale for these changes outlined.

Table 5: Recommendations from NICE NG17 2022 that have been contextualised during the 2024 Rapid Update

	Original wording from NICE NG17 (2022)	**Recommendation following contextualisation for this guideline**	**Rationale for Contextualisation**
1	1.6.18. Commissioners, providers and healthcare professionals should address inequalities in CGM access and uptake by: • monitoring who is using CGM • identifying groups who are eligible but who have a lower uptake • making plans to engage with these groups to encourage them to consider CGM. [2022]	3.6.18. Healthcare management and clinicians should address inequalities in CGM access and uptake by: • monitoring who is using CGM • identifying groups who are eligible but who have a lower uptake • making plans to engage with these groups to encourage them to consider CGM.	**Contextualisation** - The term 'commissioners' is not used in the Irish healthcare system.
2	For a short explanation of why the committee made these recommendations and how they might affect practice, see the rationale and impact section on continuous glucose monitoring. Full details of the evidence and the committee's discussion are in evidence review B: continuous glucose monitoring in adults with type 1 diabetes.	The Health Information and Quality Authority (HIQA) has published a rapid health technology assessment (HTA) on the use of continuous glucose monitoring (CGM) systems in adults with type 1 diabetes (2023) which has informed the updates in this section. The HTA recommended the establishment of a single managed access programme for all CGM systems for all individuals with T1DM regardless of age. The HSE has established a Managed Access Programme for CGM.	**Contextualisation** The link to the HTA which has informed the updates in this section for the Irish healthcare system has been inlcuded.

	Original wording from NICE NG17 (2022)	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
3	1.6.20. Support adults with type 1 diabetes who are using capillary blood glucose monitoring to measure at least 4 times a day, and up to 10 times a day: if their target for blood glucose control, measured by HbA1c level (see recommendation 1.6.6), is not reached • if they are having more frequent hypoglycaemic episodes • if there is a legal requirement to do so, such as before driving (see the Driver and Vehicle Licensing Agency [DVLA] guide for medical professionals) • during periods of illness • before, during and after sport • when planning pregnancy, during pregnancy and while breastfeeding (see NICE's guideline on diabetes in pregnancy) • if they need to know their blood glucose levels more than 4 times a day for other reasons (for example, impaired hypoglycaemia awareness, or they are undertaking high-risk activities). [2015, amended 2022]	3.6.20. Support adults with type 1 diabetes who are using capillary blood glucose monitoring to measure at least 4 times a day, and up to 10 times a day: if their target for blood glucose control, measured by HbA1c level (see recommendation 3.6.6), is not reached • if they are having more frequent hypoglycaemic episodes • if there is a legal requirement to do so, such as before driving (see the National Office for Traffic Medicine (NOTM) Medical Fitness to Drive Guidelines (2022)) • during periods of illness • before, during and after sport • when planning pregnancy, during pregnancy and while breastfeeding (see NICE's guideline on diabetes in pregnancy) • if they need to know their blood glucose levels more than 4 times a day for other reasons (for example, impaired hypoglycaemia awareness, or they are undertaking high-risk activities).	**Contextualisation** The Irish GDG have reviewed and accept wording from NICE 2022 with exception of change the DVLA to National Office for Traffic Management driving guidelines.

	Original wording from NICE NG17 (2022)	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
4	1.7.4. Consider 1 of the following as an alternative basal insulin therapy to twice-daily insulin detemir for adults with type 1 diabetes: • an insulin regimen that is already being used by the person if it is meeting their agreed treatment goals (such as meeting their HbA1c targets or time in target glucose range and minimising hypoglycaemia) • once-daily insulin glargine (100 units/ml) if insulin detemir is not tolerated or the person has a strong preference for once-daily basal injections • once-daily insulin degludec (100 units/ml) if there is a particular concern about nocturnal hypoglycaemia • once-daily ultra-long-acting insulin such as degludec (100 units/ml) for people who need help from a carer or healthcare professional to administer injections. There is a risk of severe harm and death due to inappropriately withdrawing insulin from pen devices. See NHS England's patient safety alert for further information. [2021]	3.7.4. Consider 1 of the following as an alternative basal insulin therapy to twice-daily insulin detemir for adults with type 1 diabetes: • an insulin regimen that is already being used by the person if it is meeting their agreed treatment goals (such as meeting their HbA1c targets or time in target glucose range and minimising hypoglycaemia) • once-daily insulin glargine (100 units/ml) if insulin detemir is not tolerated or the person has a strong preference for once-daily basal injections • once-daily insulin degludec (100 units/ml) if there is a particular concern about nocturnal hypoglycaemia • once-daily ultra-long-acting insulin such as degludec (100 units/ml) for people who need help from a carer or healthcare professional to administer injections. There is a risk of severe harm and death due to inappropriately withdrawing insulin from pen devices. See HPRA communications for further information.	**Contextualisation** The Irish GDG have reviewed and accept NICE 2022 wording except for the last sentence…*"See NHS England…. information)"*. Reference to communications from the HPRA have been included, to reflect guidance in the Irish healthcare system.

	Original wording from NICE NG17 (2022)	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
5	1.7.6. Ensure the risk of medication errors with insulins is minimised by following Medicines and Healthcare products Regulatory Agency (MHRA) guidance on minimising the risk of medication error with high strength, fixed combination and biosimilar insulin products, which includes advice for healthcare professionals when starting treatment with a biosimilar. [2021]	3.7.6. Ensure the risk of medication errors with insulins is minimised by following Health Products Regulatory Authority (HPRA) guidance and European Medicines Agency (EMA) guidance on minimising the risk of medication error with high strength and fixed combination insulin products.	Contextualisation The Irish GDG have reviewed and accept NICE 2021 wording, with the exception of: MHRA guidelines substituted with HPRA and EMA guidelines, and the description of what is contained in these guidelines is modified, to reflect guidance in the Irish healthcare system.

Note: Additional recommendations to those in table 4 were also added or updated in the 2024 Rapid Update of the guideline, however these were in line with the NICE 2021 and 2021 updates, and did not require contextualisation to the Irish health service. These can be recognised by the text '**[new 2024]**' or '**[updated 2024]**'.

Appendix 2B: Recommendations from NICE NG17 2015 that have been contextualised – 2018 guideline

Recommendations listed in the table below are those which changes were made to the NICE clinical guideline to ensure they are appropriate for the Republic of Ireland with the rationale for these changes outlined.

Note: Some of these recommendations may have been subsequently updated in the 2024 review.

*Recommendations that have been contextualised following feedback received from the external consultation process

Table 6: Recommendations from NICE NG17 (2015) that have been contextualised

	Original wording from NICE NG17	**Recommendation following contextualisation for this guideline**	**Rationale for Contextualisation**
1	Recommendation 1.1.1 - Diagnose type 1 diabetes on clinical grounds in adults presenting with hyperglycaemia, bearing in mind that people with type 1 diabetes typically (but not always) have one or more of: • ketosis • rapid weight loss • age of onset below 50 years • BMI below 25 kg/m2 • personal and/or family history of autoimmune disease.	Recommendation 3.1.1 - Diagnose type 1 diabetes on clinical grounds in adults presenting with hyperglycaemia, bearing in mind that people with type 1 diabetes typically (but not always) have one or more of: • ketosis • rapid weight loss • age of onset below 50 years • BMI below 25 kg/m2 • personal and/or family history of autoimmune disease.	Emphasis the “but not always” based on external consultation feedback*

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
2	Recommendation 1.1.7 - Elements of an individualised and culturally appropriate plan will include: • sites and timescales of diabetes education, including nutritional advice (see sections 1.3 and 1.4) • initial treatment modalities, including guidance on insulin injection and insulin regimens (see sections 1.7 and 1.8) •means of self-monitoring and targets (see section 1.6) • symptoms, risk and treatment of hypoglycaemia • management of special situations, such as driving • means and frequency of communication with the diabetes professional team • management of cardiovascular risk factors (see section 1.13) • for women of childbearing potential, implications for pregnancy and family planning advice (see the NICE guideline on diabetes in pregnancy) • frequency and content of follow-up consultations, including review of HbA1c levels and experience of hypoglycaemia, and annual review.	Recommendation 3.1.7 - Elements of an individualised and culturally appropriate plan will include: • sites and timescales of diabetes education, including nutritional advice (see sections 1.3 and 1.4) • initial treatment modalities, including guidance on insulin injection and insulin regimens (see sections 1.7 and 1.8) • means of self-monitoring and targets (see section 1.6) • symptoms, risk and treatment of hypoglycaemia • management of special situations, such as driving • means and frequency of communication with the diabetes professional team • management of cardiovascular risk factors (see section 1.13 • for women of childbearing potential, implications for pregnancy and family planning advice (see the HSE Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus from Pre-conception to the Postnatal period and NICE guidelines on diabetes in pregnancy) • frequency and content of follow-up consultations, including review of HbA1c levels and experience of hypoglycaemia, and annual review.	Reference to Irish guidelines.

