Model of Integrated Care for Patients with Type 2 Diabetes

A Guide for Health Care Professionals
(Clinical Management Guidelines)
Forward

This model of care is the blueprint for diabetes care and treatment in Ireland today as cognitively mapped in the first report of the diabetes expert advisory group in 2007. This document is a mapping of the most up to date evidence based standards as to be applied to people with diabetes. The model is backed by major developments in recent years such as the national diabetic retinal screening and treatment programme, the employment of many community specialist diabetes posts such as integrated care nurses, dieticians and podiatrists and the introduction of the cycle of care for significant numbers of persons with diabetes in Oct 2015. As the context of diabetes in Ireland is changing and will continue to evolve this framework is well grounded in Healthy Ireland and Healthy Weight for Ireland policies.

Transforming care services to tackle the magnitude of chronic diseases which are becoming the ‘norm’ is the big health challenge of our day for all developed health systems. In 2014 the EU recognised this and set up a joint action on chronic disease (EU JA CHRODIS 2014-17) to start addressing this issue and the conclusion being that much more needs to be done. In starting to address the problem healthy aging, the multimorbid patient and an example chronic disease (diabetes) were focused on. If health systems are to avoid collapse due to the challenge of chronic disease a focus on health promotion and accessible integrated pathways is needed. Ultimately cost effective use of the known evidence base for well-defined conditions will be key.

With 1 in 12 persons in Ireland over the age of 50 known to have diabetes and a large evidence base of effective interventions that impact on morbidity and mortality known, diabetes is well placed to demonstrate how healthy aging and living well with a long-term condition can be a new normal.

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Chapter 1

Integrated Model of Care for People with Type 2 Diabetes

1. Introduction

Diabetes mellitus is a metabolic disorder of multiple aetiology characterised by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects of insulin secretion, insulin action or a combination of both (Waas JH, Shalet SM 2002).

Diabetes is a serious global public health issue which has been described as the most challenging health problem in the 21st century (Zimmet et al, 2001, IDF 2013). Cases of diabetes have progressively increased worldwide; between 1980 and 2008 there was a two-fold increase in the number of adults with diabetes (Danaei et al. 2011). Type 2 diabetes is the main driver of the epidemic, accounting for approximately 90% of all cases (IDF, 2013). The increasing burden of diabetes is driven primarily by rising levels of obesity and an ageing population (IDF, 2013, Kearns et al, 2014). In Ireland, in people aged 18 years and over, the prevalence of diagnosed diabetes increased from 2.2% in 1998 to 5.2% in 2015; representing an absolute mean increase of 0.17% per year. In 2015, the incidence of diagnosed diabetes was 0.2/100 population (Tracey et al, 2016).

Diabetes places a significant burden of care on the individual, health care professionals and the wider health system (Zimmet et al, 2001, Venkat et al, 2000). Individuals with diabetes are two to four times more likely to develop cardiovascular disease relative to the general population and have a two to five-fold greater risk of dying from these conditions (Garcia et al, 1974, Roper et al, 2002) Diabetes is a significant cause of blindness in adults, non-traumatic lower limb amputations and end-stage renal disease resulting in transplantation and dialysis (IDF, 2013). In the absence of a diabetes register, information on the prevalence of diabetes complications in Ireland is based on estimates from different regional and national studies (Tracey et al, 2016). In The Irish Longitudinal Study on Ageing (TILDA), among people aged 50 years and over with type 2 diabetes, 26% reported microvascular complications and 15% reported macrovascular complications (Tracey et al, 2015).

This means that as well as being an important public health issue. Type 2 diabetes is a huge financial burden to the Irish health service where diabetes care consumes up to 10% of the Irish healthcare budget.

It is against this backdrop that the Clinical Strategy and Programme Division in the HSE under the supervision of Dr Barry White and Dr Aine Carroll, set up a National Clinical Programme (NCP) for Diabetes. Its role is to

• examine how diabetes care is currently delivered to people with type 2 diabetes in Ireland; and
• to see how diabetes care could be changed to ensure that people with type 2 diabetes receive the highest standard of medical care possible
The working group of the National Clinical programme for Diabetes is comprised of representatives of all the health care professionals involved in the delivery of diabetes care. The group is particularly focused on the care delivered to people with type 2 diabetes.

See Appendix 1: Membership of the NCP – Diabetes Working group

How care is delivered to patients with Type 2 Diabetes at present
Currently in Ireland patients with Type 2 do not typically receive a structured programme of diabetes care. They receive their care either in
- primary care only: or,
- secondary care only: or
- some parts of the country the care is shared between primary and secondary care

This means that care can be disjointed and often ad hoc for people with diabetes. People with Type 2 diabetes are sometimes seen only once a year for their diabetes clinical review, or less frequently than the recommended 3 diabetes review visits per year.

There is frequent duplication of tests between primary and secondary care.

There is difficulty in accessing diabetes specialist opinion in secondary care because of the inappropriately low numbers of consultant endocrinologists and other members of the diabetes multidisciplinary team. This includes diabetes nurse specialists, dietitians and podiatrists. There is a lack of overall investment in diabetes care.

GP’s are reluctant to take on diabetes care in the community because of lack of resources in primary care and lack of access to members of the diabetes multidisciplinary team within the community.

The current situation has therefore led nationally to
- deficits in the delivery of care to people with Type 2 diabetes
- long hospital out-patient waiting lists
- difficulty accessing specialist secondary care opinion when required

The introduction of the Cycle of Care for Diabetes in October 2015 is the first step in the provision of reimbursement for structured diabetes care in general practice. To support the implementation of the Cycle of Care “A Practical Guide to Integrated Type 2 Diabetes Care” was updated by Dr Velma Harkins on behalf of the ICGP with the support of the National Clinical programme for Diabetes and launched in December 2015. This Model of Integrated Care for Patients with Type 2 Diabetes document now outlines the framework for the delivery of evidence based practice guidelines to people with Type 2 diabetes.

2. Proposed National Model of Integrated Care for Type 2 diabetes

The National Clinical Programme for Diabetes proposes to change how we deliver diabetes care to people with type 2 diabetes and support a National Model of Integrated Care. The integrated care will be developed with the joint involvement of primary, secondary and tertiary sectors.
The aim of the Model of Integrated Care is to:

- prevent or delay the onset of Type 2 diabetes
- improve the delivery of diabetes care to people with type 2 diabetes across all four levels of care i.e. specialist inpatient, specialist ambulatory care, specialist support to Primary Care and chronic disease prevention and management in Primary Care, all supported by patient self management.
- save the lives, eyes and limbs of people with diabetes
- ensure care is in line with the quality, access and cost objectives of the National Clinical Programme for Diabetes

**Quality**
The National Model of Integrated Care aims to reduce the proportion of diabetes related mortality by 10%.

It also aims to reduce diabetes related morbidity such as:

- blindness
- lower amputations
- cardiovascular and cerbrovascular events
- peripheral arterial disease

**Access**
Everyone with diabetes should be able to access a structured program of care locally which covers all aspects of their diabetes care.

**Cost**
The National Model of Integrated Care aims to reduce overall bed days by 25,000 per year and reduce the number of people with diabetes who develop diabetes related complications.

**The National Model of Integrated Care**
A register of people diagnosed with diabetes is essential given the limitations of self reported outcomes. This will allow a population based approach to be taken to planning and developing care to ensure effective interventions reach people who need them. In the absence of a diabetes register, information on the prevalence of diabetes complications in Ireland is based on estimates from different regional and national studies. In Ireland it is estimated that there are 209,000 people with diabetes (Tracey et al, 2016). It is estimated that approximately 33,000 of these people do not have Type 2 diabetes, but either Type 1 diabetes, or genetic or secondary causes of diabetes. This cohort of people have their diabetes related care managed in secondary or tertiary care only.

The remaining patients have Type 2 diabetes. A significant proportion of these patients (15-20%) remain undiagnosed but it is anticipated that the National Integrated Care Model will increase the numbers of people being diagnosed with Type 2 diabetes.
THE CARE PATHWAY

1. Disease Prevention
Healthy Ireland is our national framework for action to improve the health and wellbeing of the people of Ireland (http://health.gov.ie/healthy-ireland/). The onset of Type 2 diabetes can be prevented by lifestyle intervention and medication. See Chapter 2 for screening and prevention of type 2 diabetes.

2. Management in Primary Care
Uncomplicated Type 2 diabetes
Audit data from primary care practices, and from large teaching hospital diabetes databases in 2011, suggested that there were approximately 100,000 people with uncomplicated diabetes. We expect the prevalence of Type 2 diabetes is increasing in line with global trends, driven primarily by rising levels of obesity and an ageing population.

See Appendix 2: Uncomplicated Type 2 diabetes patients who will have their care managed in primary care only.

Their care will be managed in primary care only. They will be seen 3 times a year in primary care by the GP and/or practice nurse. The visits will be every 4 months with an annual review occurring every 12 months (ADA 2014, BMJ 2017).

People with Type 2 diabetes who currently attend secondary care and have uncomplicated diabetes as defined by the national model will be discharged to their general practitioners (GP) if they are participating in the National Model of Integrated Care for Type 2 diabetes.

3. Specialist support to Primary Care/Ambulatory Care
Complicated Type 2 diabetes
The remaining people who have complicated Type 2 diabetes or who develop complications of diabetes as defined by the National Model of Integrated Care will have their care shared between primary, secondary or tertiary care.

See Appendix 3: Complicated Type 2 diabetes patients who will be managed between both primary and secondary care

They will be seen at least once a year in secondary care for their annual review or more frequently according to the severity of the diabetes-related complications. They will also be seen up to twice a year combined three visits will ideally be at 4-monthly intervals (ADA 2014, BMJ 2017).

4. Specialist Care
People with diabetes who will be managed in secondary care only are defined in:
Appendix 4: People who will be managed in secondary care

The National Model of Integrated care will increase the space within diabetes specialist clinics to see these complex diabetes patients’ more frequently. The aim is that these people will be seen at 2 to 3 time per year in the secondary or tertiary care setting.

5. Self Management Support

All four levels of care are supported by self management. Self Management Support provides the education and supportive interventions to increase the person’s knowledge, skills and confidence in managing their diabetes. The patient-health professional relationship changes from the traditional approach to a partnership where the patient is an active participant in their care.

A key component in self management support for care of people with diabetes is Structured Patient Education (SPE). SPE is a planned and graded process that facilitates the knowledge, skills and ability for diabetes self-management. It empowers individuals to live healthily, to maintain and improve their quality of life and assume an active role in their diabetes care. Programmes should have a philosophy, curriculum, trained educators, be quality assured and regularly audited and evaluated. Currently in Ireland there are three programmes for people with type 2 diabetes that aspire to these standards: X-PERT, CODE – Community Orientated Diabetic Education and DESMOND – Diabetes Education and Self-Management for On-going and Newly Diagnosed diabetes.

The HIQA Health Technology Assessment of Chronic Disease Self-management Support Interventions published in December 2015 showed there is very good evidence that SPE, including culturally appropriate education, can improve blood glucose control in patients with Type 2 diabetes. This report also suggests that diabetes self management education programmes are cost-effective relative to usual care.

Regional variation occurs in the availability of courses, Patients and their families / carers can register for a structured diabetes education course online at http://www.hse.ie/eng/health/hl/living/diabetes/Diabetes_Courses/
Key aims for the management of patients with type 2 diabetes under the National Model of Integrated Care

The aim of the National Integrated Care Model is to improve the delivery of care to everyone with Type 2 diabetes across the country. As part of this, the National Clinical Programme for Diabetes have identified a number of key aims and objectives: They are as follows.

Primary care for uncomplicated diabetes
People with uncomplicated Type 2 diabetes should have their diabetes care provided by their GP.

Within two weeks of diagnosis
Within two weeks of diagnosis, everyone with newly diagnosed Type 2 diabetes should:
- be seen by their GP and practice nurse;
- receive Type 2 diabetes education (including exercise and dietary advice);
- receive an appropriate examination and investigations at their visit.

Within three months of diagnosis
Structured Education: Within three months of being newly diagnosed with Type 2 diabetes people should receive a structured type 2 diabetes education package. The package will give the patient appropriate dietetic input and advice regarding their clinical care. Patients not suitable for group education will receive a one to one consultation with a dietitian. Patients and their families/carers can register for a structured diabetes education course online at [http://www.hse.ie/eng/health/hi/living/diabetes/Diabetes_Courses/](http://www.hse.ie/eng/health/hi/living/diabetes/Diabetes_Courses/).

Retinal screening: Within two to three months of diagnosis, patients who have consented to be involved in the national retinopathy screening programme will receive retinal screening and regularly thereafter.

Four monthly visits
People once diagnosed with Type 2 diabetes will be seen at least every 4 months by their GP and/or practice nurse.

Annual review
People with Type 2 diabetes will have an annual review by their GP and/practice nurse.

Best practice
People with Type 2 diabetes will receive care as per best practice guidelines.

Glycated haemoglobin
Everyone with Type 2 diabetes should have their glycated haemoglobin checked at least 3 times per year. The target glycated haemoglobin (International Federation of Clinical Chemistry) (HbA1c/IFCC)) for most people with Type 2 diabetes will be ≤ 53mmol/l. Treatment targets and therapies used need to be individualised for the person with diabetes. For certain people with Type 2 diabetes the target glycated haemoglobin will need to be adjusted.

A GP who has a patient with Type 2 diabetes and a glycated haemoglobin of > 58mmol/mol on 2 or more glucose-lowering agents (not insulin) will seek advice about further treatment from the
Clinical Nurse Specialist (CNS) Diabetes Integrated Care. They will refer the patient to the consultant-led diabetes specialist team in the local secondary care centre.

**Blood pressure**
Everyone with Type 2 diabetes should have their blood pressure checked at least 3 times per year. The target blood pressure for most people with Type 2 diabetes will be ≤ 140/80mmHg. Treatment will be adjusted to achieve this target.

Treatment needs to be individualised and for certain people the target blood pressure will need to be adjusted.

**Lipid profile**
Everyone with Type 2 diabetes should have their lipid profile checked at least once a year. The majority of people with Type 2 diabetes will be treated with statin therapy to achieve an:
- LDL cholesterol of ≤ 2.5mmol/l in primary prevention; and
- LDL cholesterol of ≤ 1.8mmol/l in secondary prevention
- Treatment needs to be individualised and for certain people the target cholesterol will need to be adjusted

**Complicated Type 2 diabetes**
Everyone with complicated Type 2 diabetes, as defined by the National Model of Integrated Care, will be referred to the consultant-led diabetes specialist team in the local secondary or tertiary care centre for a specialist opinion.

**Obesity**
Everyone with Type 2 diabetes who is overweight or obese will be offered advice about weight reduction.

**Smoking**
Everyone with Type 2 diabetes who smokes will be offered advice about smoking cessation.

**Vaccines**
Everyone with Type 2 diabetes will be recommended and offered the annual flu vaccine by their GP. People with Type 2 diabetes will be recommended and offered the pneumococcal vaccine.

**Foot care**
Everyone with Type 2 diabetes should have a foot examination at each clinic visit. Their foot risk will be classified as:
- low
- moderate
- high
- active foot disease

If they have high or active foot disease they will be referred to the appropriate specialist centre as per the National Model of Care for the Diabetic Foot.
**Care audit**
All healthcare professionals involved in diabetes care will take part in an audit of their care on an annual basis. Audit data will be used to ensure quality of diabetes care.

**Diabetes register**
Ireland will have a national diabetes register. This register will be used to plan public policy on the delivery of diabetes care for the country.

**Clinical governance**
People with uncomplicated Type 2 diabetes will be under the governance of their GP.

People with complicated Type 2 diabetes will be under the governance of both their GP and consultant endocrinologist in the secondary or tertiary care centre. People with Type 1 diabetes or complex genetic or secondary causes of diabetes will have their diabetes-related care under the governance of the consultant-led diabetes multidisciplinary team in the secondary or tertiary care centre.

Clinical governance must adhere to the Guiding Principles for Quality and Safety developed by the Quality and Patient Safety Directorate of the HSE (www.hse.ie/go/clinicalgovernance; Quality and Patient Safety Directorate, Health Service Executive, 2012).

**3. Key deliverables of the National Model of Integrated Care**
The aim of the model is to improve the delivery of care to people with Type 2 diabetes in Ireland so that they improve control of:
- glucose;
- blood pressure
- lipids

The model also aims to manage their care and risk of developing diabetes-related complications in a structured integrated model of care with regular communication and seamless transition of care between both primary and secondary care.

Diabetes is currently the most common cause of (Waas JH, Shalet SM 2002):
- blindness of the working-aged adult;
- renal failure and dialysis requirement in the Western World; and
- lower-limb amputation and foot ulceration in the Western World

Diabetes is also a significant risk factor for:
- heart disease including heart failure
- stroke
- peripheral arterial disease
- the need for vascular interventions
Like a number of other chronic diseases, the complications of diabetes arise over time. Appropriate treatment interventions, which are proven to be both clinically effective and cost effective, take time to show their benefit. The National Model of Integrated Care will aim to reduce the incidence of diabetes-related complications and improve diabetes-related morbidity and mortality over the next 5 to 10 years.

**Earlier diagnosis**

Some 15-20% of patients with Type 2 diabetes are undiagnosed and this ‘delay’ in diagnosis puts patients at risk of developing the complications of diabetes (Tracey et al, 2016). The National Model of Integrated Care and the Chronic Disease Contract in General Practice will improve earlier diagnosis and recognition of the condition. It will:

- promote case finding by General Practitioners and early diagnosis
- allow treatment to be initiated earlier in the disease pathway
- prevent the development of diabetes-related complications

See Table 1: High-level performance metrics

**4. The role of the GP in delivering the National Model of Integrated Care**

The GP and the practice nurse are key to the success of the delivery of the National Model of Integrated Care. They are the primary care givers to their patients and they usually

- make the diagnosis of diabetes;
- are the first health professionals the patient sees on receiving their diagnosis
- are involved in the delivery of their diabetes and non-diabetes care over the lifetime of the patient

The National Model of Integrated Care asks:

- for uncomplicated Type 2 diabetes patients to be seen 3 times per year in the GP practice
- complicated Type 2 diabetes patients to be seen up to twice per year in primary care with at least one review per year in the secondary or tertiary specialist diabetes care centre

Therefore nationally there will be up to 420,000 diabetes-related visits to primary care per year.

**General practitioner**

The GP will carry overall responsibility, accountability and leadership in the running of integrated diabetes care in the practice. Responsibilities will include those outlined below.

**Staff knowledge**

The GP should make sure that the practice staff members have been familiarised with the national programme including:

- the agreed models of care;
- algorithms;
- patient information
- the national clinical guidelines
Roles and responsibilities
The GP should also ensure that all members of the team are aware of their roles and responsibilities in relation to delivery of the National Model of Integrated Care for Type 2 Diabetes.

National Model of Integrated Care
The GP will ensure that people with Type 2 diabetes are treated in accordance with The National Model of Integrated Care for Type 2 Diabetes.

The GP will agree to strive to achieve the national targets as set out by the national programme.

Governance
The GP will ensure that appropriate governance is in place to ensure continuing improvements, as laid out by the National Model of Integrated Care, in:
- quality
- access
- safety

Performance indicators
The GP will make sure that a process is in place for recording, monitoring and reporting on the agreed National Model of Integrated Care performance indicators. Key Performance Indicators (KPIs) are to be developed after a consultation period with relevant stakeholders.

Diabetes register and audit
The GP will maintain an up-to-date register of people with Type 2 diabetes and be actively engaged in on-going register maintenance. A practice-based diabetes register facilitates the provision of quality diabetes care through improved processes of care. To expedite and facilitate integrated care, information using a standard format should be shared between the primary care and allied secondary or tertiary care centres to enable sharing of information for the benefit of the patient. Such a register would also allow collection of data at local, regional or national levels to allow audit and planning for resource allocation.

New guidelines
The GP will be willing to adapt to new guidelines as they are developed.

Educational updates
It is desirable that the GP will attend regular educational updates.

Practice nurse
The role of the practice nurse is to provide nursing care to people with diabetes within general practice. The practice nurse works collaboratively with the GP and the multi-disciplinary care team.

Each nurse is responsible for their level of competency and must undertake relevant continuous professional development activities in order to develop and maintain the competence necessary for professional practice.

Role and responsibilities of the practice nurse in delivering integrated care;
The practice nurse will
- familiarise themselves with the National Integrated Model of Care and associated clinical practice guidelines for people with Type 2 diabetes
- provide regular routine care to people with diabetes as set out in the agreed model;
- consider the patients bio psycho social needs when planning care
- maintain the practice diabetes register
- carry out initial and subsequent foot assessments as per the national model
- set agreed targets with people with Type 2 diabetes
- liaise with patients families and carers where appropriate
- provide patient education re diet/lifestyle/exercise etc
- document care as per local GP policy on data protection and the NMBI(2015), “Recording Clinical Practice Professional Guidance document”
- return patient data as required
- where possible attend regular MDT and inter-disciplinary education updates
- liaise with the CNS Diabetes integrated care about specific patient concerns and diabetes management issues
- liaise with other members of the primary care team who are providing clinical care to the patient, for example the public health nurse

**Referrals**
The practice nurse will follow the national model of integrated care to refer patients to:
- the CNS diabetes integrated care where appropriate
- retinal screening;
- a structured diabetes education programme;
- a one-to-one consultation with a dietitian for those not suitable for group structured education programmes
- podiatry services as per the national model of foot care

For those who have complicated Type 2 diabetes the GP will refer them to secondary or tertiary care as outlined in the national model.

**GP criteria for entry into the National Model of Integrated Care**
- The GP should have adequate space in their practice to set up and deliver the programme.
- There should be a practice nurse (PN) available to deliver the National Diabetes Programme.
- The practice should be computerised
- The practice population should be large enough to justify providing care services for people with diabetes.
- A lead person for diabetes care should be identified at practice level.
- The GP will carry overall responsibility and leadership in the running of integrated diabetes care in the community (National Institute for Clinical Excellence 2002).
5. Secondary and tertiary care: their role in delivering the Integrated Model of Care

For the National Model of Integrated Care to work, the secondary and tertiary diabetes care services must be appropriately staffed so that they can provide the necessary resources for primary care in terms of:

• support
• advice
• guidance
• education

Secondary and tertiary care services must be able to continue the care of the high volume of people with both Type 1 diabetes and complicated Type 2 diabetes.