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
3	Not applicable	Recommendation 3.1.9 - All patients who are newly diagnosed with diabetes should be registered with the Long Term Illness(LTI) scheme and the National Diabetes Retinopathy Screening Programme	Addition of this recommendation as all people with diabetes in Ireland are eligible for a LTI card. Patients also should be register on diagnosis for annual retinal screening.
4	Recommendation 1.2.3 - Provide adults with type 1 diabetes with: open-access services on a walk-in and telephone-request basis during working hours a helpline staffed by people with specific diabetes expertise on a 24-hour basis contact information for these services. [2004]	Recommendation 3.2.3 - Provide adults with type 1 diabetes with: • open-access services on a walk-in and telephone-request basis during normal working hours of Diabetes Day Centre • contact information for these services	Agreement of GDG to clarify working hours of Diabetes Day Centre. Agreement to remove 24 hour basis contact information as there is no such service available in Ireland and no plan to establish

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
5	Recommendation 1.2.5 - Set up an individual care plan jointly agreed with the adult with type 1 diabetes, review it annually and modify it taking into account changes in the person's wishes, circumstances and medical findings, and record the details. The plan should include aspects of: • diabetes education, including nutritional advice (see sections 1.3 and 1.4) • insulin therapy, including dose adjustment (see sections 1.8 and 1.9) • self-monitoring (see section 1.6) • avoiding hypoglycaemia and maintaining awareness of hypoglycaemia • for women of childbearing potential, family planning, contraception and pregnancy planning (see the NICE guideline on diabetes in pregnancy) •cardiovascular risk factor monitoring and management (see section 1.13) • complications monitoring and management (see section 1.15) • means and frequency of communicating with the diabetes professional team • frequency and content of follow-up consultations, including review of HbA1c levels and experience of hypoglycaemia, and next annual review.	Recommendation 3.2.5 - Set up an individual care plan jointly agreed with the adult with type 1 diabetes, review it annually and modify it taking into account changes in the person's wishes, circumstances and medical findings, and record the details. The plan should include aspects of: • diabetes education, including nutritional advice (see sections 1.3 and 1.4) • insulin therapy, including dose adjustment (see sections 1.8 and 1.9) • self-monitoring (see section 1.6) • avoiding hypoglycaemia and maintaining awareness of hypoglycaemia • management of hypoglycaemia including training of friends and / or family on glucagon administration • sick day rules, ketone monitoring • for women of childbearing potential, family planning, contraception and pregnancy planning (see the HSE Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus from Pre-conception to the Postnatal period and NICE diabetes in pregnancy guidelines)	GDG wanted to strengthen recommendation on education of a family member on administration of glucagon and taking into account physiological wellbeing when setting up an individualised care plan. Ketone monitoring and sick day rules added following external consultation feedback.* Reference to Irish guidelines.

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
		• cardiovascular risk factor monitoring and management (see section 1.13) • complications monitoring and management (see section 1.15) • psychological wellbeing of the person with diabetes • means and frequency of communicating with the diabetes professional team • frequency and content of follow-up consultations, including review of HbA1c levels and experience of hypoglycaemia, and next annual review.	
6	Recommendation 1.2.8 - At the time of diagnosis and periodically thereafter, provide adults with type 1 diabetes with up-to-date information about diabetes support groups (local and national), how to contact them and the benefits of membership	Recommendation 3.2.8 - At the time of diagnosis and periodically thereafter, provide adults with type 1 diabetes with up-to-date information about diabetes support groups (local and national) e.g. Diabetes Ireland, how to contact them and the benefits of membership.	GDG agreed should be reference to main Irish advocacy group i.e. Diabetes Ireland
7	Recommendation 1.3.7 - Consider the Blood Glucose Awareness Training (BGAT) programme for adults with type 1 diabetes who are having recurrent episodes of hypoglycaemia.	Removed based on feedback received at consensus conference and following discussion at GDG meeting	This recommendation removed from guidelines, GDG agreed this training is not available in Ireland and there is no plan to establish BGAT training in Ireland

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
8	Not applicable	Recommendation 3.3.8 - Provide women of childbearing potential with information on the risks associated with pregnancy and the importance of adequate contraception & pre-conception planning see Diabetes in pregnancy (2015) NICE guideline (NG3).	Addition made to emphasis importance of education on pre-pregnancy care based on external consultation feedback*
9	Recommendation 1.4.3 - Do not advise adults with type 1 diabetes to follow a low glycaemic index diet for blood glucose control.	Removed based on feedback received at consensus conference and following discussion at GDG meeting	This recommendation was removed as the GDG did not want GI diets to be singled out for recommendation. This area only forms very small part of dietary management in Ireland. Agreement very limited evidence for low GI diets in glycaemia management in Type 1 but lower GI, higher fibre CHO foods may have other health benefits, low GI / high fat meals have the potential to cause delayed postprandial hyperglycaemia. Also the principles of GI are an important part of dietary education for type 1 as in DAFNE and other programmes. Agreement that rather than amend would remove recommendation.

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
10	Recommendation 1.4.6 - Provide nutritional information individually and as part of a diabetes education programme (see section 1.3). Include advice from professionals with specific and approved training and continuing accredited education in delivering nutritional advice to people with health conditions. Offer opportunities to receive nutritional advice at intervals agreed between adults with type 1 diabetes and their advising professionals. [2004]	Recommendation 3.4.5 - Provide nutritional information individually and as part of a diabetes education programme (see section 1.3). Include advice from a CORU registered dietitian with specific and approved training and continuing accredited education in delivering nutritional advice to people with health conditions. Offer opportunities to receive nutritional advice at intervals agreed between adults with type 1 diabetes and their advising healthcare professionals.	All dietitians working in the Irish health service executive in Ireland must be CORU registered based on external consultation feedback*
11	Recommendation 1.4.7 - Discuss the hyperglycaemic effects of different foods an adult with type 1 diabetes wishes to eat in the context of the insulin preparations chosen to match those food choices	Recommendation 3.4.6 - Discuss the glycaemic effects of different foods an adult with type 1 diabetes wishes to eat in the context of the insulin preparations chosen to match those food choices.	Agreement to change to glycaemic effects to cover hypo and hyper effects of different foods , both of which would be covered in education
12	Recommendation 1.4.9 - Agree the choice of content, timing and amount of snacks between meals or at bedtime available to the adult with type 1 diabetes, based on informed discussion about the extent and duration of the effects of eating different food types and the insulin preparations available to match them. Modify those choices based on discussion of the results of self-monitoring tests.	Recommendation 3.4.8 - Agree the indication for, choice of content, timing and amount of snacks between meals or at bedtime available to the adult with type 1 diabetes, based on informed discussion about the extent and duration of the effects of eating different food types and the insulin preparations available to match them. Modify those choices based on discussion of the results of self-monitoring tests.	Agreement to add the indication for snacking as snacking may not be recommended for all people with type 1 diabetes

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
13	Recommendation 1.4.10 - Make information available on: • effects of different alcohol-containing drinks on blood glucose excursions and calorie intake • use of high-calorie and high-sugar 'treats'	Recommendation 3.4.9 - Make information available on: • effects of different alcohol-containing drinks on blood glucose excursions and calorie intake • use of high-calorie and high-sugar foods.	Avoid use of word "treats" in all Irish healthy eating literature
14	Recommendation 1.4.12 - Modify nutritional recommendations to adults with type 1 diabetes to take account of associated features of diabetes, including • excess weight and obesity • underweight • eating disorders • hypertension • renal failure	Recommendation 3.4.11 - Modify nutritional recommendations to adults with type 1 diabetes to take account of associated features of diabetes, including: • excess weight and obesity • underweight • eating disorders • hypertension • renal failure • coeliac disease • gastroparesis	Addition of coeliac disease and gastroparesis as both also require modification of nutritional recommendations

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
15	Recommendation 1.4.13 - Be aware of appropriate nutritional advice on common topics of concern and interest to adults living with type 1 diabetes, and be prepared to seek advice from colleagues with more specialised knowledge. Suggested common topics include: • body weight, energy balance and obesity management • cultural and religious diets, feasts and fasts • foods sold as 'diabetic' • sweeteners • dietary fibre intake • protein intake • vitamin and mineral supplements • alcohol • matching carbohydrate, insulin and physical activity • salt intake in hypertension • comorbidities, including nephropathy and renal failure, coeliac disease, cystic fibrosis or eating disorders • use of peer support groups.	Recommendation 3.4.12 - Be aware of appropriate nutritional advice on common topics of concern and interest to adults living with type 1 diabetes, and be prepared to seek advice from colleagues with more specialised knowledge. Suggested common topics include: • body weight, energy balance and obesity management • cultural and religious diets, feasts and fasts • foods sold as 'diabetic' • sweeteners • dietary fibre intake • protein intake • vitamin and mineral supplements • alcohol • matching carbohydrate, insulin and physical activity • salt intake in hypertension • comorbidities, including nephropathy and renal failure, coeliac disease, cystic fibrosis or eating disorders • alternative diets e.g. ketogenic diet, very low calorie diet • use of peer support groups.	Include alternative diets in list to be aware of increasing usage of ketogenic and very low calorie diets in Ireland