Diabetes is managed within the secondary care system by the diabetes multidisciplinary team. This team is led by a consultant endocrinologist and includes:

• advanced nurse practitioners
• diabetes nurse specialists
• dietitians
• podiatrists
• social workers and psychology support where available

This team works together to look after the care of people with diabetes.

Role of secondary care service

Type 1 diabetes
As defined by the national programme, the secondary care service will care for people who have:

• Type 1 diabetes
• genetic or secondary causes of diabetes
• complicated Type 2 diabetes

Rapid access
The secondary care service led by the Consultant Endocrinologist will provide rapid access for primary care so that people will be seen quickly if:

• they develop complicated Type 2 diabetes
• require an expert opinion

Primary care support
The secondary care service led by the Consultant Endocrinologist will support primary care in the management of everyone with complicated or uncomplicated diabetes.
Multidisciplinary team
The secondary care service led by the Consultant Endocrinologist will ensure that the members of the diabetes multidisciplinary team have been familiarised with the agreed National Model of Integrated care, including:

- algorithms
- patient information
- guidelines

The diabetes multidisciplinary team in the diabetes day centre will continue to deal with:

- diabetes-related emergencies
- diabetes-related complications
- diabetes education
- regular adjustment of insulin; management of hypoglycaemia
- foot care
- avoidance of admission to the hospital

Discharge from secondary care
The secondary care service will discharge people with uncomplicated Type 2 diabetes who are currently attending secondary care to primary care if the GP is participating in the National Model of Integrated Care, for their on-going diabetes management.

On discharge, the secondary care service will provide the GP and relevant members of the primary care team with a detailed discharge summary. This will include:

- the person’s medical and diabetes history;
- their current medication list; and
- treatment plan

They will also inform the GP of any change to treatment initiated in secondary care.

Primary care education
As the experts in the field of diabetes care, the Consultant Endocrinologist and the members of the diabetes multidisciplinary team in the secondary or tertiary care centre should be actively involved in their geographical area in the diabetes education of:

- local GPs;
- practice nurses;
- allied healthcare professionals; and
- public health nurses

This should include regular educational update sessions on diabetes-related topics.
**Care audit**
The secondary care service led by the Consultant Endocrinologist will ensure regular audit of practice within secondary care.

**Governance**
The secondary care service led by the Consultant Endocrinologist will ensure appropriate governance is in place to ensure continuing improvements in:
- quality
- safety
- access
- cost-effectiveness

**Performance indicators**
The secondary care service will make sure that processes are in place for recording, monitoring and reporting on the performance indicators as set out by the national programme. Key Performance Indicators (KPIs) are to be developed after a consultation period with relevant stakeholders.

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**6. The Role of Clinical Nurse Specialist in Diabetes Integrated Care**

The Clinical Nurse Specialist (CNSp) in Diabetes Integrated Care is the healthcare professional who will facilitate the successful integration of patient care between Primary and Secondary Care. They provide a primary care based specialist diabetes nursing service to individual patients referred to them by General Practitioners (GPs) and Practise Nurses (PNs). The CNS (Diabetes Integrated Care) will work 80% of the time in primary care and 20 % in secondary care providing a tangible link between primary and secondary care.

**Clinical Governance**
The CNSp Diabetes Integrated Care professional reporting and accountability is to the relevant Director of Public Health Nursing (DPHN) or Director of Nursing within the hospital if in place prior to 2015. The CNS (Diabetes Integrated Care) will have a clinical reporting relationship with GP in Primary Care and consultant endocrinologist in Secondary Care. The appropriate governance standards should be in place to allow the CNS to log into the GP electronic system.

**Role in Primary Care**
During the initial development stage where the practise is starting to structure diabetes care CNS (Diabetes Integrated Care) will provide information on establishing a register and a recall system. Initially the CNS (Diabetes Integrated Care) may do joint clinics with practice nurses /GPs with a view to building skills and confidence in the management of patients with uncomplicated Type 2 diabetes.

**Direct Care**
- The CNS(Diabetes Integrated Care) will review patients with complicated Type 2 Diabetes referred by GP/PN as per referral criteria
- Discuss individual patient case management issues with GP /PN
- Provide phone and email support to GP Practices
Indirect Care
- Provide best practice guidelines and assist with the development of policies in conjunction with their local Professional Development Co-ordinators for Practice Nursing and Nursing and Midwifery Planning and Development Unit
- Advise Health Care Professionals on structured education programmes and foot screening programmes available in their area along with referral pathways and local resources
- Provide educational booklets and advise on where to source supplies
- Support and engage with local diabetes prevention programmes

Education and Training
- Provide education and training for health care professionals
- Provide information on available education in diabetes modules for health care professionals
- In conjunction with Diabetes Implementation Groups (DSIG) provide annual multidisciplinary diabetes master classes/ conferences
- Participate in Structured Patient Education Programmes for people with diabetes

Audit and Research
- Assist and support audit of diabetes care and provide feedback within practices to influence the delivery of integrated care
- Collect data aligned to National KPIs and maintain a record as directed by National Clinical Programme

Advocate
- Advocate for improvement in access to services for patients with Diabetes.

Role in Secondary Care
- Work as part of Multidisciplinary Team
- Provide nursing care to adults with type 1 and type 2 diabetes to ensure clinical skills are maintained in the management of patients not reviewed in primary care clinics
- Undertake case management review with Consultant Endocrinologist and MDT for patients seen in primary care
- Assist with the development of integrated care pathways with hospital and primary care teams
- Attend hospital based diabetes MDT meetings, case conferences and journal clubs

One integrated care diabetes nurse specialist will cover approximately 75,000 of the population.

7. The role of the community dietitian in the National Model of Integrated Care

The community dietitian will carry out one-to-one dietetic and group interventions in primary care. They will support the integrated care pathway, by providing individualised dietetic assessment and intervention tailored to the patient’s needs.
Collaboration between the community dietitian and the patient in developing a common agenda for change is crucial to allow realistic and specific goal setting.

**Patient education**
The community dietitian will deliver patient education via a structured education-based group programme, which aims to empower participants to develop self-management skills. The programme should include education on:
- diet
- weight management
- alcohol
- smoking
- physical activity
- medication; and
- other lifestyle factors

**Multidisciplinary team**
Community dietitians will be involved in the multidisciplinary primary care team approach, which allows collaboration and discussion between all members of the primary care team. This may be in the form of regular clinical meetings or by other correspondence.

**Secondary care**
Community dietitians will be involved in regular liaison with the acute dietetic and secondary care diabetes services to support the National Model of Integrated Care.

**Health promotion**
Community dietitians will support nutrition health promotion initiatives and education to health professionals.

**On-going training**
Community dietitians will provide on-going continuous professional development by training health professionals and patients. They will also develop resources including:
- local guidelines;
- care pathway;
- service delivery guidelines; and
- patient information leaflets

**Audits and evaluation**
Community dietitians are committed to on-going audit and evaluation as part of care provision in both the one-to-one and group setting to assess and maintain high standards of patient care.
8. The role of the community podiatrist

The role of the community podiatrist in the integrated care pathway is to deliver foot care as per the National Model of Care for the Diabetic Foot. They will also train healthcare professionals to identify patients’ feet as:

- being low risk;
- being moderate risk;
- being high risk or
- having active foot disease;

Community podiatrists will see people with moderate risk diabetic foot disease at least once per year as per the National Model of Care for the Diabetic Foot. They will refer people with high risk and active diabetic foot disease to the specialist secondary care services. In certain circumstances the community podiatrist may continue to see high risk and active foot disease within the community, but only in the setting of close collaboration and under the clinical supervision of the consultant-led diabetes service in the local secondary or tertiary care centre.

Liaison
Community podiatrists will liaise closely with the foot protection teams and specialist foot services in Secondary care centre’s.

In primary care, they will support practice nurses in identifying, examining and managing the diabetic foot.

Audit and evaluation
Community podiatrists are committed to on-going audit and evaluation of their service as part of care provision.

9. The role of the community pharmacist

The community pharmacist plays a role in the delivery of the National Model of Integrated Care. They can

- advise and support patients in their medication management
- advise the GP of any issues with the patient’s current medicine
- conduct medication usage reviews for patients referred by the GP
- advise people on the use of blood glucose monitors
- reinforce the key messages delivered by the relevant healthcare professionals on patient diabetes self-care

Audit and evaluation
Community pharmacists are committed to on-going audit, evaluation of their service, and continuous professional development.
10. Ensuring integration and the continuous improvement in care being delivered to people with Type 2 diabetes

The aim of the National Diabetes Programme is to improve the quality of diabetes care delivered to people with Type 2 diabetes across the country. As an integral part of any clinical service it is recommended that general practice involved in delivering diabetes care should participate in audit.

**What is an audit?**
Audit involves systematically:
- looking at the procedures used for diagnosis, care and treatment;
- examining how associated resources are used; and
- investigating the effect care has on the outcome and quality of life for the patient (Harkins 2008)

**Why is an audit important for this diabetes model of care?**
The national programme has highlighted the need for auditing the service being delivered by all healthcare professionals involved in the care of people with Type 2 diabetes. Audit helps to improve the quality of the service being offered to patients. Without some form of audit, it is very difficult to know whether or not you are practicing effectively; and even more difficult to demonstrate this to others.

The benefits of an audit are that it identifies and promotes good practice and can lead to improvements in service delivery and outcomes for users/patients. An audit can also:
- provide the information you need to show others that your service is effective (and cost-effective); and
- help to ensure better use of resources and, therefore, increased efficiency

The main aim of auditing the service is to improve outcomes for everyone with Type 2 diabetes by improving professional practice and the general quality of services delivered.

**Putting an audit in place in your practice**
The National Model of Integrated Care and the ICGP A Practical Guide to Integrated Type 2 Diabetes Care have developed a number of treatment algorithms to support healthcare professionals to deliver key elements of the diabetes service. This will mean there is a standardised approach to service delivery nationally.

Each treatment algorithm contains suggestions about how the procedure may be audited. It is advisable that each procedure is audited at least once in a two-year cycle. The practice will allow the physician to identify the sequence of auditing key procedures in the practice.

This sequence should be developed so that it determines the significance of each procedure in terms of the impact on the patient’s care. It is important to make sure that the ones with the most significant impact are audited first and possibly more frequently than others.

A procedure that is used very often may need to be audited more frequently, than a procedure that may be used only once a year.
Once the practice has determined its own audit cycle, it is important to assign responsibility for ensuring that these audits occur to one of the practice members. Ideally, that person should have knowledge of auditing, and be given authority within the practice to follow through with audits and outcomes of audits.

It is useful to keep the results of audits in a central location, and use them for learning within the practice, and for sharing across other practices when the opportunity presents itself.

11. The Irish ‘core dataset’ for primary and secondary or tertiary care

The ‘core dataset’ will be the key communication tool between primary and secondary or tertiary care to ensure the success of the National Model of Integrated Care for Type 2 diabetes. It has evolved from the Scottish Diabetes Core dataset (NHS Scotland 2003). The core dataset is essentially the patient demographic and clinical information to be shared between primary and secondary care.

See Appendix 5: The core dataset

On entry into the National Model of Integrated Care, people with Type 2 diabetes will give their consent to be registered into the programme. They will also give permission for their clinical data to be shared between primary and secondary care.

Patient demographic and clinical data will be recorded at the first visit. At each visit thereafter, either in primary or secondary care, the clinical dataset and other information will be shared between primary and secondary care where appropriate.

12. Governance

General governance principles

Clinical governance is about people receiving the right care, at the right time, from the right person in a safe, honest, open and caring environment. Effective governance arrangements recognise the inter-dependencies between corporate, financial and clinical governance across the service. It integrates these to deliver high quality, safe and reliable healthcare.

Healthcare organisations are responsible and accountable for delivering safe, high quality, cost-effective care that achieves the best possible health outcomes for people in Ireland. Emphasis is placed on quality and patient safety. This includes developing an infrastructure for integrated quality, safety and risk management with the aim of achieving excellence in clinical governance. Formalised governance arrangements ensure that everyone working in the health and personal social services are aware of their responsibilities, authority and accountability and work towards achieving improved patient outcomes. Clear accountability arrangements are a fundamental building block of good clinical governance. They bring clarity to the authorities and responsibilities of individuals, teams and committees (or groups).

One of the key principles of good governance is that there are clear lines of authority and accountability at individual, team and whole system levels. There should be a clear hierarchy of single-point accountability within a managerial hierarchy.
The National Clinical Programme for Diabetes has embedded these principles by adopting a leadership and accountability framework that envisages every clinician and administrator working in the programme having clear roles and responsibilities. The National Clinical Programme for Diabetes adheres to the Guiding Principles for Quality and Safety developed by the Quality and Safety Directorate of the HSE (www.hse.ie/go/clinicalgovernance; Quality and Patient Safety Directorate, Health Service Executive, 2012).

Patient, clinician, GP and healthcare professional feedback on their experience of reviewing or providing services should form a key component of the National Model of Integrated Care. Regular and effective communication between all members of the primary care team and the hospital-based diabetes multidisciplinary team is central to the success of the National Model of Integrated Care.

The National Model of Integrated Care embraces:

- clinical effectiveness
- integrated pathways
- clinical audit
- risk management
- research and development
- organisational development
- clinical indicators

13. Overall aim of National Model of Integrated Care

The aim of the National Integrated Model of Care is to deliver a new model of clinical care, to change current practice and to improve the delivery of diabetes care to people with Type 2 diabetes in this country. To improve diabetes-related outcomes in our patients, the model promotes:

- prevention
- early detection
- integration
- improved communication between primary and secondary care
- working together

This will translate to:

- better patient outcomes
- less diabetes-related complications
- improved quality of care
- improved patient satisfaction
- improved access to high quality care
- cost-effective delivery of high quality care
Chapter 1: Tables and appendices

Table 1: High-level performance metrics

Appendix 1: Membership of the National Diabetes Working Group

Appendix 2: Patients with Uncomplicated Type 2 Diabetes who will have their care managed in primary Care only

Appendix 3: Complicated Type 2 diabetes patients who will be managed between both primary and secondary care

Appendix 4: People with diabetes to be managed in secondary care

Appendix 5: The core dataset
<table>
<thead>
<tr>
<th>Type of benefit</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in diabetes-related mortality</td>
<td>The programme will aim to reduce diabetes related mortality by 10% over 5 to 10 years</td>
</tr>
<tr>
<td>Percentage reduction in all cause mortality in diabetes</td>
<td>The programme will aim to reduce this by 10% over 5 to 10 years</td>
</tr>
<tr>
<td>Percentage reduction in myocardial infarction in patients with diabetes</td>
<td>20% reduction in the next 5 to 10 years</td>
</tr>
<tr>
<td>Percentage reduction in stroke in patients with diabetes</td>
<td>20% reduction in the next 5 to 10 years</td>
</tr>
<tr>
<td>Percent of identified patients with diabetes receiving an annual foot exam</td>
<td>90% by end of year 5</td>
</tr>
<tr>
<td>Percentage Reduction in new cases of diabetes related foot ulcers</td>
<td>40% reduction in the next 5 years</td>
</tr>
<tr>
<td>Percentage reduction in lower limb amputations</td>
<td>40% reduction in the next 5 years</td>
</tr>
<tr>
<td>Percentage reduction in annual incidence of new blindness</td>
<td>40% reduction in the next 5 years</td>
</tr>
<tr>
<td>Percentage reduction in cases requiring vitrectomy and photocoagulation therapy</td>
<td>40% reduction in the next 5 years</td>
</tr>
<tr>
<td>Percent of patients with diabetes invited for retinopathy screening</td>
<td>90% by end of year 5</td>
</tr>
<tr>
<td>Percent of patients with diabetes screened annually for early sign of diabetic kidney disease</td>
<td>90% by end of year 5</td>
</tr>
<tr>
<td>Earlier diagnosis of previously unrecognised cases of type 2 diabetes</td>
<td>Screening of high risk individuals in primary care will develop over 3 to 5 years</td>
</tr>
</tbody>
</table>
Appendix 1

Membership of the National Clinical Programme Diabetes Working Group 2012/2013

Dr Diarmuid Smith – National Clinical Lead for Diabetes
Dr Velma Harkins – National Clinical Co-Lead for Integrated Care
Mairead Gleeson – National Diabetes Programme Manager
Dr Orlaith O’Reilly – Public Health Lead
Dr James Gibney - Regional Lead for HSE Dublin Mid Leinster
Dr John McDermott – Regional Lead for HSE Dublin North East
Dr Diarmuid Quinlan – Regional Lead for HSE South
Dr Francis Finucane – Regional Lead for HSE West
Dr Sean Dinneen – Consultant Endocrinologist, UCHG
Denise Blanchfield – Advanced Nurse Practitioner
Margaret Humphreys – Senior Dietitian
Carmel Devine – National Podiatry Lead
Anna Clarke – Diabetes Federation of Ireland representative
Trevor Hunter – HSE Corporate Pharmacy
Noel Stenson - Independent Community Pharmacy Liaison

Previous members included:

Professor Richard Firth Consultant Endocrinologist
Dr Cathy McHugh Consultant Endocrinologist
Mairead Mannion (Diabetes Nurse Specialist)
Pat Keenan (Diabetes Nurse Specialist)
Laura Kelly (Podiatrist)
Declan Campbell (Podiatrist)
Gemma Leane (Public Health Researcher)
Membership of the National Clinical Programme for Diabetes Working Group 2015/2016

Dr Ronan Canavan - National Clinical Lead for Diabetes
Prof Sean Dinneen – National Clinical Lead for Diabetes from June 2016
Niamh Smyth - Programme Manager
Dr Mensud Hatunic - Regional Lead for HSE Dublin North East
Dr. Diarmuid Quinlan - Regional Lead for HSE South
Dr. Shu Hoashi - Regional Lead for HSE Dublin Mid Leinster
Trevor Hunter – Community Pharmacist
Adrienne Lynam - National Project Manager-Obesity, Health Promotion & Improvement
Dr. Francis Finucane – Regional Lead for HSE West
Dr Anna Clarke - Diabetes Ireland Representative
Helen Twamley – Nursing Lead
Caroline McCusker - Podiatry Lead
Eilis Kearney – Hospital Pharmacist
Margaret Humphreys – Dietetic Lead/National Co-ordinator for Structured Patient Education
Prof Patricia Kearney - Research Professor Department of Epidemiology and Public Health UCC
Marie Courtney - Professional Development Co-ordinator for Practice Nurses
## Appendix 2: Patients with Uncomplicated Type 2 diabetes who will have their care managed in primary care only

Uncomplicated Type 2 diabetes is defined as people with the condition who meet the following criteria;
- they are not on insulin
- their diabetes is managed by lifestyle modifications only or
- they are on 2 glucose lowering agents with IFCC/HBA1c (< 58mmol/l or <7.5%)

And they have
- Low or moderate risk diabetic foot
- No active diabetic eye disease
- Controlled CV risk factors
- Normal hypoglycaemia awareness

And they have
- Satisfactory renal function defined as
  - A serum creatinine < 150umol/L or
  - eGFR > 60ml/min or
  - Albuminuria < 30mmol/ml or
  - PCR < 100mg/mmol

And they have
- No symptoms of autonomic neuropathy (with exception of erectile dysfunction)
## Appendix 3

### Appendix 3: Complicated Type 2 diabetes patients who will be managed between both primary and secondary care

The patients who will have this model of integrated care include those who have any of the following:

- **A need for or require insulin.***
- Failing IFCC / HbA1c (>58mmol/l or 7.5%) and are on 2 or more glucose lowering agents (not insulin).
- **Active foot disease – as per National Model of Care for the Diabetic Foot.**
- A high risk foot – as per National Model of Care for the Diabetic Foot.
- Renal failure – creatinine > 150umol/l or eGFR < 60ml/min.
- Albuminuria with normal serum creatinine – ACR on 2 occasions > 30mmol /ml or PCR > 100mg/mmol.
- Painful peripheral neuritis.
- Symptoms of autonomic neuropathy (except for erectile dysfunction).
- Diabetic eye disease with active proliferative retinopathy / maculopathy or recent laser therapy or intra-vitreal injections (within the last 24 months).
- Uncontrolled CV risk factors (refractory hypertension or dyslipidaemia).
- Steroid – induced hyperglycaemia (can be referred back once off steroids or blood glucose levels settle).
- Recurrent hypoglycaemia.
- Impaired Awareness of Hypoglycaemia
- Weight loss + osmotic symptoms + / - ketones

*People with Type 2 diabetes on insulin may be managed appropriately in the community depending on local primary care expertise or availability of an integrated care diabetes nurse specialist.*
## Appendix 4

### Appendix 4: People with diabetes to be managed in secondary care

The following people are to have their diabetes related care managed in secondary care:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who have Type 1 diabetes</td>
<td></td>
</tr>
<tr>
<td>With Type 1 or Type 2 diabetes and are planning a pregnancy or who are pregnant</td>
<td></td>
</tr>
<tr>
<td>With diabetes who are on continuous subcutaneous insulin infusion (CSII) therapy</td>
<td></td>
</tr>
<tr>
<td>With paediatric or adolescent diabetes</td>
<td></td>
</tr>
<tr>
<td>With MODY (maturity onset diabetes of the young)</td>
<td></td>
</tr>
<tr>
<td>Who have cystic fibrosis related diabetes</td>
<td></td>
</tr>
<tr>
<td>Who have secondary causes of diabetes for example</td>
<td></td>
</tr>
<tr>
<td>- Diabetes due to endocrinopathies</td>
<td></td>
</tr>
<tr>
<td>- Pancreatitis</td>
<td></td>
</tr>
<tr>
<td>- Post- pancreatic surgery</td>
<td></td>
</tr>
<tr>
<td>Who are post transplant diabetes</td>
<td></td>
</tr>
<tr>
<td>With genetic causes of diabetes for example</td>
<td></td>
</tr>
<tr>
<td>- Tumors</td>
<td></td>
</tr>
<tr>
<td>- Klinefelters</td>
<td></td>
</tr>
<tr>
<td>- Syndromes of insulin resistance etc.</td>
<td></td>
</tr>
<tr>
<td>With diabetes as adults &lt; 30 years of age</td>
<td></td>
</tr>
<tr>
<td>Who have complicated Type 2 diabetes (see Appendix 3)</td>
<td></td>
</tr>
<tr>
<td>Who have Type 2 diabetes with insulin*</td>
<td></td>
</tr>
</tbody>
</table>

*People with Type 2 diabetes on insulin may be managed appropriately in the community depending on local primary care expertise or availability of an integrated care diabetes nurse specialist*

The National Model of Integrated care will facilitate the specialist clinics to see these complex patients with diabetes more frequently. The aim is that these people will be seen at least 2 to 3 times per year in the secondary or tertiary care setting.
## Appendix 5

### Appendix 5: The Core Dataset

The following information should be provided on each patient with Type 2 diabetes who is signed up for the National Integrated Care Diabetes programme within the GP practice.

#### Demographic data
- Medical staff
- GP practice name
- GP practice address
- GP address
- GP surname
- GP first name
- GP Medical Council number
- Hospital name
- Hospital specialty
- Consultant / healthcare practitioner
- Consultant Medical Council number

#### Patient
- ICDS diabetes ID
- Surname
- First forename
- Second forename
- DOB (dd/mm/yyyy)
- Address
- Phone day
- Phone evening
- Mobile phone
- Next to kin
- Phone number of next to kin
- Gender (as identified by patient)
<table>
<thead>
<tr>
<th>Ethnic grouping (2011 census)</th>
<th>White Irish</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>White Irish Traveller</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any other White background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black or Black Irish - African</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black or Black Irish – or other Black background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian or Asian Irish - Chinese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian or Asian Irish – any other Asian background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other, including mixed background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None stated</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Medical Card number of patient

**Diabetes History**

- Date of diabetes diagnosis: (dd/mm/yyyy)
- Type 1
- Type 2
- Gestational
- MODY
- Haemochromatosis
- Pre-diabetes
- Other

**Family history of diabetes**

- First degree relative with diabetes.

**Diabetes care type**

1. Primary care only
2. Diabetes care by hospital only
3. Diabetes care between hospital and primary care
### Appendix 5 continued: The Core Dataset

**RIP message**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of death</td>
<td>dd/mm/yyyy</td>
</tr>
<tr>
<td>Cause of death</td>
<td>ICD10</td>
</tr>
</tbody>
</table>

**Underlying cause of death**

1. Directly due to diabetes
2. Indirectly / possibly related to diabetes
3. Not related to diabetes

**History General**

- Reason for Referral
- Previous attendance at this hospital
- History of presenting complaint
- Past medical history
- Past surgical history
- Relevant family history
- Allergies / adverse reactions to medications

**Social History**

- Smoking
- History of tobacco use
- Years smoking
- Cigarettes smoked per day
- Alcohol
- History of alcohol use
- Units of alcohol per week

**General Data**

- Weight
- Height
- BMA
- Waist circumstance
### Appendix 5 continued: The Core Dataset

#### Diabetes Data

<table>
<thead>
<tr>
<th></th>
<th>Present</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetic review on this date</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IFCC/HbA1c</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration left hallux</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration right hallux</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monofilament left foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monofilament right foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dorsalis pedis right foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dorsalis pedis left foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posterior tibial left foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posterior tibial right foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health of left foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health of right foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot risk status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low risk</td>
<td></td>
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<tr>
<td></td>
<td>Moderate risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Active foot disease</td>
<td></td>
</tr>
<tr>
<td>Creatinine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDL</td>
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<tr>
<td>Triglycerides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EGFR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>dd/mm/yyyy</td>
<td></td>
</tr>
<tr>
<td><strong>Appendix 5 continued: The Core Dataset</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>MI</td>
<td></td>
<td></td>
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<tr>
<td>Hypertension</td>
<td></td>
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<tr>
<td>CABG</td>
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<tr>
<td>PCI</td>
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<tr>
<td>Angina</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes – related foot ulcer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes – related amputation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peripheral neuropathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dialysis for renal failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retinopathy</td>
<td>dd/mm/yyyy</td>
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</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Background Diabetic Retinopathy</td>
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<td></td>
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<tr>
<td>Pre-proliferative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proliferative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maculopathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blind</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cataract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intra-vitreal injections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile dysfunction</td>
<td>dd/mm/yyyy</td>
<td></td>
</tr>
<tr>
<td>Severe hypoglycaemia</td>
<td>dd/mm/yyyy</td>
<td></td>
</tr>
<tr>
<td>Impaired Awareness of hypoglycaemia</td>
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</tbody>
</table>
### Appendix 5 continued: The Core Dataset

<table>
<thead>
<tr>
<th>Current Medications</th>
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</thead>
<tbody>
<tr>
<td>Referral to defined healthcare professional</td>
<td>dd/mm/yyyy</td>
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<tr>
<td>GP</td>
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</tr>
<tr>
<td>Diabetologist</td>
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</tr>
<tr>
<td>Dietitian</td>
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</tr>
<tr>
<td>Diabetes nurse specialist</td>
<td></td>
</tr>
<tr>
<td>Practice Nurse</td>
<td></td>
</tr>
<tr>
<td>Podiatrist</td>
<td></td>
</tr>
<tr>
<td>Ophthalmologist</td>
<td></td>
</tr>
<tr>
<td>Retinal screening programme</td>
<td></td>
</tr>
<tr>
<td>Psychologist</td>
<td></td>
</tr>
<tr>
<td>Structured education programme</td>
<td></td>
</tr>
<tr>
<td>Seen by defined healthcare professional in the past 12 months</td>
<td>dd/mm/yyyy</td>
</tr>
<tr>
<td>GP</td>
<td></td>
</tr>
<tr>
<td>Diabetologist</td>
<td></td>
</tr>
<tr>
<td>Dietitian</td>
<td></td>
</tr>
<tr>
<td>Diabetes nurse specialist</td>
<td></td>
</tr>
<tr>
<td>Practice nurse</td>
<td></td>
</tr>
<tr>
<td>Podiatrist</td>
<td></td>
</tr>
<tr>
<td>Ophthalmologist</td>
<td></td>
</tr>
<tr>
<td>Retinal screening programme</td>
<td></td>
</tr>
<tr>
<td>Psychologist</td>
<td></td>
</tr>
<tr>
<td>Structured education programme</td>
<td>dd/mm/yyyy</td>
</tr>
<tr>
<td>Appendix 5 continued: The Core Dataset</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Diabetes management plan</td>
<td>dd/mm/yyyy</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pregnancy</strong></td>
<td>dd/mm/yyyy</td>
</tr>
<tr>
<td>Are you planning a pregnancy?</td>
<td>Yes ☐</td>
</tr>
<tr>
<td>Pre-pregnancy advice given?</td>
<td>Yes ☐</td>
</tr>
<tr>
<td>Has patient been referred to pre-pregnancy clinic?</td>
<td>Yes ☐</td>
</tr>
</tbody>
</table>
Chapter 2
Screening and Prevention of Type 2 diabetes

Type 2 diabetes is frequently not diagnosed until complications appear, approximately 15-20% of patients with Type 2 diabetes are undiagnosed and this ‘delay’ in diagnosis puts patients at risk of developing the complications of diabetes (Tracey et al, 2016).

Early identification of patients and initiation of treatment can reduce the development of complications of diabetes. Therefore screening for diabetes in asymptomatic patients with risk factors associated with the development of diabetes is recommended (American Diabetes Association, Clinical Practice Recommendations 2016).

See Table 2: Criteria for screening for diabetes in asymptomatic adult individuals

Type 2 diabetes is associated with a pre-diabetes phase, which encompasses both impaired fasting glucose (IFG) and impaired glucose tolerance (IGT).

Both IFG and IGT are associated with an increased risk of developing diabetes and cardiovascular disease. IFG is defined:
- by the World Health Organisation (WHO 2011) as a fasting plasma glucose of ≥ 6.1mmol/l; and
- the American Diabetes Association (American Diabetes Association, Clinical Practice Recommendations 2016) as a fasting plasma glucose ≥ 5.6mmol/l

IGT is defined by both the WHO and ADA as the 2-hour plasma glucose on an oral glucose tolerance test of 7.8-11.0mmol/l.

To screen for pre-diabetes, fasting plasma glucose, 2-h plasma glucose after 75-g oral glucose tolerance test and A1C are equally appropriate (American Diabetes Association, Clinical Practice Recommendations 2016).

Studies have shown that patients with IFG or IGT, or both, can significantly reduce their risk of developing Type 2 diabetes by following intensive lifestyle modification programmes (Lindstrom et al 2003).

Medications, including metformin (New England Journal of Medicine 2002), have also been shown to reduce the risk of diabetes in people with pre-diabetes.

People with either IFG or IGT, or both, should be given advice on how to follow a healthy lifestyle, advice re:
- diet;
- physical activity;
• smoking cessation;
• alcohol intake; and
• managing other cardiovascular risk factors such as,
  o hypertension, and
  o dyslipidaemia

Information leaflets on diet, nutrition and exercise should be given to people with either IFG or IGT.

**Screening for diabetes in Irish Travellers**

There are approximately 40,000 Travellers living in the island of Ireland. Travellers have a 3 to 4 time’s higher mortality rate than the general population. Cardiovascular disease is the leading cause of death for Travellers (All Ireland Traveller Health Study Team, 2010).

Travellers are at high risk of Type 2 diabetes and at being diagnosed at a younger age than the general population. It is estimated that 49% of Travellers are obese with a further 30% overweight and 40% showing features of the metabolic syndrome.

Screening for diabetes in this cohort is therefore extremely important. If diagnosed with Type 2 diabetes people in this cohort should be educated on the benefits of:
• a healthy lifestyle
• diet
• weight loss if appropriate
• increased physical activity
• smoking cessation
• reduced alcohol intake
• compliance with medication
• the importance of regular follow up
### Chapter 2: Tables

#### Table 2: Criteria for screening for diabetes in asymptomatic adult individuals

**Testing should be considered in all adults who are overweight (BMI >25kg/m²) and who have one or more additional risk factors:**

- Physical inactivity
- First degree relative with diabetes
- Members of the travelling community
- High risk ethnicity (African, Asian, Hispanic)
- History of gestational diabetes
- Delivery of baby >4kg
- Women with polycystic ovarian syndrome
- Hypertension
- Dyslipidemia
- A1c > 39mmol/L or history of impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) on previous testing
- Other clinical conditions associated with insulin resistance (e.g. severe obesity, acanthosis nigricans)
- History of cardiovascular disease

For all patients, testing should begin at age 45 years

If results are normal, testing should be repeated at least at 3-year interval. Patients with IFG or IGT should be tested annually

*For details on tests to diagnose diabetes, see Chapter 3: Diagnosis of Type 2 diabetes*
Chapter 3

Diagnosis of Diabetes

The onset of Type 2 diabetes is subtle and people are often asymptomatic (Waas JH, Shalet SM 2002). Early detection requires clinical suspicion combined with systematic and opportunistic case-finding, as diagnosis is frequently delayed until diabetes-related complications appear (Waas JH, Shalet SM 2002). To aid screening and early detection of diabetes the IFCC/HbA1c can now also be used to diagnose diabetes (WHO 2011).

If the person is diagnosed with diabetes in primary care, the communication of diagnosis is the responsibility of the GP. For people diagnosed in secondary care, the communication of diagnosis of diabetes is the responsibility of the hospital doctor with appropriate referral to the GP as per the National Model of Integrated Care.

See Appendix 6: Algorithm for initial diagnosis of a patient with Type 2 diabetes

Auditing suggestions
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to people with Type 2 diabetes are to:

- measure how frequently the IFCC (HbA1c) was used to make a diagnosis of diabetes;
- check that the GP practice receives appropriate referral information for all patients newly diagnosed with Type 2 diabetes in secondary care;
- check if the person was entered in the National Diabetes Register.
### Chapter 3: Tables and Appendices

#### Table 3: Diagnosing diabetes

Diabetes is diagnosed using one of the following criteria (WHO 2011, American Diabetes Association, Clinical Practice Recommendations 2016)

<table>
<thead>
<tr>
<th>Condition</th>
<th>IFCC/HbA1c Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting plasma glucose $\geq 7.0\text{mmol/l}$ (fasting is defined as no caloric intake for at least 8 hours)*</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Patients with classic osmotic symptoms of hyperglycemia and a random plasma glucose of $\geq 11.1\text{mmol/l}$ (random defined as any time irrespective of last meal)</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Two-hour plasma glucose $\geq 11.1\text{mmol/l}$ during a 75gm oral glucose tolerance test</td>
<td></td>
</tr>
<tr>
<td>* In the absence of unequivocal hyperglycaemia, the results should be confirmed by repeat testing IFCC/HbA1c value of $&lt;48\text{mmol/l}(&lt;6.5%)$ does not exclude diabetes diagnosed using the other glucose tests</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 6: Algorithm for initial diagnosis of a patient with Type 2 diabetes

1. Patient identified in GP practice
2. Person identified in secondary care
3. Abnormal results communicated to the patient’s GP
4. Physician in secondary care advises the patient of their diagnosis and advises them to attend their GP as per National Model of Integrated Care
5. Refer patients with uncomplicated Type 2 diabetes to primary care
6. Complicated Type 2 diabetes patient’s care is shared between primary and secondary care
7. Patient may stay in secondary care depending on their classification of diabetes
8. Diagnosis of Type 2 diabetes made and patient advised of diagnosis by GP
9. Advise patient to sign up for long term illness care, retinal screening and structured education and to join diabetes support organisation
10. Ask for consent from patient to register them on GP and National Diabetes Register
11. Practice nurse makes contact with patient and makes an appointment to see them first
Appendix 7

Appendix 7: The 75gm oral glucose tolerance test (OGTT)

The oral glucose tolerance test should be done:
- In the morning after an overnight fast of 8-14 hours
- After at least 3 days of unrestricted diet (>150gm carbohydrate per day)
- Unlimited physical activity

The person should remain seated and should not smoke during the test. Blood should be drawn at time 0 minutes and at 2 hours.

For the 75gm of oral glucose it is recommended to use;

113mls of Polycal (available on GMS) made up to 200ml with water (for taste). 100mls of water should be given 5 minutes after the original mixture is consumed to aid absorption of the glucose load. Alternatively 75gms of glucose dissolved in 300mls of water can be drunk over 5 minutes.

<table>
<thead>
<tr>
<th>Interpretation of OGTT results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The diagnosis is diabetes if:</strong></td>
</tr>
<tr>
<td>Fasting plasma glucose ≥ 7.0mmol/l</td>
</tr>
<tr>
<td>and/or</td>
</tr>
<tr>
<td>2 hour plasma glucose ≥ 11.1mmol/l</td>
</tr>
<tr>
<td><strong>The diagnosis is Impaired Fasting Glucose (IFG) if:</strong></td>
</tr>
<tr>
<td>Fasting plasma glucose is between 6.1 and 6.9mmol/l according to the WHO (WHO 2011)</td>
</tr>
<tr>
<td>or</td>
</tr>
<tr>
<td>Between 5.6 and 6.9mmol/l according to the American Diabetes Association (American Diabetes Association, Clinical practice Recommendations, 2016)</td>
</tr>
<tr>
<td>and</td>
</tr>
<tr>
<td>2 hour plasma glucose is ≤ 7.8mmol/l</td>
</tr>
<tr>
<td><strong>The diagnosis is Impaired Glucose Tolerance (IFG) if:</strong></td>
</tr>
<tr>
<td>Fasting plasma glucose is any reading &lt; 7.0mmol/l</td>
</tr>
<tr>
<td>but</td>
</tr>
<tr>
<td>2 hour plasma glucose is between 7.8 and 11mmol/L</td>
</tr>
</tbody>
</table>
### Appendix 8: Conditions that will interfere with IFCC/HbA1c

There are some conditions that may interfere with the IFCC/HbA1c assay and exclude its use as a test to diagnosis diabetes. For these conditions use plasma glucose criteria instead to diagnosis diabetes. The conditions are:

- Haemoglobinopathies
- Sickle cell disease
- Haemolytic anaemia
- Recent blood transfusion
- Recent blood loss
- Iron deficiency anaemia
Chapter 4

Targets for Type 2 Diabetes

Glycated haemoglobin IFCC(HbA1c)
An HbA1c ≤ 53mmol/l is appropriate for most people with Type 2 diabetes and has been shown to reduce diabetes-related complications.
A HbA1c ≤ 58mmol/l or less stringent A1c goals may be appropriate for
• people with a history of:
   • severe hypoglycaemia;
   • limited life expectancy;
   • advanced microvascular or macrovascular complications;
   • extensive co-morbid conditions; or
   • where social circumstance may prevent tight glucose control
A HbA1c ≤ 48mmol/l may be appropriate for newly diagnosed people with Type 2 diabetes and no significant co-morbidities.

Blood pressure (BP)
Hypertension in people with Type 2 diabetes should be treated aggressively with lifestyle modification and drug therapy.
People with Type 2 diabetes should be treated in general to:
• systolic blood pressure of ≤ 140mmHg;
• a diastolic blood pressure of ≤ 80mmHg
Lower systolic targets, such as < 130mmHg may be appropriate for certain individuals such as younger patients, if it can be achieved without undue treatment burden.

Based on patient characteristics, the age of the person, the presence or absence of renal disease and response to therapy, higher or lower systolic blood pressure targets may be appropriate.

Lipid management – primary target is LDL cholesterol
People with Type 2 diabetes without overt cardio- or cerebrovascular disease should be treated with a statin* with the aim to lower the LDL cholesterol to ≤ 2.5mmol/l (*except for people < 40 years with low risk of cardio- or cerebrovascular disease, people planning pregnancy or who are pregnant).
People with Type 2 diabetes with a history of overt cardio- or cerebrovascular disease should be treated with the aim to lower the LDL cholesterol to ≤ 1.8mmol/l.
In people with Type 2 diabetes treated with maximum dose statins who do not reach target LDL, a reduction of > 50% in LDL cholesterol from baseline is an alternative therapeutic goal.

While LDL cholesterol remains the primary target, desirable HDL cholesterol levels are:
- ≥ 1.0mmol/l in men; and
- ≥ 1.3mmol/l in women.

Desirable fasting serum triglycerides are ≤ 1.7mmol/l.

In clinical practice, providers may need to adjust intensity of statin therapy based on individual patient response to medication (e.g., side effects, tolerability, LDL cholesterol levels).

**Use of anti-platelet agents**
Anti-platelet therapy should not be offered for atherosclerotic cardiovascular disease prevention to patients with type 2 diabetes without cardiovascular disease. Anti-platelet therapy should be offered to all patients with Type 2 diabetes (secondary prevention) who have a previous history of a cardiovascular or a cerebrovascular event.

**See Chapter 12: Anti-platelet therapy in Type 2 diabetes**, for information on people with Type 2 diabetes with no previous cardiovascular or cerebrovascular event.

**Lifestyle**
Everyone with Type 2 diabetes should be encouraged to lose weight if necessary, eat healthily, keep alcohol intake within recommended limits, exercise regularly and everyone should be encouraged to stop smoking.

**See Chapter 7: Nutrition and dietetic care; Chapter 8: Physical activity in Type 2 diabetes**

**Retinal screening**
The Diabetic Retinal Screening Programme is a quality assured population-based; call-recall programme. Retinal screening is offered to people with diagnosed diabetes, aged 12 years and over, registered with the programme on an annual basis.

**See Chapter 13: Diabetic Retinopathy.**

**Screening for renal disease**
Everyone who has Type 2 diabetes will be checked at least once a year for diabetic renal disease.

**See Chapter 14: Management of Diabetic Nephropathy.**
Examine for foot disease
Everyone who has Type 2 diabetes will have their feet examined at each structured clinic visit according to the National Model of Foot Care (National Clinical Programme for Diabetes, 2012).

See Chapter 15 – Management of the Diabetic Foot

Their foot disease risk will be classified as:
• low;
• moderate;
• high risk; or
• active foot disease

Pre-pregnancy care
Every woman with Type 2 diabetes of childbearing age who is planning a pregnancy will be offered appropriate pre-pregnancy care.

See Chapter 19: Pre-pregnancy care

Vaccines
• Everyone who has Type 2 diabetes will be offered the pneumococcal vaccine and the annual flu vaccine
Chapter 5

Description of the Patient Visit in the Integrated Model of Care for People with Type 2 diabetes

The effective management of patients with Type 2 diabetes has the potential to make a significant contribution to the quality of life and prevention of developing diabetes-related complications.

Patient visits
The National Model of Integrated Care has been developed with the principle of proactive management of people with diabetes to maximise the quality of their outcomes.

The management of these patients in GP practices is a critical element of this proactive management. The model recommends that people with Type 2 diabetes should be seen once every 4 months. This review visit could occur with either the GP and/or the practice nurse.

The patient should also receive an annual 12-monthly review visit, which is a more comprehensive review of the patient’s health status. The GP and the practice nurse should conduct the annual review.

The following templates provide guidance and support to the GP practice about what should occur at visits to a practice by people with Type 2 diabetes, in line with the structured programme recommended by the Model of Care for Diabetes.

Chapter 5: Templates

Template 1:  First visit – initial assessment

Template 2:  Four-monthly review visit

Template 3:  Annual review (12-monthly) visit
**Template 1: First Visit - initial assessment**

At this visit the patient should be seen by the GP and the practice nurse. The following outlines the key elements of the initial assessment that should occur with a person who is newly diagnosed with Type 2 diabetes.