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
16	Recommendation 1.5.2 - Give adults with type 1 diabetes who choose to integrate increased physical activity into a more healthy lifestyle information about: • appropriate intensity and frequency of physical activity • role of self-monitoring of changed insulin and/or nutritional needs • effect of activity on blood glucose levels (likely fall) when insulin levels are adequate • effect of exercise on blood glucose levels when hyperglycaemic and hypoinsulinaemic (risk of worsening of hyperglycaemia and ketonaemia) • appropriate adjustments of insulin dosage and/or nutritional intake for exercise and post-exercise periods, and the next 24 hours • interactions of exercise and alcohol • further contacts and sources of information	Recommendation 3.5.2 - Give adults with type 1 diabetes who choose to integrate increased physical activity into a more healthy lifestyle information about: • importance of planning activity • appropriate intensity and frequency of physical activity • role of self-monitoring of changed insulin and/or nutritional needs • effect of activity on blood glucose levels (likely fall) when insulin levels are adequate • effect of exercise on blood glucose levels when hyperglycaemic and hypoinsulinaemic (risk of worsening of hyperglycaemia and ketonaemia) • appropriate adjustments of insulin dosage and/ or nutritional intake for exercise and post-exercise periods, and the next 24 hours • interactions of exercise and alcohol • further contacts and sources of information.	Agreement of GDG to strengthen importance of planning of physical activates by patients with type 1 diabetes as the starting point to taking into account all of the areas listed

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
17	Recommendation 1.6.11 - Support adults with type 1 diabetes to test at least 4 times a day, and up to 10 times a day if any of the following apply: • the desired target for blood glucose control, measured by HbA1c level (see recommendation 41), is not achieved • the frequency of hypoglycaemic episodes increases • there is a legal requirement to do so (such as before driving, in line with the Driver and Vehicle Licensing Agency[DVLA] At a glance guide to the current medical standards of fitness to drive) • during periods of illness • before, during and after sport • when planning pregnancy, during pregnancy and while breastfeeding • if there is a need to know blood glucose levels more than 4 times a day for other reasons (for example, impaired awareness of hypoglycaemia, high-risk activities).	Recommendation 3.6.11 - Support adults with type 1 diabetes to test at least 4 times a day, and up to 10 times a day if any of the following apply: • the desired target for blood glucose control, measured by HbA1c level (see recommendation 1.6.6), is not achieved • the frequency of hypoglycaemic episodes increases • there is a legal requirement to do so (such as before driving, in line with the Road Safety Authority (RSA) Sláinte agus Tiomáint Medical Fitness to Drive Guidelines) • during periods of illness • before, during and after vigorous exercise • when planning pregnancy, during pregnancy and while breastfeeding (see the HSE Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus from Pre-conception to the Postnatal period) • if there is a need to know blood glucose levels more than 4 times a day for other reasons (for example, impaired awareness of hypoglycaemia, high-risk activities).	Reference to Irish guidelines. Replace sport with vigorous exercise based on feedback from external consultation*

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
18	Recommendation1.6.14 - Advise adults with type 1 diabetes who choose to test after meals to aim for a plasma glucose level of 5–9 mmol/litre at least 90 minutes after eating. (This timing may be different in pregnancy – for guidance on plasma glucose targets in pregnancy, see the NICE guideline on diabetes in pregnancy.)	Recommendation 3.6.14 - Advise adults with type 1 diabetes who choose to test after meals to aim for a plasma glucose level of 5–9 mmol/litre at least 90 minutes after eating. (This timing may be different in pregnancy – for guidance on plasma glucose targets in pregnancy, see the NICE guideline on diabetes in pregnancy and the HSE Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus from Pre-conception and NICE guidelines on diabetes in pregnancy).	Reference to Irish guidelines
19	Recommendation 1.6.18 - Educate adults with type 1 diabetes about how to measure their blood glucose level, interpret the results and know what action to take. Review these skills at least annually	Recommendation 3.6.18 - Educate adults with type 1 diabetes about how to measure their blood glucose level, interpret the results and know what action to take. Review these skills at least annually. Patients should be aware of potential sources of blood glucose meter errors, appropriate quality control techniques and need for meter replacement every 2 years.	Education should include education on blood glucose meters, quality control of these and replacement every 2 years based on external consultation feedback*

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
20	Not applicable	Recommendation 3.6.25 - Flash glucose monitoring is becoming available, but NICE has not formally evaluated its clinical and cost effectiveness. In the interim, NICE has issued a briefing, available at https://www.nice.org.uk/advice/mib110/chapter/Summary. It is noted that this technology does not completely replace capillary blood glucose monitoring. Patients will continue to require SMBG in addition to flash monitoring.	Include reference to use of flash glucose monitoring which are now available on the Irish market
21	Not applicable	Recommendation 3.6.26 - Refer to local guidelines and protocols for patients who are using flash glucose monitoring or real time continuous glucose monitoring as they will require education on the onset and duration of action of the different formulations of insulin and the risk of insulin accumulation or stacking after repeated insulin boluses.	As above

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
22	Recommendations 1.7.3, 1.7.4. and 1.7.5 • Offer twice-daily insulin detemir as basal insulin therapy for adults with type 1 diabetes. • Consider, as an alternative basal insulin therapy for adults with type 1 diabetes: an existing insulin regimen being used by the person that is achieving their agreed targets once-daily insulin glargine or insulin detemir if twice-daily basal insulin injection is not acceptable to the person, or once-daily insulin glargine if insulin detemir is not tolerated. • Consider other basal insulin regimens for adults with type 1 diabetes only if the regimens in recommendations 1.7.3 and 1.7.4 do not deliver agreed targets. When choosing an alternative insulin regimen, take account of the person's preferences and acquisition cost.	Recommendation 3.7.3,3.7.4 and 3.7.5 - In 2015 NICE recommended the following as the most cost-effective option based on network meta-analysis and modelling: • Offer twice-daily insulin detemir as basal insulin therapy for adults with type 1 diabetes. • Consider, as an alternative basal insulin therapy for adults with type 1 diabetes: • an existing insulin regimen being used by the person that is achieving their agreed targets • once-daily insulin glargine or insulin detemir if twice-daily basal insulin injection is not acceptable to the person, or once-daily insulin glargine if insulin detemir is not tolerated. Since 2015 a number of alternative long- acting insulins have become available in Ireland. • Newer basal insulin analogues such as once daily insulin degludec (Tresiba) or once daily U300 insulin glargine (Toujeo) have not been evaluated in the NICE guideline. In the interim, NICE published advice, available at https://www.nice.org.uk/advice/esnm24/chapter/key-points-from-the-evidence and https://www.nice.org.uk/advice/esnm62/chapter/Key-points-from-the-evidence. Refer to local guidance and protocols on their use	Acknowledge the use of newer basal insulins in Ireland. Clarify timing of NICE recommendations based on external consultation feedback*

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
		• Consider other basal insulin regimens for adults with type 1 diabetes only if the regimens in recommendation 1.7.3 and 1.7.4 do not deliver agreed targets. When choosing an alternative insulin regimen, take account of the person's preferences and acquisition cost.	
23	Recommendation 1.7.6 - For guidance on the use of continuous subcutaneous insulin infusion (CSII or insulin pump) therapy for adults with type 1 diabetes, see Continuous subcutaneous insulin infusion for the treatment of diabetes mellitus (NICE technology appraisal guidance 151).	Recommendation 3.7.6 - For guidance on the use of continuous subcutaneous insulin infusion (CSII or insulin pump) therapy for adults with type 1 diabetes, refer to the HSE Product Evaluation Group (Insulin pumps and Consumables) guidelines.	Reference to Irish insulin pump procurement process and care pathways within this process
24	Recommendation 1.14.7 -From the time of admission, the adult with type 1 diabetes and the team caring for him or her should receive, on a continuing basis, advice from a trained multidisciplinary team with expertise in diabetes	Recommendation 3.14.7 - From the time of admission, the adult with type 1 diabetes and the team caring for him or her should receive, on a continuing basis, advice from and access to a trained multidisciplinary team with expertise in diabetes.	Include "access to" diabetes multidisciplinary team during an adult with Type 1 diabetes inpatient stay to strengthen importance of review by members of the diabetes multidisciplinary team based on external consultation feedback*

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
25	Recommendation 1.14.8 -Throughout the course of an inpatient admission, respect the personal expertise of adults with type 1 diabetes (in managing their own diabetes) and routinely integrate this into ward-based blood glucose monitoring and insulin delivery.	Recommendation 3.14.8 -Throughout the course of an inpatient admission, respect the personal expertise of adults with type 1 diabetes (in managing their own diabetes) and if their condition allows, routinely integrate this into ward-based blood glucose monitoring and insulin delivery	Agreement of GDG to clarify 'if condition allows' as may not always be appropriate for a patient to continue to self-manage their diabetes in hospital
26	Recommendation 1.14.9 -Throughout the course of an inpatient admission, the personal knowledge and needs of adults with type 1 diabetes regarding their dietary requirements should be a major determinant of the food choices offered to them, except when illness or medical or surgical intervention significantly disturbs those requirements.	Recommendation 1.14.9 - Throughout the course of an inpatient admission, the hospital catering service should provide a good choice of nutritious meals that can accommodate patients' specific dietary requirements. All patients should have a choice of food, including those on a texture-modified diet, therapeutic diet, ethical or cultural diets. This includes patients in emergency departments who are deemed to be admitted to the hospital, but who remain in the emergency department while waiting for a hospital inpatient bed to become available (HIQA 2016)	Reference to Irish recommendations based on external consultation feedback

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
27	Not applicable	Recommendation 3.15 - Women of reproductive age should be informed of the importance of optimising management of their diabetes prior to pregnancy and should have access to pre-pregnancy care. (See HSE Guidelines for the Management of Pre-gestational and Gestational Diabetes Mellitus from Pre-conception to the postnatal period and NICE Diabetes in Pregnancy guidelines)	Include recommendation on importance of pre-pregnancy care for all women of reproductive age with diabetes as part of type 1 diabetes care*
28	Not applicable	Recommendation 3.16.2 - All patients with type 1 diabetes should be registered with the National Retinopathy Screening Programme	Eye disease section amended based on recommendation of Irish National Retinal Screening Programme/ RetinaScreen
29	Recommendation 1.15.2 -Depending on the findings, follow structured eye screening by: • routine review annually or • earlier review or • referral to an ophthalmologist.	Recommendation 3.16. 4 -Depending on the findings, follow structured eye screening by: • routine review annually by digital photographic screening via RetinaScreen or by clinical exam or • earlier review or • referral to an ophthalmologist if indicate	As above

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
30	Recommendation 1.15.9 - Refer to an ophthalmologist for: • referable maculopathy: -exudate or retinal thickening within 1 disc diameter of the centre of the fovea -circinate or group of exudates within the macula (the macula is defined here as a circle centred on the fovea, of a diameter the distance between the temporal border of the optic disc and the fovea) -any microaneurysm or haemorrhage within 1 disc diameter of the centre of the fovea, only if associated with a best visual acuity of 6/12 or worse • referable pre-proliferative retinopathy: -any venous beading -any venous reduplication -any intraretinal microvascular abnormalities (IRMA) -multiple deep, round or blot haemorrhages (If cotton wool spots are present, look carefully for the above features, but cotton wool spots themselves do not define pre-proliferative retinopathy)	Recommendation 3.16.10 - Refer to an ophthalmologist/ Diabetic Retinal Treatment Clinic for: • referable maculopathy: -exudate or retinal thickening within 1 disc diameter of the centre of the fovea -circinate or group of exudates within the macula (the macula is defined here as a circle centred on the fovea, of a diameter the distance between the temporal border of the optic disc and the fovea) -any microaneurysm or haemorrhage within 1 disc diameter of the centre of the fovea, only if associated with a best visual acuity of 6/12 or worse • referable pre-proliferative retinopathy for any of the following: -multiple deep, round or blot haemorrhages -venous beading -venous reduplication -intraretinal microvascular abnormalities (IRMA) (Cotton wool spots are not diagnostic of pre-proliferative retinopathy but should promote a careful search for other lesions)	As above
31	Recommendation 1.15.10 - For guidance on managing kidney disease in adults with type 1 diabetes, see the NICE guideline on chronic kidney disease.	Recommendation 3.16.11 - For guidance on managing kidney disease in adults with type 1 diabetes, refer to local standards and guidelines of care	Reference Irish guidelines

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
32	Recommendation 1.15.19 - For guidance on managing chronic painful diabetic neuropathy in adults with type 1 diabetes, see the NICE guideline on neuropathic pain – pharmacological management.	Recommendation 3.16.20 - For guidance on managing chronic painful diabetic neuropathy in adults with type 1 diabetes, refer to HSE Integrated Care Model for Type 2 diabetes and ICGP Practical Guide to Type 2 Diabetes.	Reference Irish guidelines
33	Recommendation 1.15.28 - For treating vomiting caused by gastroparesis in adults with type 1 diabetes: • consider alternating use of erythromycinm and metoclopramiden • consider domperidonel only in exceptional circumstances (that is, when it is the only effective treatment) and in accordance with MHRA guidance	Recommendation 3.16.29 - For treating vomiting caused by gastroparesis in adults with type 1 diabetes: • consider alternating use of erythromycin and metoclopramide • consider domperidone only in exceptional circumstances (that is, when it is the only effective treatment) and in accordance with European Medicine Agency and HPRA	Reference Irish guidelines
34	Recommendation 1.15.34 - If simple analgesia does not provide sufficient pain relief for adults with type 1 diabetes who have acute painful neuropathy resulting from rapid improvement of blood glucose control, offer treatment as described in the NICE guideline on neuropathic pain – pharmacological management. Simple analgesia may be continued until the effects of additional treatments have been established	Recommendation 3.16.35 - If simple analgesia does not provide sufficient pain relief for adults with type 1 diabetes who have acute painful neuropathy resulting from rapid improvement of blood glucose control, offer treatment as described in the HSE Integrated Model of Care for Type 2 diabetes and ICGP Practical Guide to Type 2 Diabetes. Simple analgesia may be continued until the effects of additional treatments have been established	Reference Irish guidelines

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
35	Recommendation 1.15.36 - For guidance on preventing and managing foot problems in adults with type 1 diabetes, see the NICE guideline on diabetic foot problems.	Recommendation 3.16.37 - For guidance on preventing and managing foot problems in adults with type 1 diabetes, see the HSE Model of Care for the Diabetic foot and HSE National Best Practice and Evidence Based Guidelines for Wound Management	Reference Irish guidelines. Reference to HSE National Best Practice and Evidence Based Guidelines for Wound Management based on external consultation feedback*
36	Recommendation 1.15.41 -Psychological problems	Recommendation 3.16.42 Psychological and Mental Health problems	Based on external consultation feedback from Mental Health Services*

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
37	Recommendation 1.15. 42 - Diabetes professionals should: • ensure that they have appropriate skills in the detection and basic management of non-severe psychological disorders in people from different cultural backgrounds • be familiar with appropriate counselling techniques and drug therapy, while arranging prompt referral to specialists of those people in whom psychological difficulties continue to interfere significantly with wellbeing or diabetes self-management. See also the NICE guidelines on common mental health disorders, generalised anxiety disorder and panic disorder (with or without agoraphobia) in adults and depression in adults with a chronic health problem.	Recommendation 3.16.43 - Diabetes professionals should: • ensure that they have appropriate skills in the detection and basic management of non-severe psychological disorders in people from different cultural backgrounds • be familiar with appropriate counselling techniques and drug therapy, while arranging prompt referral to specialists of those people in whom psychological difficulties continue to interfere significantly with wellbeing or diabetes self-management. • Diabetes healthcare professionals should collaborate with Mental Health Services(including Clinical Psychology as part of a Liaison Mental Health Team and/or Community Mental Health Services) to establish pathways to ensure that when required, patients with type 1 diabetes have rapid access to Mental Health Services	Agreement of GDG that there was a need to include recommendation on access when required to mental health MDT's. Wording changed following external consultation feedback from Mental Health Services*

	Original wording from NICE NG17	Recommendation following contextualisation for this guideline	Rationale for Contextualisation
38	Recommendation 1.15.43 -Members of diabetes professional teams should be alert to the possibility of bulimia nervosa, anorexia nervosa and insulin dose manipulation in adults with type 1 diabetes with: over-concern with body shape and weight,low BMI, hypoglycaemia, suboptimal overall blood glucose control. See also the NICE guideline on eating disorders	Recommendation 3.16.44 - Members of diabetes professional teams should be alert to the possibility of bulimia nervosa, anorexia nervosa and insulin dose manipulation in adults with type 1 diabetes with: • over-concern with body shape and weight • low BMI • hypoglycaemia • suboptimal overall blood glucose control. See HSE Model of Care for Eating Disorders, available at http://www.hse.ie/eng/about/Who/cspd/ncps/mental-health/eating-disorders/	Reference to Irish guideline based on external consultation feedback from Mental Health Services*

*Recommendations that have been contextualised following feedback received from the external consultation process

Appendix 3: Consultation Process

For the initial 2018 document the representative groups and bodies listed below were given notice of the consultation and sent the requisite details on how to make a submission. They were asked to bring the consultation to the attention of people living with type 1 diabetes, their respective professional bodies and all healthcare professionals working in healthcare settings which care for people with type 1 diabetes is received or commissioned.