**Collect demographic details**

<table>
<thead>
<tr>
<th>Patient Name</th>
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</thead>
<tbody>
<tr>
<td>Address</td>
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<tr>
<td>DOB</td>
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**Unique patient identifier**

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<thead>
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<th>Female</th>
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**Ethnicity**

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<tr>
<th>Smoker</th>
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**Alcohol**

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<th>Type of diabetes</th>
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**Diagnosis of diabetes**

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<tr>
<th>Osmotic symptoms</th>
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<th>No</th>
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<tbody>
<tr>
<td>Random plasma glucose</td>
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<td></td>
</tr>
<tr>
<td>Fasting plasma glucose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-hour OGTT</td>
<td></td>
<td></td>
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<tr>
<td>Hba1c/IFCC</td>
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</table>

<table>
<thead>
<tr>
<th>Family history of diabetes</th>
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<th>No</th>
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</thead>
<tbody>
<tr>
<td>Gestational diabetes</td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Date (year) of diagnosis</th>
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**Medications and compliance history**

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<tr>
<td>MI</td>
<td>Yes</td>
</tr>
<tr>
<td>CVA</td>
<td>Yes</td>
</tr>
<tr>
<td>TIA</td>
<td>Yes</td>
</tr>
<tr>
<td>Condition</td>
<td>Yes</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>PAD</td>
<td></td>
</tr>
<tr>
<td>Erectile dysfunction</td>
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</tr>
<tr>
<td>Thyroid Disease</td>
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</tr>
<tr>
<td>Other</td>
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**Examinations**

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<tr>
<td>Waist circumference</td>
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<td></td>
</tr>
<tr>
<td>Blood Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot examination (as per National Model of Foot-Care):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot pulses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10gm monofilament</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration sensation</td>
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</tr>
</tbody>
</table>

**Investigation**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>IFCC/HbA1c</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDL cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triglycerides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full blood count</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serum creatinine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>eGFR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urine albumin creatinine ratio (ACR)</td>
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<td></td>
</tr>
<tr>
<td>TFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ferritin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serum iron and transferrin saturation</td>
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<td></td>
</tr>
<tr>
<td>Service</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>12-lead ECG</td>
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</tr>
<tr>
<td>Referral</td>
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<td></td>
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<tr>
<td>Practice nurse education</td>
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<td>No</td>
</tr>
<tr>
<td>Structured education programme</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Exercise advice</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Dietitian*</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Retinal screening</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>SMBG (self-monitored blood glucose)</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

*If not suitable for group structured education programme at time of diagnosis refer for individual session with dietitian.
**Template 2: Four-monthly review visit**

This visit can be carried out by either the GP or PN. The following outlines the key elements of the review assessment that should occur with a person with Type 2 diabetes

<table>
<thead>
<tr>
<th>Demographic detail - as the first visit</th>
<th></th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Medications</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Severe hypoglycaemia</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoglycaemia aware</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Smoker</td>
<td>Yes</td>
<td>No</td>
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</tbody>
</table>

**Examination**

<table>
<thead>
<tr>
<th>Weight</th>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>BMI</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Blood Pressure</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Foot examination (as per National Model of Foot Care):</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Foot pulses</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>10gm monofilament</th>
<th></th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Vibration sensation</th>
<th></th>
</tr>
</thead>
</table>

**Investigations**

<table>
<thead>
<tr>
<th>IFCC/HbA1c</th>
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</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Blood Pressure</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Total cholesterol*</th>
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</table>

<table>
<thead>
<tr>
<th>HDL*</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>LDL*</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Triglycerides*</th>
<th></th>
</tr>
</thead>
</table>

| Urine ACR (if positive on first or previous visit) |   |

*Patients on statin therapy, stable and within target do not require a 4-monthly lipid check but should have their lipid levels checked once a year
<table>
<thead>
<tr>
<th>Referral (if required)</th>
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<th>No</th>
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</thead>
<tbody>
<tr>
<td>Patient nurse patient education</td>
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<tr>
<td>Structured education programme</td>
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<tr>
<td>Exercise advise</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Dietitian</td>
<td>☐</td>
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<tr>
<td>SMBG (self-monitored blood glucose)</td>
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</tr>
<tr>
<td>Complications of diabetes</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>If Yes refer to secondary care</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
**Template 3: Annual review (12-monthly) visit**

At this visit the patient must be seen by the GP and/or practice nurse. The following outlines the key elements of the annual review assessment that should occur with a person with Type 2 diabetes.

**Demographic detail - as the first visit**

**Medications**
Refer to annual medication review

**Past medical history**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary artery disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile dysfunction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hypoglycaemia**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe hypoglycaemia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypoglycaemia aware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Examination**

<table>
<thead>
<tr>
<th>Measurement</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td></td>
</tr>
<tr>
<td>Waist circumstance</td>
<td></td>
</tr>
<tr>
<td>Blood Pressure</td>
<td></td>
</tr>
</tbody>
</table>

**Foot examination**

<table>
<thead>
<tr>
<th>Measurement</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot pulses</td>
<td></td>
</tr>
<tr>
<td>10gm monofilament</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Vibration sensation</td>
<td></td>
</tr>
<tr>
<td><strong>Eyes</strong></td>
<td></td>
</tr>
<tr>
<td>Retinal Screening</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Investigations</strong></td>
<td></td>
</tr>
<tr>
<td>IFCC/HbA1c</td>
<td></td>
</tr>
<tr>
<td>Total cholesterol</td>
<td></td>
</tr>
<tr>
<td>HDL</td>
<td></td>
</tr>
<tr>
<td>LDL</td>
<td></td>
</tr>
<tr>
<td>Triglycerides</td>
<td></td>
</tr>
<tr>
<td>Full Blood count</td>
<td></td>
</tr>
<tr>
<td>Creatinine</td>
<td></td>
</tr>
<tr>
<td>eGFR</td>
<td></td>
</tr>
<tr>
<td>Urine Albumin Creatinine Ratio</td>
<td></td>
</tr>
<tr>
<td>TFT</td>
<td></td>
</tr>
<tr>
<td>LFT</td>
<td></td>
</tr>
<tr>
<td>Vitamin B12 (only if on metformin)</td>
<td></td>
</tr>
<tr>
<td>Referral (if required)</td>
<td>Yes</td>
</tr>
<tr>
<td>Patient nurse patient education</td>
<td>Yes</td>
</tr>
<tr>
<td>Structured education programme</td>
<td>Yes</td>
</tr>
<tr>
<td>Exercise advise</td>
<td>Yes</td>
</tr>
<tr>
<td>Dietitian</td>
<td>Yes</td>
</tr>
<tr>
<td>Retinal Screening</td>
<td>Yes</td>
</tr>
<tr>
<td>SMBG</td>
<td>Yes</td>
</tr>
<tr>
<td>Complications of diabetes</td>
<td>Yes</td>
</tr>
<tr>
<td>If Yes refer to secondary care</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 6
The consultation with the practice nurse

Guidelines for consultations by the practice nurse with the person with Type 2 diabetes, including first visit and review visits (both 4-monthly and annual).

The practice nurse plays a key role in the care of people with Type 2 diabetes. She manages this care within the scope of the NMPI Scope of Practice (2015) and in collaboration with the GP and the multidisciplinary team.

The practice nurse will often identify high-risk people attending the GP practice and recommend screening for Type 2 diabetes. Practice nurses are frequently the first point of contact for the person at diagnosis of diabetes and the first person to educate and explain the clinical importance of their diabetes diagnosis. They are involved in the on-going long-term holistic care of the person with Type 2 diabetes.

The practice nurse is a key member of the diabetes team. To make sure people with Type 2 diabetes get the best possible care it is key that the practice nurse has regular communication with:

• the general practitioner (GP);
• integrated care diabetes nurse specialist
• podiatry
• dietitian
• hospital-based diabetes specialist service
• public health nurse where appropriate;

This regular communication will make the National Model of Integrated Care for people with Type 2 diabetes a success.

It will also be important for the practice nurse to attend an accredited diabetes module and regular educational updates on the management of Type 2 diabetes. The algorithms in Tables 3 and 4, at the end of this chapter, have been developed to guide the practice nurse in the care of people with Type 2 diabetes.

Auditing your service
It is important that everyone involved in integrated care is committed to on-going improvement of the service and audits their care. Suggested areas of audit include:

• the percent of people who have a complete new patient profile in place;
• the referrals made to specialists or to other members of the primary care team;
• that referral documentation is complete;
• evidence that the newly diagnosed patient received appropriate education in relation to self-management and dealing with diagnosis; and
• evidence that the practice nurse assessment of the patient, who has been newly diagnosed with diabetes, has addressed all key areas

Chapter 6: Tables and appendices

Table 3: Algorithm of practice nurse session/consultation with patient on self-management and education

Table 4: Algorithm of practice nurse or GP review consultation with patient

Appendix 9: Practice nurse assessment for first consultation with newly diagnosed person with Type 2 diabetes

Appendix 10: First consultation with newly diagnosed person with Type 2 diabetes: overview of the practice nurse education session

Appendix 11: Individual profile: new diagnosis of Type 2 diabetes

Appendix 12: Practice nurse assessment for review consultations of person with Type 2 diabetes

Appendix 13: Overview of the practice nurse education session for review consultation of person with Type 2 diabetes

Appendix 14: Type 2 diabetes: individual profile, review visit
Table 3: Algorithm of practice nurse session/consultation with patient on self management and education

Outline of the session/consultation to be conducted by the practice nurse with a newly diagnosed person with Type 2 diabetes in relation to self-management and education after diagnosis

<table>
<thead>
<tr>
<th>Step</th>
<th>Reference material / key notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis made of T2DM and patient informed.</td>
<td></td>
</tr>
<tr>
<td>Patient receives PN consultation within 2 weeks of diagnosis of T2DM.</td>
<td>Appendix 9</td>
</tr>
<tr>
<td>PN conducts assessment with patient.</td>
<td></td>
</tr>
<tr>
<td>PN provides appropriate education session supported with appropriate patient educational material (at practice discretion) including: nutrition, exercise and foot-care information booklets. Guidance regarding frequency of blood glucose testing.</td>
<td>Appendix 10</td>
</tr>
<tr>
<td>PN assessment: patient referred to specialist/other services as necessary. Patient referred to structured education programme.</td>
<td></td>
</tr>
<tr>
<td>All referrals to specialist/other services supported with required referral information.</td>
<td>Appendix 11</td>
</tr>
<tr>
<td>PN: completes the New Patient Profile completing all section of the profile</td>
<td></td>
</tr>
<tr>
<td>PN agrees date for review consultation with patient.</td>
<td></td>
</tr>
</tbody>
</table>
Table 4: Algorithm of practice nurse or GP review consultation with patient

Outline of a review consultation by practice nurse with the person with Type 2 diabetes. If review is carried out by the GP, then the same process should be followed.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PN assessment (as needed may not be necessary on all reviews)</td>
</tr>
<tr>
<td>2.</td>
<td>PN provides appropriate education session supported with appropriate patient educational material (at practice discretion) including: nutrition, exercise and foot-care information booklets. Guidance re frequency of blood glucose testing.</td>
</tr>
<tr>
<td>3.</td>
<td>Patient referred to specialist/ other services as necessary</td>
</tr>
<tr>
<td>4.</td>
<td>All referrals to specialist/ other services supported with required referral information.</td>
</tr>
<tr>
<td>5.</td>
<td>PN: Completes Review Visit Patient Profile – ensures all sections are filled in.</td>
</tr>
<tr>
<td>6.</td>
<td>PN sets up next review appointment with patient for PN and/or GP as deemed necessary.</td>
</tr>
</tbody>
</table>

Reference material / key notes

- Appendix 12
- Appendix 13
- Appendix 14
Appendix 9: Practice nurse assessment for first consultation with newly diagnosed

<table>
<thead>
<tr>
<th>Practice nurse introduces themselves to the patient and outlines their role in the patient’s care delivery process.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN assesses if the person with diabetes has the:</td>
</tr>
<tr>
<td>• Knowledge and behavioural skills necessary for optimal self-care; and</td>
</tr>
<tr>
<td>• Ability to make early and effective responses to everyday problems.</td>
</tr>
<tr>
<td>The PN will assess the clinical and personal needs of each individual patient and be aware of the needs of the special groups:</td>
</tr>
<tr>
<td>• Visual impairment;</td>
</tr>
<tr>
<td>• Intellectual, physical, mental disability;</td>
</tr>
<tr>
<td>• Language barriers; and</td>
</tr>
<tr>
<td>• Include family members and carers as appropriate.</td>
</tr>
<tr>
<td>PN considers the needs for assisted self-care for those with cognitive or physical impairment.</td>
</tr>
<tr>
<td>PN assesses, on an individual patient basis, the suitability for PN educational session and also refers to structured education programme. PN assesses the individual’s knowledge of diabetes, the aims of management and ability to define personal healthcare targets. Set realistic goals and targets</td>
</tr>
<tr>
<td>PN examines the feet and classifies foot as either low/moderate/high or active foot as per national model of foot care. PN follows/initiates the appropriate care pathway as per national model of care.</td>
</tr>
<tr>
<td>PN provides anticipatory guidance and counselling to promote health, reduce risk factors and prevent disease and disability via patient education/self-management skills.</td>
</tr>
<tr>
<td>PN provides educational session.</td>
</tr>
<tr>
<td>See Appendix 10: First consultation with newly diagnosed person with Type 2 diabetes: overview of the practice nurse education session.</td>
</tr>
</tbody>
</table>
Appendix 10

Appendix 10: First consultation with newly diagnosed person with Type 2 diabetes: overview of the practice nurse education session

The practice nurse should cover the following topics in the education section of the consultation with the person newly diagnosed with Type 2 diabetes.

Understanding diabetes
The understanding of Type 2 diabetes aetiology.

Explain to patient the effect poorly controlled diabetes can have on the development of diabetes-related complications, like vulnerability to:

- Arterial disease;
- Retinopathy;
- Cardiovascular disease;
- Nephropathy; and
- Neuropathy

Information should be supported with relevant educational material.

Regular Reviews
The PN should discuss the importance of regular and annual reviews with their GP or specialist in secondary care.

Blood Glucose Monitoring
Where appropriate, the practice nurse should educate the patient about blood glucose self-monitoring skills.

This should cover;

- Targets;
- Technique;
- Hand-hygiene;
- Meter calibration and storage;
- Sharps disposal; and
- Frequency of blood glucose testing as detailed in the National Model of Integrated Care.

The practice nurse should also explain how to interpret the blood glucose monitoring results and what action they need to take. This should include education about the symptoms, causes and treatment of:

- Hypoglycaemia; and
- Hyperglycaemia.

The PN should explain ‘sick-day’ rules and management of diabetes.
Appendix 10: Continued

**Lifestyle Issues**
The practice nurse should support and encourage appropriate behaviours known to improve outcomes.

This should include information about:
- Footwear;
- Physical activity as per abilities;
- Insurance cover;
- Driving if appropriate ([www.rsai.ie](http://www.rsai.ie), 2013); and
- Membership of diabetic associations and support groups such as Diabetes Ireland.

**Smoking Cessation**
The practice nurse should give smoking cessation advice and referral to smoking cessation service where necessary. The person should be advised about the benefits associated with smoking cessation.

**Other advice**
The practice nurse should also;
- Give advice about travel and insurance – including information about getting an ID bracelet as necessary;
- Ask about psychological well-being; and
- Give advice about driving ([www.rsai.ie](http://www.rsai.ie), 2013).

The practice nurse should ask about the person’s current activity and exercise patterns and make recommendation for exercise. Other areas to cover include;
- Diet and nutrition;
- Alcohol intake;
- Preconception advice as per National Care Programme;
- Erectile dysfunction – causes and treatments;
- Foot education and care advice as per National Model of Care of the Diabetic Foot (National Diabetes Programme, 2012); and
- Long-term illness entitlements.

**Medication**
The practice nurse should advise the person with diabetes about managing their medication. They should explain the medication and its:
- Purpose;
- Benefit;
- Mode of action;
- Timing; and
- Potential side effects.
Appendix 10: Continued

Integrate Care
The practice nurse providing diabetes care within general practice will, where necessary integrate patient education into regular clinical care during the clinical consultation. All data will be recorded and collected:

- At the first visit (Appendix 11: Individual profile: new diagnosis of Type 2 diabetes); and
- On review visit (Appendix 14: Type 2 diabetes: individual profile, review visit).

All educational sessions will be supported with appropriate written educational material.
## Appendix 11: Individual profile – new diagnosis of Type 2 diabetes

### Type 2 education checklist

<table>
<thead>
<tr>
<th>Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>DOB/MRN (medical record number)</td>
<td></td>
</tr>
<tr>
<td>Practice name</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>

### What is Type 2 diabetes?
- [ ]

### Blood glucose testing
- Technique
- Targets
- Frequency
- Safe sharps disposal
- Oral hypoglycaemic agents
- Hyperglycaemia: symptoms, causes and management
- Sick day rules and illness
- Lifestyle issues
  - Smoking
  - Alcohol
- Sport/Exercise
- Employment
- Travel and insurance advice
- Driving
- Patient support group/Diabetes Ireland
- Potential diabetes complications and prevention strategies
- Education session supported with literature
## Foot Assessment as per National Foot Care Programme

<table>
<thead>
<tr>
<th>Results</th>
<th>Low</th>
<th>Moderate</th>
<th>High Risk</th>
<th>Active</th>
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</thead>
<tbody>
<tr>
<td>Podiatry referral</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urgent podiatry referral</td>
<td>Yes</td>
<td>No</td>
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### Comments

### Treatment goals

Comments

### Next appointment date

---

## Type 2 assessment checklist

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<th>Date of diagnosis</th>
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<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>M</td>
</tr>
<tr>
<td>Weights</td>
</tr>
<tr>
<td>Waist</td>
</tr>
<tr>
<td>Height</td>
</tr>
<tr>
<td>BMI</td>
</tr>
<tr>
<td>Blood pressure (mmHg)</td>
</tr>
<tr>
<td>Alcohol</td>
</tr>
<tr>
<td>Smoking status:</td>
</tr>
<tr>
<td>Occupation</td>
</tr>
<tr>
<td>Social Support</td>
</tr>
<tr>
<td>Current Medications</td>
</tr>
<tr>
<td>Known allergies</td>
</tr>
<tr>
<td>Entitlements</td>
</tr>
</tbody>
</table>
### Appendix 11: Continued

<table>
<thead>
<tr>
<th>Patient Consent</th>
<th>Yes ☐</th>
<th>No ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of Care:</td>
<td>Hospital ☐</td>
<td>GP ☐</td>
</tr>
</tbody>
</table>

**Patients perception of diabetes diagnosis**

<table>
<thead>
<tr>
<th>Preconception advice</th>
<th>Contraception ☐</th>
<th>Folic Acid ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erectile dysfunction</td>
<td>☐</td>
<td>Current Treatment</td>
</tr>
<tr>
<td>IFCC (HbA1c)</td>
<td>mmol/mol</td>
<td>Date</td>
</tr>
<tr>
<td>Liquid profile</td>
<td>Fasting</td>
<td>Non-fasting</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td></td>
<td>Triglyceride</td>
</tr>
<tr>
<td>HDL</td>
<td></td>
<td>LDL</td>
</tr>
<tr>
<td>FBC</td>
<td>Ferritin</td>
<td>B12</td>
</tr>
<tr>
<td>Serum iron/transferrin saturation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver function tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid function test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal Profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creatinine, eGFR mls/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage CKD:</td>
<td>1 ☐</td>
<td>2 ☐</td>
</tr>
<tr>
<td>ACR mg/mmol (if positive at first visit)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Referrals (where appropriate)</th>
<th>Dietetic consultation ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNS diabetes ☐</td>
<td></td>
</tr>
<tr>
<td>Ophthalmology referral ☐</td>
<td></td>
</tr>
<tr>
<td>Psychology ☐</td>
<td></td>
</tr>
<tr>
<td>Structured education programme ☐</td>
<td></td>
</tr>
<tr>
<td>Secondary care ☐</td>
<td></td>
</tr>
<tr>
<td>Public health nurse ☐</td>
<td></td>
</tr>
<tr>
<td>Other specialist referral ☐</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 12: Practice Nurse Assessment for Review Consultations of person with T2DM

Practice Nurse introduces themselves to the patient and outlines their role in the patient’s care delivery process.

PN re-assesses if the person with diabetes has;
- The knowledge and behavioural skills necessary for optimal self-care
- The ability to make early and effective responses to everyday problems

The PN will re-assess the needs of each individual patient and be aware of the needs of special groups; visual impairment, intellectual, physical, mental disability, language barriers and include family members and carers as appropriate.

PN considers; the need for assisted self-care for those with cognitive or physical impairment

PN re-assesses as per individual patient basis the suitability for PN educational session. PN re-assesses their knowledge of diabetes, the aims of management and ability to define personal health-care targets. Reviews older and/or sets realistic goals and targets.

PN examines feet and classifies foot as either low/moderate/high or active foot as per national model of foot care. Patient referred to specialist centre as per national model of care.

Provides anticipatory guidance and counselling to promote health, reduce risk factors and prevent disease and disability via patient education/self management skills.

PN re-education session as per PN education Algorithm (see Table 4) pending individual patient requirements. PN provides educational session.

See appendix 13; The practice nurse education session for review consultation of person with type 2 diabetes
Appendix 13

Appendix 13: Practice nurse education session for review consultation of person with Type 2 diabetes

The practice nurse should cover the following topics in the education section of the consultation with the person with Type 2 diabetes.

**Understanding**
Review the person’s understanding of diabetes, including Type 2 diabetes aetiology and the effect poorly controlled diabetes can have on the development of diabetes-related complications. This includes vulnerability to:
- arterial disease
- retinopathy
- cardiovascular disease
- nephropathy
- neuropathy

The information session should be supported with relevant educational material.

**Reassess Knowledge**
At the review consultation, the nurse should reassess the knowledge of the person with Type 2 diabetes around self-management of diabetes, including:
- the importance of regular and annual reviews with their GP or specialist in secondary care; and
- blood glucose monitoring where appropriate

The practice nurse should promote self-management skills by providing information about blood glucose self-monitoring skills.

**Review Lifestyle Issues**
The practice nurse should support and encourage appropriate behaviours known to improve outcomes. This should include:
- footwear;
- physical activity as per abilities; and
- membership of diabetic associations and support groups such as Diabetes Ireland

**Smoking Cessation**
The practice nurse should give smoking cessation advice and referral to smoking cessation where necessary. The person should be advised about the benefits associated with smoking cessation.
Appendix 13: Continued

Other Advice
The practice nurse should also:
- give advice about travel and insurance advice – including information about getting an ID bracelet as necessary;
- ask about psychological well-being; and
- give advice about driving

The practice nurse should ask about current activity and exercise patterns and make recommendations for exercise.

Other areas to cover include:
- diet and nutrition;
- alcohol intake;
- preconception advise as per National Care Programme; and
- foot education and care advise as per National Model of Care for the Diabetic Foot

Medication
The practice nurse should advise the patient about managing their medication. They should explain the medication and its;
- purpose;
- benefit;
- mode of action;
- timing; and
- Potential side effects

Integrated Care
The practice nurse providing diabetes care within general practice will, where necessary, integrate patient education into regular clinical care during the clinical consultation. All data will be recorded and collected;
- At the first visit (see appendix 11: Individual profile: new diagnosis of Type 2 diabetes); and
- On review visit (see appendix 13: Type 2 Diabetes: individual profile, review visit)

All educational sessions will be supported with written educational material.
# Appendix 14

## Appendix 14: Type 2 diabetes: Individual profile, review visit

### Type 2 education checklist

<table>
<thead>
<tr>
<th>Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>DOB/MRN (medical record number)</td>
<td></td>
</tr>
<tr>
<td>Practice name</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
</tr>
<tr>
<td><strong>What is Type 2 diabetes?</strong></td>
<td>☐</td>
</tr>
<tr>
<td>Blood glucose testing</td>
<td>Technique ☐</td>
</tr>
<tr>
<td></td>
<td>Targets ☐</td>
</tr>
<tr>
<td></td>
<td>Frequency ☐</td>
</tr>
<tr>
<td></td>
<td>Safe sharps disposal ☐</td>
</tr>
<tr>
<td>Oral hypoglycaemic agents</td>
<td>☐</td>
</tr>
<tr>
<td>Hypoglycaemia: symptoms, causes and management</td>
<td>☐</td>
</tr>
<tr>
<td>Sick day rules and illness</td>
<td>☐</td>
</tr>
<tr>
<td><strong>Lifestyle issues</strong></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>☐</td>
</tr>
<tr>
<td>Alcohol</td>
<td>☐</td>
</tr>
<tr>
<td>Sport/Exercise</td>
<td>☐</td>
</tr>
<tr>
<td>Employment</td>
<td>☐</td>
</tr>
<tr>
<td>Travel and insurance advice</td>
<td>☐</td>
</tr>
<tr>
<td>Driving</td>
<td>☐</td>
</tr>
<tr>
<td><strong>Patient support group/Diabetes Ireland</strong></td>
<td>☐</td>
</tr>
<tr>
<td>Potential diabetes complications and prevention strategies</td>
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<td>Education session supported with literature</td>
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## Foot Assessment as per National Foot Care Programme

<table>
<thead>
<tr>
<th>Results</th>
<th>Low</th>
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<table>
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<tr>
<td>Urgent podiatry referral</td>
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### Comments

### Treatment goals

### Comments

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### Type 2 assessment checklist

<table>
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<td>Current Medications</td>
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<td>Entitlements</td>
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## Appendix 14: Continued

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<td>Preconception advice</td>
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<td>IFCC (HbA1c)</td>
<td>mmol/mol</td>
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<td>Non-fasting</td>
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<td>Creatinine, eGFR mls/min</td>
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<td>ACR mg/mmol (if positive at first visit)</td>
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<td>Referrals (where appropriate)</td>
<td>Dietetic consultation</td>
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<td>Ophthalmology referral</td>
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<td>Other specialist referral</td>
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Chapter 7

Nutrition and Dietetic care

The Dietitian plays a key role in the care of people with diabetes. Achieving a healthy diet and lifestyle is the cornerstone of the management of diabetes. It is recommended that all people with diabetes are referred to a dietitian at diagnosis and for ongoing regular review. Care may occur via one-to-one appointments or group education.

**Aim of dietetic care**

The aim is to devise and deliver dietetic care, based on current evidence and best practice, which helps the individual to make and maintain lifestyle changes that are best suited to their particular needs, expectation and capabilities.

Dietetic care aims to give information and advice to empower people with diabetes to apply the principles of a healthy eating plan for diabetes and promote healthy lifestyle choices that support a reduction in cardiovascular risk. For example, a healthier body weight, improved physical activity, smoking cessation, a healthy alcohol intake and stress management. Dietetic care also aims to empower the individual to develop the skills, knowledge and confidence to self-manage their diabetes, both at diagnosis and as needed thereafter.

**Dietetic targets**

Dietetic care aims to help people achieve blood glucose, blood pressure and lipid targets in line with the National Model of Integrated Care and to;

- ensure the nutritional adequacy and balance of the diet
- prevent and treat diabetes-related complications
- empower the patient to achieve and maintain healthier body weight as appropriate

It aims to address an individual’s need taking into consideration personal/cultural preferences and lifestyle, and respecting wishes and willingness to change.

**The Community Dietitian is responsible for:**

- One to one dietetic interventions, delivered within the primary care setting and supporting National Model of Care. Clients receive individually tailored assessment and interventions supported by collaborative goal setting and management techniques.
- Delivery of diabetes structured patient education via an accredited group programme. Programmes aim to empower participants to develop self-management skills.
- Involvement in the multidisciplinary primary care team (PCT) – regular liaison facilitating optimum integrated patient care
- Regular liaison with the acute dietetic and secondary care diabetes services to support the patient in the integrated care pathway
- On-going audit and evaluation as part of care provision.
• Provision of education around dietetic management of diabetes to health professional colleagues

Audit
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to people with Type 2 diabetes are:
• Numbers of new and review referrals
• Waiting times and attendance rates
• Evidence of
• Changes in clinical outcomes including BMI, HbA1c and lipids
• Changes in patient empowerment and satisfaction scores

Chapter 7: Appendices
Appendix 15: Dietetic Consultation with the person with Type 2 diabetes

Appendix 16: Dietetic Patient Care Pathway for Type 2 diabetes in Primary Care
Appendix 15: Dietetic Consultation with the person with Type 2 diabetes

The dietitian should cover the following during the consultation(s) with the person newly diagnosed with Type 2 diabetes.

Client-centred interpersonal skills should be used to gain an understanding of the following:
- understanding and implications of the diagnosis of diabetes;
- the need for dietary therapy;
- expectation with regard to weight loss or gain and other treatment outcomes
- motivation to change lifestyle and how the dietitian can help the person with diabetes implement this change

Use interpersonal skills and tools to assess the patient’s willingness and ability to make diet and lifestyle changes focusing on:
- importance and confidence
- reasons for change
- pros and cons of change
- assessment of ambivalence

Clinical assessment
At the clinical assessment the dietetic review should note:
- medical history
- psychosocial history, including mental health status
- medications
- relevant biochemistry (as per agreed dataset);
- blood pressure
- weight
- height
- BMI and waist circumference;
- weight history and previous attempts at weight loss
- weight loss goal if they are overweight or obese
Appendix 15: Continued

Assessment of current lifestyle: diet, physical activity, smoking and alcohol intake
Through use of interpersonal skills the dietitian will aim to gather specific information to establish a picture of current dietary intake whilst minimising guilt or embarrassment. This will include discussion on:

- potential difficulties with changing eating and activity patterns
- previous alterations in eating habits, why they were done and how successful they were / learning from same
- usual dietary intake
- portion sizes
- daily routine and how food fits into this routine
  - the hours and days of work;
  - the number of meals and snacks eaten;
  - social eating occasions;
  - alcohol intake;
  - any other relevant information

Education by the Dietitian
Note: the topics below should be covered over a series of sessions, depending on the patient’s needs.

The Dietitian will provided education to the person with diabetes on the role of diet and lifestyle modifications in the management of their diabetes and reducing the risk of diabetes related complications e.g. cardiovascular disease.

This will include the following:
- Healthy Food Choices
  - Estimated Energy Requirement
  - Portion sizes
  - Nutritional balance
  - Carbohydrate awareness
  - Fats / blood lipid management
  - Reading food labels
  - Meal routine
Appendix 15: Continued

- Weight management (see below);
- Physical activity / Sedentary activity
- Alcohol (recommended limits, standard drink sizes, impact on diabetes and weight etc)
- Smoking (provide information / refer to appropriate services)
- Stress management
- Managing and preventing hypoglycaemia and hyperglycaemia;
- Possible complications of diabetes and cardiovascular co-morbidities – how to minimise these through lifestyle; medications
- Sick days
- Holidays
- Allowances and entitlements, as appropriate

BMI and weight management
Weight management should be the primary nutritional strategy in managing glucose control in Type 2 diabetes for people who are overweight or obese. A realistic target weight and BMI will be discussed, as appropriate (minimum 5-10%).

Weight management therapy should consider:
1. a ‘weight loss’ phase of at least 6 months (or until realistic goals are achieved) with optimal weight loss of 1-2lbs/week;
2. a ‘weight maintenance’ phase, which may require long-term support.

For patients with BMI >40kg/m² referral for bariatric surgery at specialist centre should be considered.

For those over 60 years of age, avoidance of weight gain may be considered a success.

Patient goals
Following assessment the dietitian and patient should agree personalised dietary objectives and individual, achievable goals. The dietitian will use action planning and problem solving to set SMART goals:

The dietitian will;
- provide written advice and relevant resources
- encourage self-monitoring through use of food and activity diaries or self-weighing or both
- discuss the use of rewards as a motivational tool and assess the patient’s understanding of their agreed plan of action
- identify possible need for referral to other health professionals within the primary care team
Appendix 15: Continued

**Dietetic Review Consultation**

Regular review with the dietitian should be offered as appropriate, covering the following:

- feedback from the patient on progress since the initial consultation
- reassessment of patient understanding of previous consult and goals set
- discussion on what has gone well and what could be improved on in relation to diet and lifestyle goals
- problem solving difficulties if any, which have may have arisen
- review of available clinical and biochemical data
- reassessment of weight and BMI targets
- continued dietetic advice, covering additional topics around diet and diabetes (as outlined above), as appropriate
- negotiation of new goals, as appropriate
- discussion around support systems and rewards, as appropriate
- discussion regarding maintenance of new behaviours, handling setbacks or high-risk situations, as appropriate
- provision of written advice and resources, as appropriate
- record of any relevant information on the patient’s dietetic record card
- arrangement of follow-up consultation appointment(s). An annual dietetic review is recommended. Complex clients may need more regular reviews, as deemed appropriate by the dietitian and depending on local resources
- management of co-morbidities as needed
Appendix 16: Dietetic Patient Care Pathway for Type 2 Diabetes in Primary Care

- **New diagnosis of Type 2 Diabetes**
  - Offer group structured education
  - Group-based structured education programme with dietitian
  - Attendance at the programme. Education on diet, lifestyle and explanation of clinical outcomes
  - Group-based refresher session within 6 months. Refresher of core programme and review of clinical outcomes
  - Group-based annual session. Refresher of core programme and review of clinical outcomes

- **Existing Type 2 diabetes**
  - Offer review appointments as per patient needs, for example, 3 monthly Education
  - Offer annual review Education
  - Initial 45-minute appointment. Initiation of education on diet, lifestyle and explanation of clinical outcomes
  - Dietitian links with MDT and involves as appropriate, for example, podiatry, physio, OT, psychology
  - Inter-referral to support patient as needed

- **One-to-one appointment with dietitian (if not suitable for group education)**
  - Offer group structured education
Chapter 8

Physical Activity in Type 2 diabetes

Introduction
Diet and physical activity (PA) are central to the management and prevention of Type 2 diabetes and should be encouraged for everyone who has diabetes (ACSM/ADA Joint position statement 2010). In people with diabetes PA has been shown to improve:

- blood glucose levels;
- insulin action and sensitivity;
- lipid profile;
- systolic blood pressure;
- weight management – loss and maintenance; and
- quality of life

Greater PA and fitness are associated with a lower risk of all-cause CV mortality (ACSM/ADA Joint position statement 2010).

Clinical monitoring
You should ask the person with diabetes about PA, frequency and type of exercise at each clinic visit. Highlight the benefit of PA at each clinic visit.

Types of exercise
Aerobic exercise includes:
- walking;
- cycling;
- jogging; and
- swimming

An individual should be able to carry on a short conversation while doing aerobic exercise. It is recommended that people with diabetes should do at least 150 minutes of aerobic exercise per week. The exercise should be spread out over 3 to 5 days per week, with aerobic exercise on at least 2 non-consecutive days.

Refer patients to HSE and Healthy Ireland website promoting physical activity in Ireland getirelandactive.ie to find out information on how to get started and get more active, and for information on clubs, groups and activities in their local areas.
Resistance
Resistance exercise is short in duration and high in intensity. Resistance exercise includes:

- short sprints;
- hill climbing; or
- interval training.

It is recommended that people with diabetes should do resistance exercise 1-2 times per week on non-consecutive days. They should start slowly and build up gradually.

Combine diet and exercise
Physical activity in isolation is not an effective strategy for weight loss in people with Type 2 diabetes unless 60 minutes per day is undertaken. However, a combination of diet and physical activity results in greater weight reduction than diet or physical activity alone.

See Appendix 17: A combination of both aerobic and resistance exercise is recommended for people with Type 2 diabetes (ACSM/ADA Joint position statement 2010)

The FITT principle
Encourage structured exercise: the FITT principle (next page) can be used to help determine the level and type of activity. For people who are sedentary, the focus should be on establishing a regular pattern of low-to-moderate intensity activity before increasing the duration of activity and, finally if appropriate, the intensity of the exercise. Encourage people to consider how long they spend in sedentary behaviours in a day and/or over a week and encourage them to increase their activities of daily living.

Avoiding hypoglycaemia
People treated with insulin or insulin secretagogues, should take care to minimise the impact of hypoglycaemia, which can occur up to 24 hours after physical activity (Diabetes UK 2001). For patients on insulin/sulphonylureas the issue of hypoglycaemia risk needs to be addressed.

People with Type 2 diabetes on insulin who plan to exercise, should reduce their insulin dose prior to exercise (ask for specialist advise re dose reduction and insulin injection to be reduced).

If exercise is unplanned, additional carbohydrates are recommended. A 70kg man undertaking exercise needs about 10-15g extra carbohydrate (CHO)/hour.

Encourage people to check their blood glucose before and after exercise to understand how their body responds to exercise. People on therapies like insulin/sulphonylureas or other insulin secretagogues should eat carbohydrates before exercise if their glucose levels are < 5.6mmol/l (Diabetes Care 2011).
The FITT principle

Frequency
Exercise should be taken 3-5 days per week. More frequent exercise is desirable, but care should be taken to first establish a regular exercise habit before recommending levels that may not be sustainable.

Intensity
Avoid musculoskeletal injuries and promote compliance by starting at a low to moderate intensity and gradually progressing over the course of several weeks or months to more vigorous efforts (if desired by the patient). The emphasis should be on increasing duration rather than intensity, with the goal of optimising caloric expenditure.

Time
The patient should aim for 30-60 minutes, using a gradual progression. Multiple short bouts produce similar benefits as a single long bout of the same duration.

Type
Encourage low impacts activities that are convenient, accessible and perceived as enjoyable by the patient, for example:
- Walking
- Cycling
- Low impact aerobics
- Water exercise

Chapter 8: Appendix

Appendix 17: A combination of both aerobic and resistance exercise is recommended for people with Type 2 Diabetes
Appendix 17: A combination of both aerobic and resistance exercise is recommended for people with Type 2 Diabetes

Person with T2DM

Pre-Exercise Evaluation

Low to Moderate Exercise Intensity (such as brisk walking)

Discuss with GP

No cardiac symptoms

Can Start Exercise

Low to Moderate Exercise Intensity in patient with autonomic neuropathy, postural hypotension or with abnormal 12 lead ECG

Cardiac Symptoms

Screen for Cardiac disease (for example exercise stress test) or direct referral to cardiology if cardiac symptoms.

Stress test negative, start exercise programme

Stress test positive, refer to cardiology

Moderate to Vigorous Exercise Intensity (more than brisk walking)

Adapted from the American College of Sports Medicine and the American Diabetes Association: Joint Position Statement Diabetes Care; Vol 33, Number 12, 2010 147 - 167
Tight control of blood glucose with diet and/or medication reduces long-term diabetes-related complications and is central to the overall management of diabetes.

**Targets** - Blood glucose target should be individualised and discussed with the patient. An HbA1c \( \leq 53 \text{mmol/l} \) is appropriate for most people with Type 2 diabetes and has been shown to reduce diabetes-related complications.

A HbA1c \( \leq 58 \text{mmol/l} \) or less stringent A1c goals may be appropriate for:
- people with a history of:
  - severe hypoglycaemia;
  - limited life expectancy;
  - advanced microvascular or macrovascular complications;
  - extensive co-morbid conditions; or
  - where social circumstance may prevent tight glucose control

A HbA1c \( \leq 48 \text{mmol/l} \) may be appropriate for newly diagnosed people with Type 2 diabetes and no significant co-morbidities.

Targets should be set in consultation with the individual. Targets should be seen as a guide because a person’s individual circumstances need to be considered when setting and agreeing targets (American Diabetes Association, Clinical Practice Recommendations 2016; National Institute for Clinical Excellence 2015; ADA Hyperglycaemia Position Paper 2012).

**Clinical monitoring**
The HbA1C should be checked more than twice a year in patients to maintain treatment targets. If target HbA1c is not achieved and a change to treatment is required then it should be repeated every four months and treatment adjusted as appropriate. Point-of-care testing for HbA1C provides the opportunity for more timely treatment changes.

**Self Monitoring** (National Institute for Clinical Excellence 2015)

Do not routinely offer self-monitoring of blood glucose levels for adults with type 2 diabetes unless:
- the person is on insulin or
- there is evidence of hypoglycaemic episodes or
• the person is on oral medication that may increase their risk of hypoglycaemia while driving or operating machinery or increasing activity level
• or the person is pregnant, or is planning to become pregnant

Consider short-term self-monitoring of blood glucose levels in adults with Type 2 diabetes (and review treatment as necessary):
• when starting treatment with oral or intravenous corticosteroids or
• intercurrent illness or
• when glucoses reading very high at diagnosis or
• to confirm suspected hypoglycaemia

Be aware that adults with type 2 diabetes who have acute intercurrent illness are at risk of worsening hyperglycaemia. Review treatment as necessary.

If adults with type 2 diabetes are self-monitoring their blood glucose levels, carry out a structured assessment at least annually. The assessment should include:
• the person's self-monitoring skills
• the quality and frequency of testing
• checking that the person knows how to interpret the blood glucose results and what
• action to take
• the impact on the person's quality of life
• the continued benefit to the person
• the equipment used

The National Clinical programme for Diabetes guidance on self testing for people with Type 2 diabetes can be downloaded from http://www.hse.ie/eng/about/Who/clinical/natclinprog/diabetesprogramme/Selftesting/ or ordered from www.healthpromotion.ie to assist patients to understand the guidelines.

The Medicines Management programme report on Self-Monitoring of Blood Glucose (SMBG) in Type 2 Diabetes is available on www.hse.ie/yourmedicines along with Frequently Asked Questions for healthcare professionals and patients.

Treatment
Healthy eating and exercise are the cornerstones of Type 2 diabetes management, but frequently people need the addition of medications to help improve blood glucose control. The following are medications recommended for people who are having difficulty meeting the HbA1c agreed targets.

See Table 5: Medications recommended for people who have difficulty meeting the HbA1c agreed targets
Audits
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to patients with Type 2 diabetes are:

- frequency of checking a patient’s IFCC/HbA1c;
- evidence of intervention taken, either pharmacotherapy or non-pharmacotherapy, in patients who are not meeting IFCC/HbA1c targets;
- number of people on 2 or more hypoglycaemic agents to achieve target glucose control; and
- effect of one glucose lowering agent on measured IFCC/HbA1c.

Treatment algorithms
We include treatment algorithms to help guide you in the medication management of Type 2 diabetes, see Tables 5-7 in this chapter. All treatment should again be given in conjunction with advice on dietary intake and physical activity.

Chapter 9: Tables
Table 5: Medications recommended for people who have difficulty meeting the IFCC/HbA1c agreed targets

Tables 6-7: Algorithms to help guide you in the medication management of Type 2 diabetes
### Table 5: Medications recommended for people who have difficulty meeting the IFCC/HbA1c agreed targets

<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Expected ↓ HbA₁c mmol/mol (%)</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First line therapy - Metformin</strong></td>
<td>11-22 mmol/mol (1.0-2.0%)</td>
<td>Effective for managing glucose targets, Promotes weight loss, No hypoglycaemia, Long term data available for its efficacy</td>
<td>Nausea, flatulence, diarrhoea – titrate dose slowly, May cause Vitamin B12 deficiency – should be checked annually, <strong>Renal impairment</strong> Review dose if serum creatinine ≥ 130 umol/L or eGFR &lt; 45ml/min, Stop metformin if serum creatinine &gt;150umol/l or eGFR &lt;30ml/min – risk of Lactic Acidosis, Prescribe with caution for those at risk of a sudden deterioration in kidney function and those at risk of eGFR falling below 45ml/min/1.73-m², <strong>Hepatic or Cardiac Impairment</strong> The benefits of metformin therapy should be discussed with a patient with mild to moderate liver dysfunction or cardiac impairment so that due consideration can be given to the cardiovascular-protective effects of the drug.</td>
</tr>
</tbody>
</table>

Refer to individual product SPC’s available at [www.hpra.ie](http://www.hpra.ie) for full prescribing information.
Table 5: Medications recommended for people who have difficulty meeting the IFCC/HbA1c agreed targets