Appendices Table 2 – List of groups or representative bodies who were invited to participate in the consultation process
Department of Health Deputy Chief Medical Office
Diabetes Ireland
Dr Colm Henry, HSE National Clinical Advisor and Group Lead for Acute Hospital Division
Dr Orlaith O'Reilly, HSE National Clinical Advisor and Group Lead for Health and Well being
Dr Philip Dodd, HSE National Clinical Advisor and Group Lead for Mental Health
Dr David Hanlon, HSE National Clinical Advisor and Group Lead for Primary Care
HSE National Clinical Advisor and Group Lead for Social Care
Irish College of General Practitioners
Dr Velma Harkins, author of ICGP Guidelines A Practical Guide to Integrated Type 2 Diabetes Care
Irish Diabetes Nurse and Midwife Specialist Association
Irish Nutrition and Dietetic Institute
National Clinical Programme Clinical Advisory Group including all hospital endocrinologists
National Clinical Programme for Diabetes Working Group which includes representatives from physiotherapy, hospital and community pharmacy, podiatry, dietetics, hospital and community nursing, medical and academia.
Office of Health and Social Care Professionals
Office of the Nursing and Midwifery Services Director
Society of Chiropodists and Podiatrists Ireland
Psychologists in Diabetes Care Group

The template for consultation asked for comments on how user friendly the document is, the content and the implementation of the draft guideline. The following are the questions reviewers were asked to comment on;

1. User friendliness

a) Is the draft guideline easy to read?

b) Do you think the guideline will be easy to use in practice?

2. Content

a) Do the recommendations cover the scope of the draft guideline?

b) Do the recommendations clearly link to the evidence presented?

c) Does the draft guideline consider the views and needs of this population group?

d) Does the draft guideline consider gaps in the current evidence?

3. Implementation

a) Do any recommendations change current practice substantially? If so, do you consider that the reasons given in the draft guideline explain why the change is necessary?

b) Which areas do you think may be difficult to put into practice? Please explain why.

c) What would help users to implement the guideline? (For example, useful checklists, patient information leaflets etc.)

Extensive consultation feedback was received from patients, patient advocacy groups, healthcare professionals, professional groups and industry. Healthcare professional groups that provided feedback included hospital consultants, nursing, dietetics, podiatry, clinical psychology and mental health services. Please refer to appendix 2B, table 6 which outlines under the rationale for contextualisation, the recommendations that have been contextualised following this feedback received from the external consultation process, which were marked with an asterisk (*).

Appendix 4: Implementation plan 2018

1. Introduction

The following implementation plan is designed to provide a framework to guide the actions required to promote and support effective implementation locally and nationally of the Adult type 1 diabetes mellitus National Clinical Guideline in Ireland. The national implementation of cost-effective evidence-based care will ultimately improve health outcomes for patients, reduce variation in practice and improve the quality of clinical decisions that patients and healthcare staff have to make. This guideline will also inform patients about the care they should be receiving and assist them to make healthcare choices based on best available information.

Following completion of a national survey of Acute Hospital Adult Diabetes Services by the National Clinical Programme (NCP) for Diabetes in 2017 it was found that many of the guideline recommendations, such as diagnosis, clinical monitoring of glucose control, insulin regimens, and treatment and monitoring of specific complications are already established as part of routine care for patients with type 1 diabetes. As part of the National Pancreas Transplantation Programme, which was established in St Vincent's Hospital in 2016, planning has commenced to establish an endocrinology led islet transplant service for patients with type 1 diabetes within Ireland. However, there are two key recommendations that are not yet established as routine care and are currently not widely available in Ireland. The guideline recommends that high quality structured patient education must be incorporated into routine care for all people with diabetes. It also recommends the measurement of HbA1c levels every 3–6 months in adults with type 1 diabetes. To facilitate implementation of this guideline there is a requirement to ensure access to high quality structured patient education (SPE) and access to a minimum of 2 consultations with a diabetes healthcare provider per year for all adults with type 1 diabetes. These recommendations will be the primary focus of this guideline implementation plan.

Outside of the scope of this implementation plan, but an area which the NCP for Diabetes acknowledge as a deficit in current care is access to mental health services for all people living with diabetes. It is recommended that clinicians have a high index of suspicions for co-morbid mental illnesses such as depression and eating disorders especially where there is chronic hyperglycaemia, low body mass index or recurrent diabetic ketoacidosis (DKA). Current international guidelines specifically recommend that a psychiatric opinion is sought where a patient presents with two or more episodes of DKA without any clear precipitant such as infection (JBDS & RCPsych, 2018). High quality structured patient education has been shown to improve the psychological adjustment to living with type 1 diabetes. However the NCP for Diabetes recognise the need to develop a strategy in collaboration with colleagues in mental health services to increase the psychological knowledge of the diabetes healthcare professionals in the secondary care setting, while also providing a clearer path of referral for rapid access to mental health professionals when required.

2. Baseline Survey of Acute Hospital Services Adult Type 1 diabetes Care

Table 1: Summary of Baseline Survey of Acute Hospital Services Adult Type 1 diabetes Care	
Estimated Numbers of Patients with Type 1 diabetes	19748*
Percentage of Diabetes Services Providing Access to Speciality Type 1 Diabetes Clinics	
Transition Clinic	35%
Young Adult Clinic	52%
Type 1 Diabetes Clinic	45%
Insulin Pump Clinic	39%
Percentage of Diabetes Services Meeting Recommended Recall Time for Adults with Uncomplicated type 1 diabetes	
4 – 6 months	42%
Percentage of Diabetes Services Meeting Recommended Recall Time for Young Adults with Uncomplicated type 1 diabetes	
4-6 months	65%
Structured Patient Education provision in 2016	
• 58% of hospital services provide access to a structured patient education programme	
• 19% of hospital services provide access to a structured education programme which meets the standards set out in the guideline	
• A total of 409 patients completed a programme in 2016, 158 patients completed a programme which meets the standards set out in the guideline	

3. Strategic Aims

The core objectives of this implementation plan are as follows;

- Outline the framework to provide access to a high quality SPE programme for eligible adults with type 1 diabetes in Ireland 6 – 12 months after diagnosis or at another appropriate time.
- To provide access to a minimum of 2 consultations with a diabetes healthcare provider per year for all adults with type 1 diabetes.

4. Approach to Implementation

The implementation of an adult type 1 diabetes NCG are dependent on a range of factors, most importantly the engagement by all relevant stakeholders in the process. For successful implementation, there are significant facilitators but there will also be potential barriers which have to be considered and overcome (see fig 1 Logic Model) some of which have been identified below.

Facilitators to Implementation

- Patient need and desire
- Current outcomes for Irish patients with type 1 diabetes, data suggests suboptimal level of diabetes control and elevated HbA1c's (Casey et al, 2014)

- Appropriately qualified dedicated diabetes healthcare professionals
- Current practice in many diabetes units
- The evidence from clinical research which forms the basis for these guideline recommendations. This guideline has been developed in conjunction with the NICE in the UK. Ireland is only the second country NICE have facilitated to contextualise one of their guidelines
- Patient representatives and representatives of all healthcare professionals involved in the care of people with type 1 diabetes on the guideline development group
- Support from the outset was sought and received from senior policy and service decision makers within the NCEC, DOH and HSE. Ministerial endorsement of the guideline will follow final sign off by these organisations.
- Hospital group network
- National HSE Structured Patient Education Co-ordinator
- HSE Database for Structured Patient Education which is currently under development and will allow collection of data electronically on education programmes.

Potential Barriers to implementation

- Lack of awareness by people with diabetes and healthcare professionals of the guideline
- Resistance to change work practices or acceptance that the status quo is adequate
- Capacity of hospital groups to implement due to staffing deficits
- Financial resources to allow procurement of a national structured patient education programme, to facilitate ongoing training and to purchase resources
- Lack of awareness by people with diabetes of the benefit and importance of attendance at structured patient education programmes
- Lack of awareness by healthcare professionals of the benefit and importance to refer people with diabetes, and encourage attendance at structured education programmes
- The requirement for hospital sites within hospital groups to work together to reach a hospital group target
- Lack of information and communications technology (ICT) systems to facilitate sharing of information across sites
- Lack of ICT systems to facilitate an annual national diabetes audit.

Activities and Outputs

This plan designed by the GDG will be implemented through the following approaches to harness the facilitators and overcome the barriers;

- Create awareness and generate buy-in for implementation through a comprehensive communication strategy for all relevant stakeholders including patients, diabetes healthcare providers, DOH, HSE Acute Hospital Division, hospital groups and professional bodies. The process of generating awareness will commence at the start of guideline development and be maintained every step of the way, including after the guideline has been implemented and the care is being delivered.

- Patients and all healthcare providers involved in the provision of care for patients with type 1 diabetes were invited to review the guideline during the consultation process.
- Full guideline including budget impact analysis and implementation plan will be easily accessible on the DOH NCEC website.
- Once the guideline has been published, representatives from the guideline development group and from the National Clinical Programme for Diabetes will visit key personnel from each hospital group in order to assist in assessment of individual hospital group needs, fit, feasibility, capacity and readiness.
- Effective implementation through development of local action plans based on local structures and arrangements.
- Identifying hospital group clinical leads for type 1 diabetes care.
- Determining and arranging staff training and support requirements for effective implementation.
- Effective monitoring and evaluation through the development of an audit dataset to assess the implementation of the guideline to include HbA1c measurements, recall times for uncomplicated adult with type 1 diabetes and access and attendance at SPE programmes, refer to appendix 5.
- Analysis and feedback of audit data.