<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Expected ↓ HbA1c mmol/mol (%)</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other therapy – Sulphonylurea –</strong></td>
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</tr>
<tr>
<td>Stimulate insulin secretion</td>
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<td></td>
</tr>
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<td>Medications in this class include:</td>
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<td></td>
</tr>
<tr>
<td>Gliclazide</td>
<td>11-22 mmol/mol (1.0-2.0%)</td>
<td>Effective</td>
<td>Educate the person about the risk of hypoglycaemia particularly if they have with hepatic cirrhosis or renal impairment May cause weight gain May accelerate beta cell failure. Educate on safe driving</td>
</tr>
<tr>
<td>Glimepiride; Glipizide</td>
<td></td>
<td>Long term efficacy and safety data</td>
<td></td>
</tr>
<tr>
<td><strong>Other therapy: DPP 4 Inhibitors –</strong></td>
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<td></td>
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<tr>
<td>Work through the incretin pathway</td>
<td></td>
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<tr>
<td>Medications in this class include:</td>
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</tr>
<tr>
<td>Sitagliptin 50mg bd (in combination with metformin = Janumet); Vildagliptin 50mg bd (in combination with metformin = Eucreas); Saxagliptin 5mg once daily (in combination with metformin = Komboglyze) Linagliptin 5mg once daily (in combination with metformin = Jentadueto);</td>
<td>5.5-8.8mmol/mol (0.5-0.8 %)</td>
<td>Weight neutral No increased risk of hypoglycaemia</td>
<td>Can cause nausea, abdominal bloating, diarrhoea, immune reactions No long-term safety data Avoid use in patients with previous history of pancreatitis or medullary thyroid cancer. Educate patients on symptoms of acute pancreatitis</td>
</tr>
<tr>
<td><strong>Renal Impairment</strong></td>
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<tr>
<td>Dose adjustment with Sitagliptin and Saxagliptin</td>
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<tr>
<td>No dose adjustment with Vildagliptin or Linagliptin</td>
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<tr>
<td><strong>Hepatic impairment</strong></td>
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<td>Vildagliptin contraindicated</td>
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<tr>
<td>Sitagliptin caution in severe hepatic impairment</td>
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<td>Saxagliptin caution in moderate and contraindicated in severe hepatic impairment</td>
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<tr>
<td>Linagliptin no cautions</td>
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<tr>
<td>Saxagliptin has been associated with increased risk of heart failure in people with high cardiovascular risk</td>
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<tr>
<td>Medication type/classifications</td>
<td>Expected ↓ HbA1c mmol/mol (%)</td>
<td>Advantages of this medication</td>
<td>Potential side effects and/or notes of caution when choosing this medication</td>
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<td>-------------------------------------------------</td>
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<tr>
<td><strong>Other therapy:</strong> GLP-1 Receptor Agonists (GLP-1RA)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Given as a S/C Injection –</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medications in this class include:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exenatide 5mcg /10mcg BD; Liraglutide 0.6mg OD; Exenatide LAR 2mg Once weekly</td>
<td>5.5-11.0 mmol/mol (0.5-1.0%)</td>
<td>Weight loss</td>
<td>Nausea, bloating, diarrhoea</td>
</tr>
<tr>
<td>Dulaglutide 0.75mg/1.5mcg Once weekly</td>
<td></td>
<td>No hypoglycaemia when used as monotherapy</td>
<td>Subcutaneous injection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Licensed for combination therapy</td>
<td>Pancreatitis (rare) but avoid in patients with history of pancreatitis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dulaglutide only one licensed for monotherapy</td>
<td>Avoid in patients with history of medullary thyroid cancer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lowers glucagon levels</td>
<td>No long-term safety data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduces post-prandial hyperglycaemia</td>
<td>In combination with sulphonylurea, may need to reduce the dose of sulphonylurea to prevent hypoglycaemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delays gastric emptying</td>
<td>Liraglutide not recommended in hepatic impairment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In a recent study CV benefit was seen as a primary outcome for Liraglutide (Marso et al, 2016), Studies on CV outcomes for other agents in this group are awaited.</td>
<td>Dulaglutide only one recommended in moderate renal impairment</td>
</tr>
</tbody>
</table>
**Table 5: Medications recommended for people who have difficulty meeting the IFCC/HbA1c agreed targets**

<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Expected ↓ HbA1c mmol/mol (%)</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
</table>
| **Other therapy – Pioglitazone –** Thiazolidinedione – insulin sensitizer | Starting dose is 15mg once daily, increased to 45mg a day. Can be used in combination with metformin or sulphonylurea or insulin or DPP-4. | 5.5-15.5 mmol/mol (0.5-1.4%) | No hypoglycaemia  
Some data suggests cardiovascular benefit  
May preserve pancreatic beta cell function | Weight gain  
Fluid overload  
NOT TO BE USED IN HEART FAILURE  
Increased risk of bone fracture – avoid in patients with metabolic bone disease  
Drop in haemoglobin  
Bladder pathology – avoid in patients with history of bladder cancer  
Not recommended in hepatic impairment |
| **Other therapy – Acarbose**  
Alpha-Glucosidase Inhibitor | 5.5- 8.8mmol/mol (0.5-0.8 %) | No hypoglycaemia  
Reduce post-prandial hyperglycaemia  
Small reduction in HbA1c when compared to other therapies | Significant GI upset limits use  
Flatulence  
Diarrhoea |
| **Other therapy – Meglitinides**  
Stimulate insulin secretion, act on the same β cell receptor as Sulphonylureas  
Repaglinide | 5.5- 16.5mmol/mol (0.5-1.5%) | Reduce post prandial hyperglycaemia | Hypoglycaemia  
Weight gain |
<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Expected ↓ HbA1c mmol/mol (%)</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other therapy- Sodium Glucose Co-Transporter 2 (SGLT2) inhibitors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce renal glucose reabsorption and increase urinary glucose excretion.</td>
<td>5.5-8.8 mmol/mol (0.5-0.8 %)</td>
<td>No hypoglycaemia Small weight loss Preserves pancreatic beta cell function Licensed for monotherapy in metformin intolerant patients Licensed as combination therapy Empagliflozin shows CV/HF benefit</td>
<td>Increased Diuresis associated with a modest decrease in blood pressure. Increased risk of urinary tract infections Urine tests glucose positive Increases LDL cholesterol Not recommended for patients receiving loop diuretics or who are volume depleted due to acute illness No long-term safety data</td>
</tr>
<tr>
<td>Canagliflozin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empagliflozin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dabagliflozin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Insulin</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Insulin</td>
<td>16.5 – 38.5 mmol/mol (1.5-3.5%)</td>
<td>Rapidly effective Improves lipid profile</td>
<td>Hypoglycaemia (Less with analogues) Weight gain</td>
</tr>
<tr>
<td>Insulin analogues (aspart, lispro, glargine, detemir, glulisine)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Medications recommended for people who have difficulty meeting the IFCC/HbA1c agreed targets
Table 6: Treatment algorithm for the management of Type 2 diabetes

**Initiation of lifestyle interventions**

Refer to structured education programme

**Metformin (with active dose titration)**
If metformin is contraindicated or patient intolerant refer to algorithm on page 2

- **Metformin + Gliclazide**
  - Efficacy (↓HbA₁c): high
  - Hypoglycaemia: moderate
  - Weight: gain (1.5-2kg)
  - Side effects: hypoglycaemia
  - Cost (£): low

- **Metformin + DPP-4 inhibitor**
  - Efficacy (↓HbA₁c): mid
  - Hypoglycaemia: low
  - Weight: neutral
  - Side effects*: rare
  - Cost (£): high

- **Metformin + SGLT2 inhibitor**
  - Efficacy (↓HbA₁c): low
  - Hypoglycaemia: low
  - Weight: loss (~0.5kg)
  - Side effects*: GI
  - Infections, dehydration
  - HF, fractures
  - Cost (£): high

- **Metformin + Pioglitazone**
  - Efficacy (↓HbA₁c): high
  - Hypoglycaemia: low
  - Weight: gain (~1-3kg)
  - Side effects*: GI
  - Cost (£): high

- **Metformin + GLP-1 agonist**
  - Efficacy (↓HbA₁c): highest
  - Hypoglycaemia: high
  - Weight: gain (~4-5kg)
  - Side effects: hypoglycaemia
  - Cost (£): variable

- **Metformin + Insulin*** (usually basal)
  - Efficacy (↓HbA₁c): high, ↓CV events
  - Hypoglycaemia: low
  - Weight: neutral/loss (~0-5kg)
  - Side effects: GI. See notes re lactic acidosis and renal impairment
  - Cost (£): low

**Initial therapy**

- **Initial therapy**
- **Dual therapy**
  - Metformin + Gliclazide
  - Metformin + DPP-4 inhibitor
  - Metformin + SGLT2 inhibitor**
- **Triple therapy**
  - Metformin + Pioglitazone
  - Metformin + GLP-1 agonist**
  - Metformin + Insulin***

**More complex insulin strategies**

- **Insulin (multiple daily doses)**
  - Efficacy (↓HbA₁c): highest
  - Hypoglycaemia: highest
  - Weight: gain (~4-5kg)
  - Side effects: hypoglycaemia
  - Cost (£): variable

If HbA₁c target not achieved after ~3 months at maximum tolerated dose, proceed to dual therapy (order not intended to denote preference-choose according to patient- and disease-specific factors). NB. Combination tablets not recommended. Consider beginning at this stage if very high HbA₁c (eg. ≥ 75 mmol/mol)

If HbA₁c target not achieved after ~3 months at maximum tolerated dose, proceed to triple therapy (order not intended to denote preference-choose according to patient- and disease-specific factors)

If HbA₁c target (and weight loss target for patients on GLP-1 agonists) not achieved after 3-6 months at maximum tolerated dose, proceed to a more complex insulin strategy, usually in combination with one or two non-insulin agents Refer to secondary care

* Side effect profile still being established
**GLP-1 agonists & SGLT2 inhibitors should be initiated in line with NICE TAs- see medicine notes
***Consider referral to structured education programme for patients initiated on insulin
Table 7: Algorithm for treatment of patient with Type 2 diabetes where Metformin Not tolerated/Contraindicated

- **Initiation of lifestyle interventions**
- **Refer to structured education programme**
- **Metformin contraindicated or not tolerated?**
  - **Yes**
    - **Gliclazide**
      - Efficacy (↓HbA$_1c$): high
      - Hypoglycaemia: mod (due to gliclazide)
      - Weight: gain (~1.5-2kg)
      - Side effects: hypoglycaemia
      - Cost (£): low

- **Refer to algorithm on page 1**

If HbA$_1c$ target not achieved after ~3 months at maximum tolerated dose, proceed to dual therapy (order not intended to denote preference-choose according to patient- and disease-specific factors). Consider beginning at this stage if very high HbA$_1c$ (eg. ≥ 75 mmol/mol)

- **Insulin**
  - Efficacy (↓HbA$_1c$): highest
  - Hypoglycaemia: high
  - Weight: gain (~4-5kg)
  - Side effects: hypoglycaemia
  - Cost (£): variable

Refer to secondary care

*Note: effect profile still being established
**GLP-1 agonists & SGLT2 inhibitors should be initiated in line with NICE TAs- see medicine notes
***Consider referral to structured education programme for patients initiated on insulin

If HbA$_1c$ target not achieved after ~3 months at maximum tolerated dose, proceed to insulin.

More complex insulin strategies

Insulin (multiple daily doses)**
Tight control of blood pressure reduces diabetes-related micro- and macrovascular complications and is central to the overall management of diabetes.

**Targets**

Target blood pressure for most people with Type 2 diabetes should be:
- systolic blood pressure of ≤ 140mmHg; and
- a diastolic blood pressure of ≤ 80mmHg.

Lower systolic targets, such as < 130mmHg may be appropriate for certain individuals such as younger patients, if it can be achieved without undue treatment burden.

Based on patient characteristics, age, the presence or absence of renal disease, eye or cerebrovascular damage and response to therapy, higher or lower systolic blood pressure targets may be appropriate.

Targets should be set in consultation with the individual. These targets should be seen as guides as a person’s individual circumstances need to be considered when setting and agreeing targets (American Diabetes Association, Clinical Practice Recommendations 2016; National Institute for Clinical Excellence 2015).

**Clinical monitoring**

- Blood pressure should be checked at each clinic visit.
- If blood pressure is high, consider 24 hour blood pressure monitoring to confirm diagnosis

**Treatment**

**Non-pharmacotherapy**

The patient should be educated:
- to eat a low-salt diet;
- to reduce alcohol intake; and
- that exercise and weight loss are beneficial in reducing blood pressure

**Pharmacotherapy**

See Table 8: Pharmacotherapy – medications, advantages, disadvantages and cautions
**Resistant blood pressure**

People with Type 2 diabetes frequently have refractory or resistant hypertension despite the use of 3 or 4 blood pressure agents. If this is the case, seek expert advice from a consultant endocrinologist as per National Model of Integrated Care.

To improve medication adherence, aim for once daily blood pressure medication dosing.

**See Table 9: Algorithm for treatment of people with high blood pressure and Type 2 diabetes,** at the end of this chapter.

**Areas to audit**

Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to people with Type 2 diabetes are:

- frequency of checking a person’s blood pressure;
- evidence of intervention taken, either pharmacotherapy or non-pharmacotherapy, in patients who are not meeting blood pressure targets;
- prevalence of hypertension in Type 2 diabetes;
- checking that people with diabetes and hypertension are treated as per guidelines; and
- achieving target blood pressure in people with type 2 diabetes.

**Chapter 10: Tables**

**Table 8:** Pharmacotherapy – medications, advantages, disadvantages and cautions

**Table 9:** Algorithm for treatment of people with high blood pressure and Type 2 diabetes
Table 8: Pharmacotherapy: medication, advantages, disadvantages and cautions

<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
</table>
| First line therapy - ACE Inhibitors (ACE-I) Vasodilators | • Effective blood pressure lowering agents  
• Reno-protective effect  
• Reduce cardiovascular morbidity and mortality  
• Long term data available for its efficacy | **Cautions**  
In patients with renal failure - check U&E after two weeks  
Renal artery stenosis, peripheral vascular disease, angioedema  
Teratogenic – do not use in patients planning pregnancy.  
**Side effects**  
Angioedema, hyperkalaemia, renal impairment, rash, cough (change to ARB) |
| First line therapy - angiotensin receptor blockers (ARB) Vasodilators | • Effective blood pressure lowering agents  
• Reno-protective effect  
• Reduce cardiovascular morbidity and mortality  
• Long term data available for its efficacy | **Cautions**  
In patients with renal failure - check U&E after two weeks  
Renal artery stenosis  
Aortic artery stenosis  
Aortic and mitral valve stenosis  
Teratogenic – do not use in patients planning pregnancy  
**Side effects**  
Angioedema, hyperkalaemia, symptomatic hypotension |
| Second line therapy – calcium channel blocker Vasodilators | • Effective blood pressure lowering agents  
• Reduce cardiovascular morbidity and mortality  
• Long term data available for its efficacy | • Leg oedema  
• Constipation  
• Headache |
<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
</table>
| **Second line therapy – Diuretic therapy (thiazide diuretic)** Diuretic Natriuresis | • Effective blood pressure lowering agents  
• Reduce cardiovascular morbidity and mortality  
• Long term data available for its efficacy | **Contraindications**  
Addisons disease, refractory electrolyte disturbances  

**Cautions**  
Avoid high dose thiazide diuretic such as bendrofluazide 5mg due to risk of hyperglycaemia  
Caution in elderly patients with low BMI – increased risk of hyponatraemia  

**Side Effects**  
Hyponatraemia, dehydration, gout, hyperkalaemia, hypomagnesia, hypercalcaemia, hyperuricaemia. |
| **Third Line Therapy Beta- Blockers** Reduce heart rate  
Reduce myocardial contractility  
Cardio-selective beta blockers should be used for example atenolol, bisoprolol, metoprolol, nebivolol | • Effective blood pressure lowering agents  
• Reduce cardiovascular morbidity and mortality  
• Long term data available for its efficacy  
**Beta-blockers should be used as first line BP agents in patients with co-existing angina** | • Bradycardia  
• Fatigue  
• Cold peripheries  
• Dizziness |
| **Fourth line therapy Aldosterone antagonist** e.g. eplerenone or spironolactone Diuretic Block the action of aldosterone | Lowers blood pressure | **Contraindications**  
Pre-existing hyperkaleamia  

**Caution**  
High risk hyperkalaemia if used in combination with ACE1 or ARB  

**Side effects**  
Hyperkalaemia, dehydration, hyponatraemia, gynaecomastia, GI disturbances, dizziness |
| **Fourth Line Therapy – alpha Blocker e.g., doxazosin XL** Vasodilator | • Lower blood pressure  
• Safe to prescribe in renal failure | • Dizziness  
• Postural hypotension  
• Increased urinary frequency |
### Table 8: Pharmacotherapy: medication, advantages, disadvantages and cautions

<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aliskerin</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The rennin antagonist (aliskerin) has recently been associated with a high risk of hyperkalaemia and increased risk of non fatal stroke in patients with diabetes (Parving HH et al, 2012). So it is currently not recommended as a routine blood pressure treatment for patients with type 2 diabetes and <strong>should NOT be prescribed in combination with:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• angiotension-converting enzyme inhibitors (ACE-1) and angiotension receptor blockers (ARB) or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• with an eGFR of ≤ 60ml/min</td>
</tr>
<tr>
<td><strong>ACE-I and ARB combined</strong></td>
<td></td>
<td>Combination treatment of an ACE-I and ARB is associated with a high risk of hyperkalaemia and increase risk of renal dysfunction. Therefore combination therapy of an ACE-I or ARB should be used with caution and under supervision of a specialist with regular monitoring of the urea and electrolytes (Yusuf et al 2012).</td>
</tr>
<tr>
<td>ACE-I and ARB are teratogenic, therefore in people with Type 2 diabetes planning pregnancy please refer to secondary care for specialist opinion (see Chapter 13: pre-pregnancy care (Hanssens M 2008))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Black patients the first line treatment for blood pressure is ACE-I in combination with a calcium channel blocker or a thiazide diuretic (do not use ACE-I on its own (American Diabetes Association, Clinical Practice Guidelines 2013))</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9: Treatment of People with High Blood Pressure and Type 2 Diabetes

Start ACE Inhibitor
(If cough or other side effects on ACEI switch to Angiotensin Receptor Blocker)

Blood Pressure Remains above target then introduce extra BP lowering medications in a step-wise fashion. See options 1, 2 & 3. Choose Option 3 in patients with Angina or following MI

Option 1
Calcium Channel Blocker
If still not meeting BP target add in thiazide diuretic (combination tablets with ACEI and ARB available)
If still not meeting BP target add in beta blocker

Option 2
Add in thiazide diuretic (combination tablets with ACEI and ARB available)
If still not meeting BP target add in Calcium Channel Blocker
If still not meeting BP target add in beta blocker

Option 3 – For Patients with Angina or following MI
Add in beta blocker
If still not meeting BP target add in Calcium Channel Blocker
If still not meeting BP target add in thiazide diuretic (combination tablets with ACEI and ARB available)

Ask for expert opinion from secondary care
Consider addition of
1. Alpha-Blocker or
2. Aldosterone Anagagonist or
3. Use of combination ACEI or ARB (use with caution)
Dyslipidaemia is commonly present in patients with Type 2 diabetes. An increased concentration of LDL cholesterol and of total cholesterol is an independent risk factor for cardiovascular morbidity and mortality. A 1.0mmol/l reduction of LDL cholesterol represents a 21% reduction in risk of CVD and a 9% reduction in risk of death from any cause among patients with diabetes (Kizer JR et al 2003).

**Cholesterol targets**

In patients without overt CVD all patients who are over the age of 40 years and who have one or more other CV risk factor should be on a statin with the primary target of a LDL cholesterol of ≤ 2.5mmol/l (American Diabetes Association, Clinical Practice Recommendations 2016; Scottish Intercollegiate Guidelines Network 2010; National Institute for Clinical Excellence 2015).

In patients with overt cardiovascular disease (CVD) all patients should be on a statin with the primary target of a LDL cholesterol of ≤ 1.8mmol/l (American Diabetes Association, Clinical Practice Recommendations 2016; Scottish Intercollegiate Guidelines Network 2010; National Institute for Clinical Excellence 2015).

Targets should be set in consultation with the patient. If the target LDL cholesterol is not reached on maximally tolerated statin therapy, a reduction in LDL cholesterol of >30-40% from baseline can be used as an alternative therapeutic target (American Diabetes Association, Clinical Practice Recommendations 2013; Scottish Intercollegiate Guidelines Network 2010; National Institute for Clinical Excellence 2009).

**Clinical monitoring**

If patient is above the LDL cholesterol target, check lipid profile every four months in response to changes in lipid-lowering therapy until patient is stable and within target.

Once patient is stable, within target and on treatment, the lipid profile can be checked annually.

**Treatment**

**Non-pharmacotherapy**

It may improve the lipid profile in patients with diabetes if they:

- reduce saturated fat, trans fat and cholesterol intake;
- lose weight;
- stop smoking; and
- increase physical activity.
See Table 10: Pharmacotherapy treatment for cholesterol

Audit suggestions
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to patients with Type 2 diabetes are to check:

- the frequency of checking a person’s lipid profile;
- evidence of intervention taken, either pharmacotherapy or non-pharmacotherapy, in patients who are not meeting lipid target;
- prevalence of dyslipidaemia in Type 2 diabetes;
- if the target lipid profile is achieved in Type 2 diabetes; and
- adherence to statin therapy.

Chapter 11: Tables

Table 10: Pharmacotherapy treatment for cholesterol

Table 11: Algorithm of treatment of cholesterol in patients with Type 2 diabetes
## Table 10: Pharmacotherapy treatment for cholesterol

<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First line therapy—statins:</strong></td>
<td>• Effective lipid lowering agents</td>
<td>• Contraindications</td>
</tr>
<tr>
<td>• Simvastatin (max dose 40mg)</td>
<td>• Shown to reduce CV morbidity and mortality in patients with diabetes</td>
<td>Active liver disease, elevation of serum transaminases &gt; 3 times upper normal limit of normal, pregnancy and lactation</td>
</tr>
<tr>
<td>• Atorvastatin</td>
<td></td>
<td><strong>Simvastatin contraindications</strong>  Concomitant administration of potent CYP3A4 inhibitors, for example clarithromycin, fluconazole (see SPC)</td>
</tr>
</tbody>
</table>

**Start at low dose and increase at each 4 monthly clinic visit to achieve target LDL cholesterol**

Both agents are proven in diabetes but simvastatin is the first line treatment due to its cost effectiveness over atorvastatin

Advises the patient to take the medication at bedtime but if compliance is an issue switch to morning administration

**Laboratory monitoring**

Perform baseline LFTs and at 3 months and 12 months

Check CK if risk factors as per SPC

**Add on therapies** — may be considered to achieve lipid targets but are not currently proven to reduce CV morbidity and mortality. Consider add on therapy if after 4 months on maximum dose statin lipid targets not achieved.
<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
</table>
| **Ezetimibe**                  | Reduce LDL cholesterol by 15-20%. | **Interactions:** Ciclosporin, monitor levels, Warfarin, may increase INR - monitor  
| Dose of 10mg a day.            |                                | **Side effects:** myopathy, leg cramps, fatigue, abdominal pain, diarrhea and flatulence |
| Can be prescribed in combination with simvastatin. |                                |                                                                                      |
| **Fibrates – seek expert advice** | Reduce LDL cholesterol by approximately 5% | **Contraindications** Genfibrozil is CI with repaglinide  
| • Fenofibrate                  | More effective at reducing serum triglycerides | Hepatic impairment, renal impairment, gallstones, pancreatitis, photoallergy  
| • Gemfibrozil                  |                                | **Caution** Increased risk of muscle damage when used with statins. Monitor CK and LFTs. Side Effects Nausea, myositis, abnormal LFTs rhabdomyolysis |
| **Bile acid sequestrant – Colesevelem** | Use as monotherapy or in combination with statin or ezetimibe | **Cautions** Triglyceride level $> 3.4\text{mmol/L}$, constipation  
| 625mg per tablet – take 4 to 6 per day with food | Reduce LDL cholesterol by 15-20% | **Interactions** Warfarin- monitor INR closely  
|                                | Increase HDL by 2-3% | Give at least four hours after levothyroxine, oral contraceptive pill and  
|                                | Can increase triglycerides – use with caution in patients with high triglycerides (seek expert opinion) | urosodeoxycholine acid  
|                                | Can improve blood glucose levels | Ciclosporin – monitor blood levels closely, give coloesevelam four hours after ciclosporin  
|                                |                                | **Side effects** Flatulence, constipation, diarrhea, headache, dysphagia, increase triglycerides, nausea, abnormal stools, dyspepsia |
Table 10: Pharmacotherapy treatment for cholesterol

<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Advantages of this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other cautions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• If a patient develops symptoms on statin therapy, stop statin and then re-challenge with alternative statin at low dose and titrate slowly as tolerated by patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Simvastatin at a dose of 80mg should not be prescribed (risk of myopathy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• If patient cannot tolerate any statin therapy, consider alternative lipid lowering agent – seek expert advice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Intensive lipid lowering therapy with atorvastatin 80mg should be considered in patients with diabetes and acute coronary syndrome or following coronary revascularization procedures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Statin therapy is contraindicated in pregnancy (American Diabetes Association, Clinical Practice Recommendations 2016; Scottish Intercollegiate guidelines Network, 2010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Patients with well controlled Type 2 diabetes and fasting hypertriglyceridemia &gt;4.5mmol/L should be considered for fibrate therapy in addition to statin treatment – seek expert advice pregnancy (American Diabetes Association, Clinical Practice Recommendations 2016, Keech A et al, 2005) – seek expert advice.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See Table 11: Algorithm of treatment of cholesterol in patients with Type 2 diabetes, for a guide to medication management of cholesterol in type 2 diabetes
**Table 11: Treatment of Cholesterol in Patients with Type 2 Diabetes**

**Start Statin Therapy**

Simvastatin or Atorvastatin

- Increase statin therapy 4-monthly to maximum tolerated dose to achieve LDL cholesterol
- Failure to achieve target LDL cholesterol on max dose statin for at least 4 months
  - Option 1: Switch to alternative statin
    - Atorvastatin 40mg daily
    - Rosuvastatin 20mg daily
    - Increase dose of either agent 4 monthly to max tolerated dose
  - Option 2: Add in second agent
    - Add in Ezetimibe 10mg daily

- Intolerant of statin therapy
  - Start Ezetimibe 10mg daily
  - Add in Ezetimibe 10mg daily
  - If still not meeting lipid target consider nicotinic acid or fibrate or colesevelam therapy – ask for specialist help

- If still not meeting lipid target consider nicotinic acid or fibrate or colesevelam therapy – ask for specialist help

**Ask for expert opinion**

- 4. LDL cholesterol still not in target despite following treatment algorithm and on agents for at least 4 months
- 5. Severe fasting hypertriglyceridemia (>4.5mmol/l) in the setting of good glucose control
- 6. Vascular events despite achieving target LDL cholesterol levels on statin therapy
Chapter 12
Anti-platelet Therapy in Type 2 diabetes

Type 2 diabetes is associated with an increased risk of cardiovascular and cerebrovascular events. Aspirin has been shown to be effective in reducing cardiovascular morbidity and mortality in high-risk patients with previous MI or stroke (secondary prevention), but it should not be prescribed to patients with Type 2 diabetes (primary prevention) without cardiovascular disease (American Diabetes Association, Clinical Practice Recommendations 2016; Scottish Intercollegiate Guidelines Network 2010; National Institute for Clinical Excellence 2015).

Table 12: Anti-platelet therapy in Type 2 diabetes

Refer to drug SPC (summary of product characteristics) for full list of side effects and drug interactions.

<table>
<thead>
<tr>
<th>Does this patient have a history of cardio or cardiovascular disease?</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

Aspirin should not be prescribed in
- Men or women aged < 50 years with no major additional atherosclerotic cardiovascular disease risk factors, as the potential adverse effects from bleeding likely offset the potential benefits

Aspirin (75-150mg/day) should be prescribed in
- Men or women with diabetes aged ≥ 50 years with at least one additional major risk factor - family history of premature atherosclerotic cardiovascular disease, hypertension, smoking, dyslipidemia, or albuminuria
- Are not at increased risk of bleeding

For people with diabetes <50 years of age with multiple other risk factors, clinical judgment is required
**Aspirin intolerance**
Clopidogrel (75mg/day) should be used instead of aspirin only in those with clear aspirin intolerance and aspirin allergy.

**Combination therapy**
Combination therapy with aspirin (75mg/day) and clopidogrel (75mg/day) is reasonable for up to 12 months after an acute coronary syndrome. Combination therapy for 12 months is required in all patients with diabetes post insertion of a drug-eluting coronary artery stent.

**Auditing anti-platelet therapy**
Suggested areas for auditing anti-platelet therapy in line with the principle of continuous improvement in the services delivered to patients with Type 2 diabetes are checking:

- the number of people on aspirin who have Type 2 diabetes and also have a history of cardio or cerebrovascular disease; evidence that people with Type 2 diabetes who meet any of the criteria listed above have been offered aspirin;
- the number of smokers on aspirin with Type 2 diabetes;
- the number of people on aspirin for secondary prevention;
- the number of people on aspirin for primary prevention; and
- evidence that patients with acute coronary syndrome have been reviewed after 12 months of combination anti-platelet therapy
Chapter 13

Diabetic Retinopathy

Diabetic retinopathy is one of the most common causes of blindness in the working age population in Ireland and is one of the most common serious complications of diabetes. Up to 5% of patients with diabetes in Ireland may have sight-threatening diabetic retinopathy. This sight threatening condition is preventable by early detection, through population based screening and treatment.

The National Diabetic Retinal Screening Programme

Diabetic RetinaScreen – Which is part of the National Screening Service and Health Service Executive, is a quality assured government-funded programme that offers, free annual diabetic retinopathy screening to people with Type 1 or Type 2 diabetes aged 12 and over. The aim of the programme is to reduce the risk of sight loss among people with diabetes by the early detection and treatment of sight-threatening retinopathy.

Screening

Screening appointments last approximately 30 minutes during which dilating drops are administered to the eyes and specialised digital photographs are taken of the retina. The images are then reviewed and subsequently graded. If the images taken show that further investigation and treatment is required, the participant will be referred to a Diabetic RetinaScreen treatment clinic, however most participants will have a normal result and will be re-invited for annual screening.

Treatment

Treatment for screen positive patients is delivered in one of the seven treatment clinics nationally. Treatment is delivered in line with Clinical Practice Guidelines for Treatment Clinics.

A result letter will be sent within three weeks after the screening appointment advising of the next steps. Most people will have a normal result. They will have no retinopathy or will have early changes to their retina and will be invited back for routine diabetic retinopathy eye screening.

Patients will be contacted for a further appointment if:

- The photographs are not clear enough to give a result.
- You have diabetic retinopathy which needs to be assessed.
- Other eye conditions not caused by diabetes are detected and need to be assessed.

Follow up or further assessments of diabetic retinopathy that are recommended as part of the screening programme are free of charge.
Management of Diabetic Nephropathy

Definition
Diabetic renal disease is a glomerular disorder characterised by structural and functional changes, which may lead to proteinuria and/or decline in kidney function. It may be progressive and result in end-stage renal disease, which may require renal replacement therapy (dialysis or transplantation) (Waas JH, Shalet SM 2002).

Microalbuminuria is defined as a urine albumin to creatinine ratio (ACR) of ≥ 3.5mg/mmol in females or ≥ 2.5mg/mmol in males, which corresponds to a 24-hour urinary protein excretion of 30-300mg. It has been shown to be predictive of all-cause and cardiovascular mortality, independent of traditional risk factors (Gerstein et al 2001). It may also reflect subclinical vascular damage in the kidneys and other vascular beds. Treatment may reduce cardiovascular and/or renal morbidity and mortality.

Macroalbuminuria is defined as a urine ACR of ≥ 35mg/mmol in females or ≥ 25mg/mmol in males and corresponds to a 24-hour urinary protein excretion of > 300mg. It has also been shown to be predictive of end-stage renal disease (ESRD) and cardiovascular morbidity and mortality.

Prevalence
The United Kingdom Prospective Diabetes Study (UKPDS; Adler et al 2003) reported that at 10 years following the diagnosis of Type 2 diabetes mellitus:

- the prevalence of microalbuminuria was 24.9%;
- macroalbuminuria was 5.3%; and
- an elevated serum creatinine or a requirement for dialysis in 0.8% (Waas JH, Shalet SM 2002)

Monitoring
Annual assessment (at least) with urine ACR, serum creatinine and estimated glomerular filtration rate (eGFR) is recommended.

Treatment options
Treatment should include achieving optimal:

- glycaemic control for that person;
- lipid control;
- blood pressure control – including treatment with an angiotensin converting enzyme inhibitor (ACE-I) or an angiotensin receptor blocker (ARB).
ACE-I or ARB therapy

Randomised controlled clinical trials have shown ACE-inhibitors (Lewis EJ et al 1993; Patel A et al 2007) and ARB (Evans M et al 2011) are:

- both effective in reducing proteinuria and/or progressive decline in eGFR; and
- ACE-I and ARB are equally effective (Barnett A, 2006).

The ONTARGET study showed that although combination therapy with telmisartan and ramipril reduced proteinuria to a greater extent than monotherapy, overall it was associated with worse renal outcomes. This means combination therapy is not recommended (Mann JF et al 2008; Harkins 2016). Instead, the dose of ACE-I or ARB should be escalated to maximum dose, which if tolerated, is associated with best outcome.

The use of ACE-I or ARB is contraindicated during pregnancy (Hanssens M 2008) and any premenopausal woman should be counseled on the risks and use an appropriate contraceptive method. Those contemplating pregnancy should be switched to an alternative class of blood pressure lowering drug, which is safe to use in pregnancy – refer to specialist pre-pregnancy clinic in secondary or tertiary care centre.

eGFR, serum creatinine and serum potassium levels should be checked prior to and within two weeks of initiation or increase in dose of ACE-I or ARB. A decrease of ≤ 15% in eGFR may occur with the commencement of ACE-I or ARB and ought not to prompt discontinuation of the drug.

As both ACE-I and ARB are effective in reducing albuminuria, patients with progressive decline in eGFR, but who have normal urine ACR are still likely to have an underlying diagnosis of diabetic nephropathy.

Targets

- Blood pressure ≤ 130/80mmHg.
- Improvement or stability of eGFR.
- Regression or reversal of proteinuria.
- Prevent progression to end-stage renal disease.

Suggested audit

- Prevalence of diabetic nephropathy.
- Proportion of patients who are achieving targets with treatment.
- Rates of progression of nephropathy up to and including end-stage renal disease.

See Table 13: Algorithm: Guidelines for evaluation of diabetic renal disease

This algorithm can be used to guide the assessment and management of renal disease in patients with Type 2 diabetes.

This document was prepared after reviewing the literature for guidelines on the evaluation of diabetic nephropathy and is predominantly based on a guideline provided by the National Institute

In patients with diabetic renal disease, necessary dietary and lifestyle changes are required to slow the progression of the renal disease. The Irish Nutrition and Dietetic Institute Renal Interest Group recommend that the dietary advice should depend on the stage of the renal disease, based on estimation of the eGFR, using the MDRD equation. To calculate see: http://egfrcalc.renal.org/

See Table 14: Renal disease and diabetes; and Table 15: Diet modification in renal disease

Chapter 14: Tables

Table 13: Algorithm: Guidelines for evaluation of diabetic renal disease

Table 14: Stages of Chronic Kidney Disease and nutrition advice

Table 15: Diet modification in renal disease
**Table 13: Algorithm: Guidelines for evaluation of diabetic renal disease**

- **Annual eGFR & ACR**

  - **eGFR > 60 ml/min/1.73 m²**
    - Measure ACR
    - **ACR > 2.5 mg/mmol (men)**
    - **ACR < 2.5 mg/mmol (men)**
    - **ACR < 0.5 mg/mmol (women)**
    - Suspicion of non-diabetic renal disease?
      - Nephrotic range proteinuria?
      - Rapid deterioration in renal function?
    - Yes
      - Presumptive Diagnosis of Diabetic Nephropathy
    - No
      - Difficult to control Hypertension
      - Add/Increase/Maximise dose of ACE-i or ARB
        - **Treat to Target:**
          - Hypertension
          - HbA1c
          - Hyperlipidaemia
      - Routine Care

  - **eGFR 30-59 ml/min/1.73 m²**
    - Measure ACR
    - **ACR > 2.5 mg/mmol (men)**
    - **ACR < 2.5 mg/mmol (men)**
    - **ACR < 0.5 mg/mmol (women)**
    - If not on ACE-i/ARB
      - **Less likely to Represent Diabetic Nephropathy**
      - **Consider Nephrology Referral***

  - **eGFR <= 30 ml/min/1.73 m²**
    - Measure ACR
    - **ACR > 2.5 mg/mmol (men)**
    - **ACR < 2.5 mg/mmol (men)**
    - **ACR < 3.5 mg/mmol (women)**
    - Measure ACR
    - **eGFR > 60 ml/min/1.73 m²**
    - **eGFR 30-59 ml/min/1.73 m²**
    - **eGFR <= 30 ml/min/1.73 m²**

---

*Exceptions:*
1. Elderly patient with stable non-proteinuric renal disease
2. Middle aged women with stable GFR 55-65 ml/min/1.73 m²

The Irish Nephrology Society is preparing CKD guidelines, which will include more specific advice on which patients should be referred for specialist renal opinion.
## Table 14: Stages of Chronic Kidney Disease and Nutrition Advice

<table>
<thead>
<tr>
<th>Stage</th>
<th>GFR*</th>
<th>Description</th>
<th>Treatment stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90+</td>
<td>Normal kidney function but urine findings or structural abnormalities or genetic trait point to kidney disease</td>
<td>Observation, control of blood pressure.</td>
</tr>
<tr>
<td>2</td>
<td>60-89</td>
<td>Mildly reduced kidney function, and other findings (as for stage 1) point to kidney disease</td>
<td>Observation, control of blood pressure and risk factors.</td>
</tr>
<tr>
<td>3A</td>
<td>45-59</td>
<td>Moderately reduced kidney function</td>
<td>Observation, control of blood pressure and risk factors</td>
</tr>
<tr>
<td>3B</td>
<td>30-44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>15-29</td>
<td>Severely reduced kidney function</td>
<td>Planning for endstage renal failure</td>
</tr>
<tr>
<td>5</td>
<td>&lt;15 or on dialysis</td>
<td>Very severe, or endstage kidney failure (sometimes call established renal failure)</td>
<td>Treatment choices</td>
</tr>
</tbody>
</table>

### Stages of CKD and diet

<table>
<thead>
<tr>
<th>CKD stage</th>
<th>Dietary treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• No added salt</td>
</tr>
<tr>
<td></td>
<td>• Address co-morbidities e.g. weight, diabetes and lipids</td>
</tr>
<tr>
<td>2</td>
<td>• No added salt</td>
</tr>
<tr>
<td></td>
<td>• Address co-morbidities e.g. weight, diabetes and lipids</td>
</tr>
<tr>
<td>3</td>
<td>• No added salt</td>
</tr>
<tr>
<td></td>
<td>• Restrict protein intake</td>
</tr>
<tr>
<td></td>
<td>• Phosphate and potassium restriction as required</td>
</tr>
<tr>
<td>4</td>
<td>• No added salt</td>
</tr>
<tr>
<td></td>
<td>• Protein, phosphate and potassium restriction</td>
</tr>
<tr>
<td>5</td>
<td>• Renal replacement therapy</td>
</tr>
<tr>
<td></td>
<td>• Advice as per therapy choice</td>
</tr>
</tbody>
</table>

*The Irish Nutrition and Dietetic Institute Renal Interest group recommend that dietary advice should depend on the stage of the renal disease, based on estimation of the eGFR, using MDRD equation. This table represents general recommendations – individual care plans will be based on unique nutritional and biochemical assessments.*
<table>
<thead>
<tr>
<th>Dietary component</th>
<th>Conservative management requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>30-35 Kcal/Kg IBW/day*</td>
</tr>
<tr>
<td>Protein</td>
<td>0.8-1.0g/Kg IBW/ day *</td>
</tr>
<tr>
<td>Salt</td>
<td>80-100 mmol/day</td>
</tr>
<tr>
<td>Potassium</td>
<td>1mmol/kg IBW/day*</td>
</tr>
<tr>
<td>Phosphate</td>
<td>&lt;15mg/g protein</td>
</tr>
<tr>
<td>Fluid</td>
<td>Restrict if necessary</td>
</tr>
</tbody>
</table>

*Use ideal Body Weight(IBW)
If BMI 20-25, use actual weight
If BMI >25, use BMI 25
If BMI <20, Use BMI 20
Chapter 15
Management of the Diabetic Foot

Diabetic foot disease is one of the most feared and costly complications of Type 2 diabetes. People with Type 2 diabetes are at increased risk of foot ulceration and lower-limb amputation.

Incidence
The annual risk of foot ulceration is 2.2% -7.0% in people with diabetes (Jeffcoat WJ, Harding KG, 2003). People with diabetes have a 10 to 20-fold increased risk of lower-limb amputation compared to non-diabetic people (Abbott CA et al 2002).

Monitoring
Everyone with diabetes should have their foot examined at each clinic visit as per the national model of foot care (National Diabetes Programme, 2012).

See Appendix 18: Guidelines of what should occur in a foot examination with a person with diabetes

Classification of risk
People with diabetes should have their feet examined and classified according to their risk of foot disease:
- Low, medium, high or active foot disease.

See Appendix 19: Categories of risk of diabetic foot problems

Referral of patients
Active foot disease should be referred to the hospital diabetes multidisciplinary foot protection team/specialist foot service and be seen within 24hrs or the next working day.

High-risk foot patients should be referred to the hospital diabetes multidisciplinary foot protection team/specialist foot service.

Moderate risk patients should be referred to the podiatrist either in the community or in the hospital diabetes foot protection team/specialist foot service.

Low-risk patients should have their foot examined at each clinic visit by the practice nurse and/or GP.

See the HSE website for the ‘Model of Care for the Diabetic Foot’, http://www.hse.ie/eng/about/Who/clinical/natclinprog/modelofcarediabetes.pdf

See Table 16: Management-care pathway for people with diabetic foot disease.
Auditing suggestions
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to people with Type 2 diabetes are evidence that:

- each person with diabetes has had a foot screening and that their risk of developing diabetic foot-care problems has been identified;
- the patient’s treatment is in line with their level of risk as classified by the National Model of Foot Care;
- patients have been referred appropriately according to risk classification as per National Model of Foot Care; and
- people with active foot disease are seen within the appropriate timeframe by the foot protection team or specialist foot service within secondary care.

Chapter 15: Tables and appendices

Table 16: Management-care pathway for people with diabetic foot disease

Appendix 18: Guidelines of what should occur in a foot examination with a person with diabetes

Appendix 19: Categories of risk of diabetic foot problems
**Table 16: Management-care pathway for people with diabetic foot disease**

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Moderate Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>High Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Active Foot Disease</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Clinical Findings**
- Normal sensation
- Intact pressure and vibration sensation
- No Peripheral Arterial Disease (PAD)
- All pedal pulses present
- No signs or symptoms of PAD (e.g., claudications, pallor, dependent rubor, poor tissue vitality)
- No previous ulcer or lower limb amputation
- No foot deformity
- Normal vision

**LOW RISK**
- Annual foot screening in primary care
- Practice nurse/primary care nurse to screen
- Clinical nurse specialist and/or podiatrist to provide education to practice nurse/public health nurse to provide screening
- Patient education/smoking cessation

**AT RISK**
- Annual foot examination by foot protection team and ongoing review by podiatrist member of the foot protection team based in either the hospital or the community
- Education in foot protection
- Vascular assessment, biomechanical, orthopaedic assessment and orthotics if indicated
- Referral to community podiatry for non diabetic foot pathology

**ACTIVE FOOT DISEASE**
- Called for formal annual review by foot protection team and routine ongoing review by GP/Practice nurse/hospital diabetes clinic
- Examination for deformity, neurological and vascular status and footwear and orthotics as indicated
- Education in foot protection
- If ulceration present then refer within 24 hours to multidisciplinary foot care service (model 4 hospital)

**Clinical Findings**
- PAD and sensory loss and/or previous diabetes related foot ulcer or lower limb amputation and/or previous Charcot neuroarthropathy

**Management Plan**
- Referral with rapid access (within 24 hours/next working day) to multidisciplinary foot care service in tertiary centre
- Access to vascular, orthopaedics, orthotics
- Access to vascular laboratory, radiology, microbiology, infectious disease

**Healed Ulcer**
- Once ulcer healed refer patient back to the foot care team in the referral model 3 hospital
- If the healed ulcer belongs to a patient who originated from the model 4 hospital, they remain under the care of the specialist diabetes foot service in the model 4 hospital

---

**On Diagnosis of Diabetes, and at Annual Review Thereafter:**
Trained practice nurse will examine patient’s feet and lower limbs for risk factors, this should include:
- Testing vibration and 10g monofilament sensation
- Palpation of dorsalis pedis and posterior tibial pulses in both feet
- Inspection of any foot deformity
- Inspection of footwear
Appendix 18

Appendix 18: Guidelines of what should occur in a foot examination with a person with diabetes

A trained practice nurse/GP will examine a patient’s feet and lower limbs for risk factors. The exam should include;

- Testing vibration using a tuning fork and a 10g monofilament sensation
- Palpation of dorsalis pedis and posterior tibial pulses in both feet
- Inspection of any foot deformity
- Inspection of footwear and
- checking if skin is intact
Appendix 19: Categories of risk of diabetic foot problems

The following are the definitions of risk of diabetic foot problems in patients with type 2 diabetes.