Strategic Aim 1 - To provide access to high quality structured patient education (SPE) programme for eligible adults with type1 diabetes in Ireland 6 – 12 months after diagnosis or at another appropriate time

Proposed Roll out of high quality SPE programme for type 1 diabetes nationally

A proposed model to ensure equity of access to high quality SPE for type 1 diabetes is for;

- A National procurement process for a SPE programme which meets criteria outlined in the guideline. This procurement process will be conducted through HSE procurement.
- Information sessions to be arranged in each Hospital Group emphasising a Hospital Group-wide approach to guideline implementation. The location of education delivery within each hospital group should be agreed between the hospitals within the group. The education could be delivered on one site, however it is likely that the education will be delivered across several sites. The education does not have to be delivered in the hospital setting if suitable alternative arrangements can be found. Each group will require a minimum of 6-8 educators per hospital group depending on population and geographical distribution. It is hoped that staff from multiple hospitals within each group will participate in delivering structured education.
- Patients with type 1 diabetes must be entitled to health leave for the purpose of attending the education programme.
- Each hospital group should aim to deliver 50 courses annually to a minimum of 6 patients per course. This level of activity would result in approximately 1800 patients being trained on a yearly basis. With an estimated 20,000 patients with type 1 diabetes living in Ireland, the majority of whom have not yet attended structured education, it would still take approximately 10 years for all adult patients with type 1 diabetes in Ireland to receive structured education.
- Each hospital group should have a clinical lead to oversee all aspects of type 1 diabetes care, including delivery of structured education.

- Educators must be facilitated by the hospital group to work across multiple hospital sites within that hospital group, this includes travel costs, flexible hours to allow delivery of education outside normal working hours and online supports. The governance and indemnity issues will have to be addressed to facilitate people working across sites. It must also ensure that patients who have completed high quality SPE have access to structured follow-up and appropriate clinics.
- Develop an education module to train all health care professionals working with people with type 1 diabetes that supports CHO counting, insulin adjustment and promotes diabetes self-management.
- Develop key performance indicators and thereafter annual audit of key performance indicators relating to delivery of high quality structured patient education across each hospital and each hospital group.

Workforce requirements

In order for a hospital group to establish high quality SPE for type 1 diabetes they must identify a minimum of 6 educators per hospital group at any given time (3 Diabetes Specialist Nurses and 3 Senior Diabetes Dietitians). The majority of educators will come from existing staff but a minimum of one additional diabetes nurse specialist and one additional senior dietitian must be resourced within each hospital group. Educators may come from any of the hospitals within the group resulting in an 'educator pool'. Each hospital group must also identify at least 1 doctor per centre to attend the doctor training programme.

To support the sizable administrative workload associated with scheduling, course preparation, follow up data entry, reporting nationally and ordering of supplies for delivery, 1 WTE administrative person to provide clerical support must be resourced within each hospital group.

Training and resource costs for service

Set up costs for a SPE programme in a hospital group not currently delivering, consists of staff training costs, plus purchase of a set of teaching resources. Given the scale of education required and the number of staff members who will require education, to improve accessibility and affordability training courses will need to be available in Ireland.

In addition to the training of the SPE educators, all staff who deliver care to people with type 1 diabetes should have access to training that supports patient empowerment and diabetes self-management – CHO counting and insulin adjustment. This will necessitate availability of short courses being available for all staff on a rolling basis to ensure all healthcare professionals are SPE aware. This will allow ongoing support for patients on return to their base hospital.

On-going educational updates for staff will require regular regionalised short courses for staff and core training for educators to be available in Ireland annually.

Staff costs

- A minimum of 1 additional Diabetes Specialist Nurse and 1 additional Senior Diabetes Dietitian are required per hospital group to expand or establish access to high quality structured education programme for eligible adults with type 1 diabetes in Ireland based on current staffing numbers from National Survey of Acute Hospital Diabetes Services and Resources 2017.
- 1 administrative person to provide clerical support within each hospital group.

ICT

Each diabetes unit should have access to the necessary ICT resources in order to facilitate audit of the care of patients with type 1 diabetes.

Lead for Implementation

The overall responsibility for monitoring and optimising the delivery of SPE will rest with the NCP for Diabetes working with the National Structured Patient Education Co-ordinator and Hospital Groups. The programme will ensure that annual audit is conducted, reported and evaluated. High quality SPE programme for type 1 diabetes will be delivered by hospital staff only within secondary care. The NCP will work with hospital groups that are challenged to establish or maintain KPIs relating to SPE in order to optimise outcome. The NCP will work closely with the National Structured Patient Education Co-ordinator, to ensure that the implementation plan succeeds.

Timeline

Implementation will take place over the next 4 years. Successful implementation of this plan will be dependent on securing resources outlined above.

- Year 1- completion of procurement process, recruitment of additional staff and establishment of hospital group based strategies for delivery of education.
- Year 2- training of educators. Training of all diabetes health care professionals. Commencement of education programmes. Inaugural type 1 diabetes SPE annual audit.
- Year 3- expansion of education programmes, audit type 1 diabetes SPE.
- Year 4- each hospital group delivering over 50 group education programmes per year, audit type 1 diabetes SPE.

Strategic Aim 2 - To provide access to a minimum of 2 consultations with your diabetes healthcare provider per year for all adults with type 1 diabetes.

The National Clinical Programme for Diabetes promote a model of integrated care for delivery of diabetes care in Ireland. In this model of care, people with uncomplicated type 2 diabetes will have their care managed in primary care only. People with complicated type 2 diabetes will be managed between primary and secondary care. People with type 1 diabetes will be managed in secondary care only. This Model of Care is fully aligned with the ICGP (2016) Guidelines, A Practical Guide to Integrated Type 2 Diabetes Care.

People with type 1 diabetes, represent approximately 10% of adults diagnosed with diabetes. People with type 1 diabetes need education and support from healthcare professionals with specific expertise in nutrition, physiology and therapeutics to manage their diabetes effectively and should have access to a minimum of 2 consultations annually with the specialist diabetes team.

Workforce requirements

Staff requirement to provide access to a minimum of 2 consultations per year needs to be reviewed on a hospital by hospital basis. This will be supported by the National Clinical Programme for Diabetes working with the hospital groups and individual hospitals. Services must be encouraged to evaluate and modify some aspects of their current activity. Adequate resources are required in primary care to support the transition towards integrated diabetes care, which relocates care of people with uncomplicated type 2 diabetes from hospital to primary care. The introduction of the Cycle of Care for Diabetes is the first

step in the reimbursement of structured diabetes care in general practice. It resources GPs to provide two structured visits each year for patients with type 2 diabetes. Between 2015 and 2016, almost 85,000 patients were registered for the scheme, accounting for €11.25 million in payments to GPs. This investment in primary care is intended to improve the provision of timely, appropriate and efficient care for patients with type 2 diabetes while addressing the capacity constraints within diabetes specialist clinics. Expansion and consolidation of this level of service in primary care should be addressed through the GP contract. Full implementation of the National Model of Integrated Care for Type 2 Diabetes and the ICGP diabetes guidelines will increase capacity within diabetes specialist clinics to ensure that patients with type 1 diabetes and those complex patients with type 2 diabetes can be reviewed with appropriate frequency. It is anticipated that for centres that are not currently meeting the recommended frequency of appointments, the necessary resources to provide twice yearly visits will be secured through the redistribution of resources, supported by the investment in primary care for type 2 diabetes.

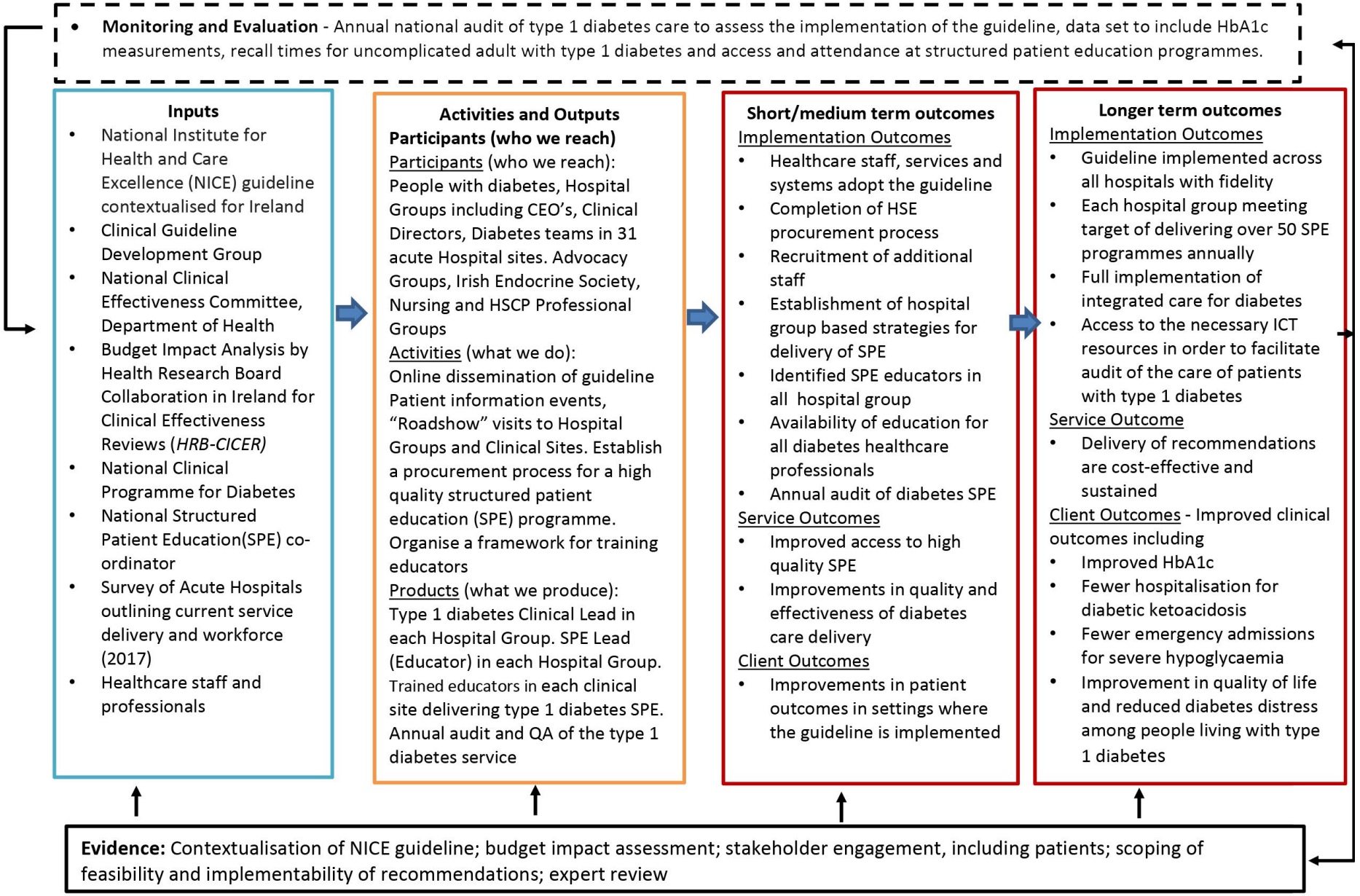
Evaluation and Monitoring

Recall times for adult with uncomplicated type 1 diabetes should be included as part of an audit of diabetes care.

ICT

Each diabetes unit should have access to the necessary ICT resources in order to facilitate audit of the care of patients with type 1 diabetes.

Figure 1: Logic Model – Implementation of Adult Type 1 Diabetes Guideline



Implementation Plan – update 2024

In this rapid update, the majority of guideline recommendations are unchanged. The most substantial new recommendation with potential implications for implementation and budget is the recommendation to make continuous glucose monitors available to all people with type one diabetes.

> ***3.6.10:*** *Offer adults with type 1 diabetes a choice of real-time continuous glucose monitoring (rtCGM) or intermittently scanned continuous glucose monitoring*.

While this is an important new recommendation within the updated guideline, in practice in Ireland, patients with type 1 diabetes already have widespread access to continuous glucose monitors, and as such their use is already embedded in the system. Over 50% of patients with type 1 diabetes in Ireland are currently using continuous glucose monitors. In 2023, following a request from the office of the Chief Clinical Officer at the HSE, the Health Information and Quality Authority (HIQA) published a Health Technology Assessment (HTA) of CGM focused exclusively on adults with type 1 diabetes mellitus (HIQA, 2023). The aim of this rapid HTA was to provide advice on the clinical-effectiveness, cost effectiveness, and budget impact of providing CGM for adults with T1DM. The HIQA HTA recommended that all people with Type 1 Diabetes should have access to CGM. The HSE Medicines Management Programme subsequently established a Managed Access Programmes for CGM. The implementation of these recommendations relating to CGM from the 2024 Rapid Update to this guideline will be guided the Medicines Management Programme guidance for the Managed Access Programme for all CGM systems for individuals with Type 1 Diabetes Mellitus.

The GDG would again like to take the opportunity to highlight the need for a national patient registry for people with diabetes in Ireland, similar to the National diabetes Audit that exists in the UK. A national patient registry would allow monitoring of progress in the uptake of the guideline recommendations and ensure that patients across the country have equitable access to quality diabetes care.

In terms of delivery of care in Diabetes Day Centres, the multidisciplinary team available to people with Diabetes Type 1 in the Diabetes Day Centre should include but is not limited to; Consultant Endocrinologist, Clinical Nurse Specialist, Advanced Nurse Practitioner (ANP), Dietitian, Podiatrist, Psychologist and administration.

The GDG wish to highlight the importance of careful transition of care from paediatric to adult services for people with type 1 diabetes. We know that young adults with type 1 diabetes are a particularly vulnerable group of patients who often struggle to manage their condition. Safe and careful transition of care, that has been well planned and managed before, during and after the actual “handing over” of care, is critical to ensure that people don’t disengage with their health care team and diabetes management. The GDG strongly support the recommendations of the national framework on transition of care from paediatric to adult services that is due to be published in late 2024. The forthcoming joint HIQA and the Mental Health Commission (MHC) Overarching National Standards for the Care and Support of Children using Health and Social Care Services may also be provide guidance for this important transitionary period.

Structured education: Update 2024

In the original 2018 guideline, a major recommendation was the expansion of access to structured education. Included below is an update to the progress that has been made so far with the rollout and expansion of structured education for people with type 1 diabetes in Ireland.

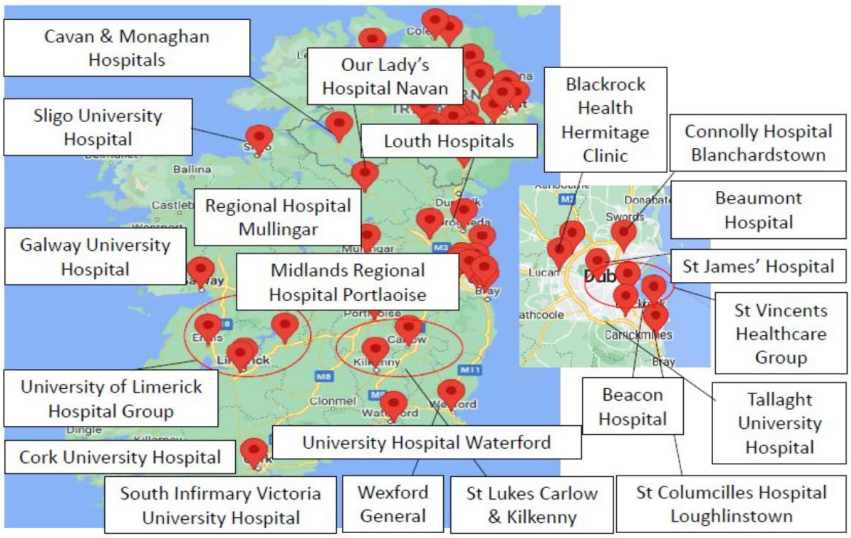
Overview of DAFNE implementation 2018-2024

When the 2018 NCEC guideline was developed there were seven DAFNE centres in Ireland – established mainly with support from the Irish DAFNE Study. The 2018 implementation plan aimed for 11 additional DAFNE sites over a 5-year period.

The National Diabetes Programme undertook a mapping exercise of DAFNE in Ireland in October 20231. We engaged with 37 hospital-based diabetes services across the six HSE Health Regions, including 21 services who were allocated 19.5 acute senior dietetic posts by the Integrated Care Programme for Prevention and Management of Chronic Disease (ICPCD) to support DAFNE. We gathered data on staffing, course delivery, and both opportunities/enablers and barriers/challenges to DAFNE delivery in Ireland. We also engaged with DAFNE Central and ascertained centralised anonymised data (available from 2016-2022) on course delivery and trained DAFNE educators in Ireland.

There has been a significant increase in DAFNE availability in Ireland and has exceeded the expectation of the 2018 implementation plan. In October 2023 there were 19 public and 2 private DAFNE Centres in Ireland, spread across 6 HSE Health Regions (see Figure 2). This represents an approx. 230% increase in DAFNE availability in Ireland since 2016. Course delivery is supported by 71 registered DAFNE educators and 26 registered DAFNE doctors. Course data between 2016-2022 in Ireland shows 191 courses with 1118 graduates. Currently centres deliver between 2 and 10 courses per year – mainly dependent on the number of trained educators. Delivery is, for the most part, online or hybrid with a small number of centres delivering face-to-face courses. Integrated Care Programme for Prevention and Management of Chronic Disease (ICPCD) funding was allocated for 19.5 dietetic posts, of which 12.5 (64.1%) have been filled. Of the 12 newer centres, 9 (75%) have used ICPCD funding to commence DAFNE, while 2 used existing staff resourcing, and 1 centre remains registered but the ICPCD posts are currently vacant.

Figure 2: DAFNE Centres in Ireland October 2023



2024 ongoing implementation plan for DAFNE:

The HSE, health regions, and individual healthcare institutions are responsible for the implementation of DAFNE. Training for new teams and support for ongoing training, clinical audit and resource needs is via the DAFNE Consortium https://dafne.nhs.uk/. It is recommended that local medical, dietetic, nursing and administrative leads are identified at each site, with appropriate protected time, to coordinate recruitment, implementation, and audit of DAFNE.

Some of the potential barriers and enablers for implementation of DAFNE are considered in the following table. This is not an exhaustive list; local issues should be identified and managed by each diabetes unit.

Table 7: Barriers and enablers for implementation of DAFNE

Barriers	Enablers
• Staff recruitment to funded posts and staff retention within existing sites • Difficulty in recruitment to DAFNE and increasing total numbers of DAFNE graduates in Ireland • Managing DAFNE waiting lists and throughput to DAFNE courses • Increasing DAFNE access via integration across hospitals, hospital groups and health regions • Integration of DAFNE with rapidly evolving diabetes technology	• Local support for recruitment and succession planning for DAFNE posts within diabetes services • National and local initiatives and protected time to promote recruitment and the benefits of DAFNE to people living with Type 1 diabetes • Embedding DAFNE in local Type 1 care pathways • Utilise existing software e.g. Healthcourse Manager to manage group based self-management education and support • Developing local pathways across sites with appropriate governance where diabetes staff are co-located • Involvement with the DAFNE Consortium to develop and embed new and innovative approaches to DAFNE

Appendix 5: Monitoring, evaluation and audit

The key objective of this NCEC National Clinical Guideline is to improve outcomes of care for people living with type 1 diabetes in Ireland over the next five years, provided that funding is secured through the annual service planning and estimates process. Critical to evaluating quality of care is the development of a system of audit of both the processes and outcomes of care to enable comparison with the National Guideline to help drive service developments and improved care delivery. A national diabetes register and audit when developed will use this NCEC National Clinical Guideline to set the standard of care for people living with type 1 diabetes.

It is recognised at present that ICT systems are not in place in Ireland to easily monitor the implementation of the recommendations made in this guideline. In the interim while we wait for the necessary ICT for a National Diabetes Register and audit, progress can be monitored in individual diabetes units. Collecting data is frequently challenging. However, meaningful and consistent reporting of outcomes inform clinicians and managers in their efforts to drive quality improvement in terms of identifying the potential for improvement and monitoring the results of new initiatives. Audit and monitoring criteria data are outlined in Table 7.

Table 8: Audit and monitoring criteria

Criteria	Target	Audited/monitored by	Possible source of data
HbA1c measurements	7.5% or less	Individual service/ NCP Diabetes	Patient notes, Laboratory ICT system
Total cholesterol	A level of below 5mmol/l	Individual service/ NCP Diabetes	Patient notes, Laboratory ICT system
Blood Pressure	Reading of less than 140/80mm/ Hg1	Individual service/ NCP Diabetes	Patient notes, Laboratory ICT system
Rates of complications (including severe hypoglycaemia)	Aim to see an annually reduction in complications	Individual service/ NCP Diabetes	Patient notes, ICT systems, HIPE
Attendance rates for uncomplicated adult with type 1 diabetes	Attendance at 2 appointments a year. Target >42%	Individual service/ NCP Diabetes	Patient notes, ICT systems
Access to high quality structured patient education	Within 1 year of diagnosis or at another appropriate time	Individual service/ NCP Diabetes/ National Structured Patient Education Co-ordinator	National Database for Structured Patient Education
HbA1c levels, hypoglycaemia rates and hospital admission due to diabetic ketoacidosis pre and post attendance at SPE	Aim to see a reduction in parameters post attendance at SPE	Individual service/ NCP Diabetes/ National Structured Patient Education Co-ordinator	National Database for Structuring Patient Education

Criteria	Target	Audited/monitored by	Possible source of data
Hospital discharges for type 1 diabetes-associated complications including diabetic ketoacidosis, kidney complications, ophthalmic and neurological conditions.	Less than number of discharges in 2016, less than 1959 discharges	HSE Business Intelligence Unit	HIPE

Appendix 6: Membership of the NICE Guideline Development Groups for the 2018 NCEC Guideline

Table 9: Members of the 2018 NICE Guideline Contextualisation Quality Assurance Team

Name	Job title and affiliation
Christine Carson	Programme Director
Phil Alderson	Clinical Advisor
Rachel O'Mahony	Technical Advisor
Andrew Gyton	Programme Manager

The NICE Guideline Development Group members listed in table 9 are those for the 2015 update. For the composition of the previous Guideline Development Group, see the full guideline (https://www.nice. org.uk/Guidance/NG17/Evidence)

Table 10: Members of the NICE Guideline Development Group (2015)

Name	Job title and affiliation
Stephanie Amiel	Professor of Diabetic Medicine, King's College London
Augustin Brooks	Consultant Diabetologist, Bournemouth Hospital
Arthur Durrant	Patient member
Michael Flynn	Consultant Physician, Kent and Canterbury Hospital
Roger Gadsby	Visiting Professor, Institute of Diabetes in Older People, University of Bedfordshire; GP; and Principle Teaching Fellow, University of Warwick
Peter Hammond	Consultant Physician, Harrogate District Hospital
Michael Kendall	Patient member
Vibhuti Mistry	Lead Diabetes and Obesity Dietitian, Homerton University NHS Foundation Trust
Henrietta Mulnier	Lecturer in Diabetes Nursing, King's College London
Victoria Ruszala	Specialist Pharmacist, Diabetes and Endocrinology, North Bristol NHS Trust
Stuart Smellie	Consultant in Chemical Pathology, Durham and Darlington NHS Foundation Trust
Perdy van den Berg	Clinical Lead, Oxfordshire Diabetes Service
Jill Cobb	Information Scientist
Dalia Dawoud	Health Economist
Bernard Higgins	Clinical Director
Elisabetta Fenu	Health Economics Lead
Bethany King	Document Editor/Process Assistant
Rachel O'Mahony	Senior Research Fellow
Nancy Pursey	Senior Project Manager

Table 11: Members of the NICE Project Team for the 2018 Guideline

Name	Job title and affiliation
Christine Carson	Guideline Lead
Phil Alderson	Clinical Adviser
Clifford Middleton	Guideline Commissioning Manager
Jennifer Wells	Guideline Coordinator
Nichole Taske	Technical Lead
Bhash Naidoo	Health Economist
Lyn Knott	Editor

Appendix 7: Abbreviations

The following abbreviations are used in this document:

ACE	Angiotensin-converting enzyme
ACR	Albumin creatinine ratio
AGREE II	Appraisal of Guidelines for Research and Evaluation II
ANP	Advanced Nurse Practitioner
BIA	Budget Impact Assessment
BMI	Body Mass Index
CES	Centre for Effective Services
CGM	Continuous glucose monitoring
CHO	Carbohydrate
CSII	Continuous Subcutaneous Insulin Infusion
DAFNE	Dose-adjustment for normal eating
DCCT	Diabetes Control and Complications Trial
DKA	Diabetic ketoacidosis
DOH	Department of Health
ECG	Electrocardiography
EDI	Euro Diabetes Index
eGFR	Estimated glomerular filtration rate
FIT	Forum for Injection Technique
GDG	Guideline Development Group
HbA1c	Haemoglobin A1c
HDL	High Density Lipoprotein
HIPE	Hospital In-Patient Enquiry
HIQA	Health Information and Quality Authority
HPRA	Health Products Regulatory Authority
HRB-CICER	Health Research Board-Collaboration in Ireland for Clinical Effectiveness Reviews
HSE	Health Service Executive
ICGP	Irish College General Practitioners
ICPCD	Integrated Care Programme for Prevention and Management of Chronic Disease
ICT	Information and Communication Technology
IDF	International Diabetes Federation
IFCC	International Federation of Clinical Chemistry

IRMA	Intraretinal microvascular abnormalities
ISO	International Organisation for Standardisation
LDL	Low Density Lipoprotein
MI	Myocardial infarction
NCEC	National Clinical Effectiveness Committee
NCP	National Clinical Programme
NCPD	National Clinical Programme for Diabetes
NG	National Guideline
NHQRS	National Healthcare Quality Reporting System
NICE	National Institute for Health and Care Excellence
NOTM	National Office of Traffic Medicine
OCED	Organisation for Economic Co-operation and Development
RSA	Road Safety Authority
SMBG	Self-monitoring of blood glucose
SPE	Structured Patient Education
TSH	Thyroid-stimulating hormone
UK	United Kingdom
WTE	Whole time equivalent

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