**Low risk**
The following are the clinical findings of a person deemed to be low risk of diabetic foot problems:

- Normal sensation
  - Intact pressure and vibration sensation
- No peripheral arterial disease (PAD)
  - All pedal pulses present
  - No signs or symptoms of PAD – i.e. claudication, pallor, dependent rubor, poor tissue vitality
- No previous ulcers or lower limb amputation
- No foot deformity
- Normal vision

**Moderate risk**
If any one of the following present, the patient is classified as moderate risk.

- Loss of sensation/peripheral neuropathy
- Peripheral Arterial Disease (PAD) present:
  - Absent pulses
  - Sign or symptoms of PAD – i.e. claudication pallor, dependent rubor, poor tissue vitality
  - Previous vascular surgery
- Structural foot deformity
- Significant visual impairment
- Physical disability(for example, stroke or gross obesity)

**High Risk**
The following are clinical findings of a person deemed to be high risk of diabetic foot problems:

- PAD and sensory and/or
- Previous diabetes related foot ulcer and/or
- Lower-limb amputation and/or
- Previous charcot neuroarthopathy

**Active foot disease**
The following are the clinical findings of a person deemed to have active foot disease:

- Active foot ulceration and/or
- Active charcot neuroarthopathy
Diabetic peripheral neuropathy (DPN) is one of the commonest complications of Type 2 diabetes and may be present at time of diagnosis (Waas JH, Shalet SM 2002).

Diabetes can affect all nerves and so diabetic neuropathies are heterogeneous with diverse clinical manifestations. They may also be focal or diffuse. The most common diffuse neuropathy is the chronic sensorimotor neuropathy (‘glove and stocking’) diabetic peripheral neuropathy and the most common focal neuropathy is carpal tunnel syndrome (median nerve compression).

Prevalence
DPN may be present at time of diagnosis in more than 10% of patients and may affect up to 50% of patients with long-standing diabetes. In 50% of cases, diabetic peripheral neuropathy may be asymptomatic, but for 16%-26% of patients with diabetes the neuropathy is painful (Scottish Intercollegiate Guidelines Network 2010; McIntosh A 2003)

Clinical monitoring
Patients should be examined for DPN from time of diagnosis. Their feet should be examined at each clinic visit for signs of peripheral neuropathy using a 10g monofilament and vibration perception (128 Hz tuning fork).

See Table 16: Management-care pathway for people with diabetic foot disease

Refer also to the National Model of Foot Care (National Diabetes Programme, 2012).

Diagnosis
The diagnosis of DPN is a diagnosis of exclusion, but complex investigations are rarely needed to exclude other conditions. However, consider other causes including:

- alcohol excess;
- B12 deficiency (patients on metformin);
- underlying vasculitis;
- inherited neuropathies;
- neurotoxic medications; and
- chronic inflammatory demyelinating polyneuropathy.

Treatment
The first step is to aim for stable and optimal glucose control.
See Table 17: Medication in painful diabetic peripheral neuropathy

See Table 18: Algorithm for recommended care pathway for managing painful diabetic peripheral neuropathy


Audit suggestions
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to people with Type 2 diabetes are:

• frequency of checking a patient for diabetic peripheral neuropathy (DPN);
• number of patients on oral treatment for diabetic peripheral neuropathy (DPN) who responded to treatment;
• number of patients with diabetic peripheral neuropathy (DPN) referred to diabetes service for further treatment;
• prevalence of diabetic peripheral neuropathy; and
• choice of and response to treatment.

Chapter 16: Tables

Table 17: Medication in painful diabetic peripheral neuropathy

Table 18: Algorithm for recommended care pathway for managing painful diabetic peripheral neuropathy
## Table 17: Medication in painful diabetic peripheral neuropathy

<table>
<thead>
<tr>
<th>Medication type/classifications</th>
<th>Indications for this medication</th>
<th>Potential side effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First line therapy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– amitriptyline (unlicensed indication)</td>
<td>• Relieves pain • Improves sleep pattern • Improves well-being</td>
<td><strong>Contraindications</strong> Patients treated with MAOI’s Patients with cardiac arrhythmias <strong>Cautions</strong> Cardiovascular disorders, closed angle glaucoma, epilepsy QT prolongation <strong>Side effects</strong> Anticholinergic effects, drowsiness, hyponatraemia, fatigue, confusion, sedation</td>
</tr>
<tr>
<td><strong>Class: tricyclic antidepressant</strong></td>
<td>Start at low dose at 10mg daily, given at night and increase gradually according to pain response to max dose of 75mg daily. Cheap and more cost effective than pregabalin or duloxetine</td>
<td><strong>Cautions</strong> Abuse potential, congestive heart disease, Avoid abrupt withdrawal(taper dose over at least one to two weeks) <strong>Side effects</strong> Dizziness, somnolence, headache. Drowsiness, peripheral oedema, dry mouth, fatigue, blurred vision, diplopia, vertigo, nausea, diarrhoea, impaired memory, weight gain</td>
</tr>
<tr>
<td><strong>First line therapy – pregabalin</strong></td>
<td>Starting dose 150mg per day in two to three divided doses The dose can be increased to 300mg after 3 to 7 days and to 600mg after a further 7 days. The maximum daily dose is 600mg.</td>
<td><strong>Cautions</strong> Abuse potential, congestive heart disease, Avoid abrupt withdrawal(taper dose over at least one to two weeks) <strong>Side effects</strong> Dizziness, somnolence, headache. Drowsiness, peripheral oedema, dry mouth, fatigue, blurred vision, diplopia, vertigo, nausea, diarrhoea, impaired memory, weight gain</td>
</tr>
<tr>
<td>Medication type/classifications</td>
<td>Indications for this medication</td>
<td>Potential side effects and/or notes of caution when choosing this medication</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **First line therapy – duloxetine**  
Class: Serotonin-norepinephrine Reuptake Inhibitors (SNR). Start at 60mg dose (in elderly start at 30mg).  
Increase dose according to pain response to maximum of 120mg daily | • Relives pain  
• Improves sleep pattern  
• Improves well-being  
• Reduces anxiety | **Contraindications**  
Patients reated with MAOIs, hepatic impairment, concomitant treatment with ciprofloxacin or enoxacin, uncontrolled hypertension, severe renal impairment, CrCl<30mls/min  
**Cautions**  
Combinations with tricyclics  
Serotonin syndrome  
Patients with bleeding tendencies  
Patients treated with anticoagulants  
Avoid abrupt withdrawal  
**Side effects**  
Hyponatraemia, nausea, vomiting, constipation, diarrhoea, weight changes, dry mouth, sweating, insomnia, headache, somnolence |

**Second line therapy – combination of the above treatments – See Table 19**

**Third line therapy – ask for specialist advice, refer to consultant endocrinologist/diabetes service**
Table 18: Algorithm for recommended care pathway for managing painful diabetic peripheral neuropathy

Refer to drug SPC (summary of product characteristics) for full list of side effects and drug interactions

Patient with painful peripheral diabetic sensori-motor neuropathy

Exclude other potential causes – alcohol history, medication, check vitamin B12 and folate

Optimise diabetes control and choose option 1, 2 or 3

Option 1
Start amitryptilline and titrate dose according to patient response (see table 16 for dose information)

If there is no satisfactory response to treatment within 2 to 4 months
Switch to or combine with oral pregabalin or
Switch to oral duloxetine

If there is no satisfactory response to treatment after 6 months and the patient remains in pain or discomfort due to neuropathy then refer for specialist opinion. The patient may need addition of analgesics like opioids such as tramadol.
Chapter 17
Management of Erectile Dysfunction (ED)

Definition
Erectile dysfunction (ED) is the persistent inability to attain and maintain an erection sufficient to permit satisfactory sexual performance.

Although a benign disorder, it affects physical and psychosocial health and has a significant impact on the quality of life of patients, their partners and families.

Prevalence
Moderate to severe ED affects approximately 5-20% of all men and is common in middle-aged and older men with type 2 diabetes where it may affect up to 50% of patients (American Diabetes Association, Clinical Practice Recommendations 2013; Scottish Intercollegiate Guidelines Network 2010; National Institute for Clinical Excellence 2009; UK Prospective Diabetes Study Group, 1999).

Monitoring
Male patients should be asked at diagnosis and at least once per year (at their annual review) whether they have ED. Erectile Dysfunction Questionnaires are available, which may help in this assessment process (Wespes et al 2006), for example, the Simplified International Index of Erectile Function IIEF5 available on www.midva.com/en/vprasalnik.

Treatment
Non-pharmacotherapy
The following are all beneficial in improving erectile function:
- reducing alcohol intake;
- increasing exercise; and
- losing weight.

In addition counseling or stress management may help erectile function.

A detailed medication history should be taken as certain drugs can affect erectile function.

Audit suggestions
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to people with Type 2 diabetes:
- evidence that male patients with Type 2 diabetes have been asked about ED at least once per year at their annual review;
- evidence that patients with ED have been offered non-pharmacotherapy to deal with their ED, and additional pharmacotherapy if necessary;
- prevalence of erectile dysfunction in Type 2 diabetes; and
- response to oral PDE5 treatment
Chapter 17: Tables and appendices

Table 19: Pharmacotherapy and erectile dysfunction in Type 2 diabetes

Table 20: Algorithm: treatment for the management of erectile dysfunction

Appendix 20: Drugs that may contribute to erectile dysfunction
<table>
<thead>
<tr>
<th>Medication type / classifications</th>
<th>Advantages of this medication</th>
<th>Potential side-effects and/or notes of caution when choosing this medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First-line therapy – PDE5 inhibitors</strong></td>
<td>Cause smooth muscle relaxation of the blood vessels supplying the corpus cavernosum.</td>
<td>Contraindications Patients on nitrate therapy, recent stroke, recent MI, severe hepatic impairment, retinal disorders, NAION, unstable angina, severe cardiac failure. <strong>Interactions:</strong> see SPC for list. CYP3A4 inhibitors, CYP3A4 inducers, grapefruit juice, alpha blockers eg doxazosin. <strong>Side Effects</strong> Headache, flushing, dizziness, dyspepsia and nasal congestion, visual disturbances, dyspepsia myalgia, mild low back pain. Risk of non-arteritic ischaemic optic neuropathy. Rare sudden hearing loss rarely with tadalafil.</td>
</tr>
<tr>
<td>• Sildenafil</td>
<td>Will work in 60-75% of cases. • Sildenafil and vardenafil are relatively short-acting drugs with a half-life of approximately 4 hours. • Tadalafil has a significantly longer half-title of 17.5 hours.</td>
<td>• May be more acceptable to elderly patients. • May be acceptable to patients on nitrate therapy.</td>
</tr>
<tr>
<td>• Tadalafil</td>
<td>• Penile Pain • Bruising • Numbness and delayed ejaculation in up to 30% of patients. • Skin necrosis may occur but is rare.</td>
<td></td>
</tr>
<tr>
<td>• Vardenafil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Avanafil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start at low dose and titrate dose according to response.</td>
<td>These drugs initiate erection and require sexual stimulation for an erection to occur.</td>
<td></td>
</tr>
<tr>
<td><strong>Second-line therapy – vacuum erection device</strong></td>
<td>The device applies a negative pressure to the penis to draw venous blood from the penis, which is then retained by application of a visible band at the base of the penis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• May be more acceptable to elderly patients. • May be acceptable to patients on nitrate therapy.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to drug SPC (summary of product characteristics) for full list of side effects and drug interactions.
## Table 19: Pharmacotherapy and erectile dysfunction in Type 2 diabetes

<table>
<thead>
<tr>
<th>Second-line therapy – intracavernous injection therapy</th>
<th>Effective with success rates of about 70%.</th>
<th>Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used in the 25-30% of non responders to PDE5 therapy.</td>
<td>Erection occurs typically 5-15 minutes after penile injection and frequently last 30-40 minutes.</td>
<td>Patients on anticoagulants. Patients with coronary heart disease. Medical predisposition to priapism. If erection is sustained for ≥4 hours the patient should seek medical assistance.</td>
</tr>
<tr>
<td>Alprostadil is a prostaglandia E1 and causes vasodilatation of the blood vessels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It can be given as an injection called (Caverject) at doses of 5-40ug or as a urethral suppository called MUSE at doses of 0.25 – 1mg.</td>
<td></td>
<td>Side Effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post injection penile pain, prolonged erections, priapism, penile fibrosis, sinusitis, respiratory infection, headache, hypertension, nausea, dry mouth, abdominal pain, odema, haematoma.</td>
</tr>
</tbody>
</table>

| Third-line therapy – penile prosthesis | | |
|---------------------------------------| | |
Table 19: Algorithm – Treatment for the Management of Erectile Dysfunction

Refer to drug SPC (summary of product characteristics) for full list of side effects and drug interactions.

Male patient with Type 2 diabetes and erectile dysfunction

Check early morning testosterone in male patients < 60 years or with symptoms and signs of hypogonadism.

If testosterone is normal:

Trial of PDE5 therapy
- Sildenafil – (start at 50mg; increase to 100mg; according to response).
- Tadalafil – (start at 10mg and increase to 20mg; according to response).
- Vardenafil – (start at 10mg and increase to 20mg; according to response).
- Avanafil – (start at 10mg and increase to 20mg; according to response).
- Start at low dose and increase to max dose if there is an unsatisfactory response.

If unsatisfactory response; refer to consultant urologist with an interest in ED for consideration of second- or third-line therapy.

If testosterone is low:

Check
- FSH/LH/prolactin
- Ferritin/transferring saturation

Refer to hospital diabetes and endocrinology service for opinion.
Appendix 20: Drugs that may contribute to erectile dysfunction
(Please note – may not be a complete list)

<table>
<thead>
<tr>
<th>Class of drug</th>
<th>Individual agents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Refer to drug SPC (summary of product characteristics) for full list of side effects and drug interactions</td>
</tr>
<tr>
<td>Diuretics</td>
<td>• Thiazides</td>
</tr>
<tr>
<td></td>
<td>• Spironolactone</td>
</tr>
<tr>
<td>Other anti-hypertensives</td>
<td>• Beta-blockers</td>
</tr>
<tr>
<td></td>
<td>• Clonidine</td>
</tr>
<tr>
<td></td>
<td>• Verapamil</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>• Tricyclic antidepressants</td>
</tr>
<tr>
<td></td>
<td>• MAOI</td>
</tr>
<tr>
<td></td>
<td>• SSRIs</td>
</tr>
<tr>
<td></td>
<td>• Lithium</td>
</tr>
<tr>
<td></td>
<td>• Phenothiazines</td>
</tr>
<tr>
<td></td>
<td>• Butyrophenones</td>
</tr>
<tr>
<td>H2 antagonists</td>
<td>• Cimetidine</td>
</tr>
<tr>
<td></td>
<td>• Ranitidine</td>
</tr>
<tr>
<td>Hormonal therapies</td>
<td>• Estrogens</td>
</tr>
<tr>
<td></td>
<td>• Steriods</td>
</tr>
<tr>
<td></td>
<td>• LHRH agonists</td>
</tr>
<tr>
<td></td>
<td>• 5-alpha reductase inhibitors</td>
</tr>
<tr>
<td></td>
<td>• Cyproterone acetate</td>
</tr>
<tr>
<td>Other agents</td>
<td>• Digoxin</td>
</tr>
<tr>
<td></td>
<td>• Genfibrizol</td>
</tr>
<tr>
<td></td>
<td>• Methotrexate</td>
</tr>
<tr>
<td></td>
<td>• Cyclophosphamide</td>
</tr>
</tbody>
</table>
Diabetes and obesity
Most people with Type 2 diabetes are overweight or obese and even those with an apparently normal body mass index (BMI 18.5-25 kg m²) may carry an excess of central or visceral fat, associated with increased metabolic and cardiovascular risk.

Lifestyle measures like dietary modification and increased physical activity levels (not just exercise) are the cornerstone of the management of Type 2 diabetes. People with type 2 diabetes if overweight should be encouraged to start losing weight as part of your lifestyle changes to improve your diabetes control. However, it is important to note that many of these patients have relatively healthy diets and are not sedentary. They regularly exceed the arbitrarily defined thresholds for physical activity intensity and duration. Don’t make assumptions about a patient’s behavior on the basis of their BMI or IFCC/HbA1c.

Clinical assessment
History
Ask the patient:
- the quality and quantity of food ingested;
- whether or not food intake is emotionally driven or if hunger and lack of satiety are problems;
- if snacking occurs between meals;
- if binge eating or purging occurs; and
- if there is a history of current or past emotional or psychological trauma

Physical activity
If there is physical inactivity, is it because of pain, embarrassment or a combination of the two? In discussing behaviour change, setting SMART (Specific, Measurable, Achievable, Realistic and Timed) goals can be effective: “By my next clinic visit I will be walking 5km three times per week”.

Co-morbidities
Aside from pain in weight-bearing joints, are there other co-morbidities like:
- obstructive sleep apnoea;
- fatty liver disease;
- infertility
- depression; or
- psoriasis.
The presence of skin tags and acanthosis nigricans can signify insulin resistance. Non-alcoholic fatty liver disease (NAFLD) is suggested by an elevated alanine amino transferase (ALT) or an ‘echo-bright’ liver ultrasound and may need referral to a hepatologist.

**Treatment**

Lifestyle modification strategies leading to weight loss and increased physical activity are the cornerstone of management of overweight and obese people with Type 2 diabetes. It is important that weight loss is gradual, 1-2 lbs (0.45-0.9kg) a week is a safe amount to lose. Aim should be to lose 5-10 kg (11-21lbs) over 3-6 months, or aim to lose 10% of actual body weight. People should be encouraged to weigh themselves once a week to monitor their progress. Please refer to chapters 7 and 8 for nutrition and physical activity guidelines for people with Type 2 diabetes.

Most patients need drug treatment for their diabetes. Where possible, anti-diabetic drugs that are weight neutral (for example, metformin and DPP4 inhibitors) or weight reducing (for example, GLP1-RA or SGLT2 antagonists) are preferable to those that are likely to cause weight gain (for example, insulin and sulphonylureas).

While weight loss is to be welcomed in the vast majority of patients, other factors are probably more important in determining improvements in health, such as:

- reductions in HbA1c
- increases in aerobic fitness
- smoking cessation

A patient who was sedentary and smoking with a IFCC of 77mmol/mol (9.2%) six months ago who hasn’t smoked since, swims 30 lengths of his local pool every day, and has a IFCC (HbA1c) of 48mmol/mol (6.5%) is making excellent progress, regardless of weight change.

The Second Diabetes Surgery Summit (DSS-II), an international consensus conference in 2015 jointly organised with Diabetes UK, the American Diabetes Association, the International Diabetes Federation, the Chinese Diabetes Society and Diabetes India, recently developed global guidelines to inform clinicians and policy makers about the benefits and limitations of “metabolic” type 2 diabetes bariatric surgery. In a joint statement, published in Diabetes Care in June 2016, the group stated that obesity surgery, which was originally designed to induce weight loss, should be included among the current treatment options for some people with type 2 diabetes. Specifically, the new guidelines state that surgery should be recommended in type 2 diabetes patients with a BMI ≥40 kg/m² (regardless of their blood glucose control), and for those with a BMI ≥30 kgm⁻² with poor glycaemic control despite lifestyle modification and blood glucose lowering medication. It is also recommended that the BMI thresholds in Asian people with type 2 diabetes should be lowered by 2.5 kg/m² (Rubino et al, 2016). While this therapeutic option is not widely available in Ireland at present; this is likely to change in the coming years. People with type 2 diabetes and a BMI ≥ 30 kg m² should be considered for referral to a specialist obesity service.
Diabetes and pregnancy
Diabetes is the most common medical problem in pregnant women (American Diabetes Association, Clinical Practice Recommendations 2013; Dunne F, 2009). It is associated with:
• less satisfactory outcomes for the mother and infant when compared with the non-diabetic population;
• an increased risk of congenital malformation; and
• perinatal morbidity and mortality in the offspring.

In Type 2 diabetes the situation is made worse because the women are:
• often older;
• more obese;
• of non-Caucasian background;
• frequently of higher parity;
• more likely to have chronic hypertension; and
• be treated with medications associated with congenital abnormalities

Pre-pregnancy care (PPC)
Pre-pregnancy care is associated with (Dunne F, 2009):
• significantly improved pregnancy-related outcomes;
• lower rate of congenital anomalies;
• earlier ante-natal booking with lower IFCC/HbA1c at booking; and
• reduced premature deliveries.

Despite the benefits of PPC many women with Type 2 diabetes are not aware of the significance of the importance of glycaemic control at the time of conception or there is no PPC service for them to access.

Pre-pregnancy management
Achieve excellent glycaemic control prior to conception – a glycated haemoglobin IFCC < 48mmol/mol (American Diabetes Association, Standard of Medical Care in Diabetes-2016; Dunne F, 2009; Office of the Nursing and Midwifery Services Directorate HSE 2010) by:
• changing diet;
• increasing exercise activity; and
• using insulin de-novo if needed; or
• switching other hypoglycaemic agents to insulin
Pre-pregnancy care should also include (Dunne F, 2009; Office of the Nursing and Midwifery Services Directorate HSE 2010):

- using a high dose folic acid (5mg) for a minimum of 12 weeks of treatment;
- altering anti-hypertensive therapy (expert advice required);
- stopping potentially teratogenic medication (ACE, ARB, SGLT2, GLP, DPP4)
- screening for and managing diabetes-related complications; and
- establishing retinopathy and nephropathy status

See Table 21: Algorithm for pre-pregnancy care (PPC)

Auditing suggestions
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to people with Type 2 diabetes are:

- to assess the percentage of women hitting their targets before they become pregnant;
- show evidence of medication review completed for all women of child-bearing age with Type 2 diabetes (not on insulin) who are actively considering becoming pregnant;
- show evidence that medication changes were made (statins stopped, switches in BP medications) in advance of the woman becoming pregnant; and
- show evidence that women with Type 2 diabetes planning pregnancy are referred to diabetes pre-pregnancy clinic or specialist secondary diabetes service

The information in this chapter is adapted from Guidelines for the Management of Diabetes in Pregnancy, Dunne F, 1st Edition 2009 and Guidelines for the Management of Pre-Gestational and Gestational Diabetes Mellitus from Pre-conception to the Postnatal period, Office of the Nursing and Midwifery Services Directorate HSE 2010

Chapter 19: Tables and appendices

Table 21: Algorithm for pre-pregnancy care (PPC)

Appendix 21: Issues to be covered by GP/practice nurse at consultation with women with Type 2 diabetes who are actively considering pregnancy

Appendix 22: Advice on contraception
Table 21: Algorithm for Pre Pregnancy Care (PPC)

The following algorithm outlines the key steps in pre pregnancy care when dealing with women with T2DM (not on insulin) who are actively considering becoming pregnant, in primary care, to ensure the best possible outcomes for the woman and baby are achieved:

1. GP provides woman with key advice on Pregnancy and Diabetes

2. GP advises woman with diabetes the need for:
   1. Tight glucose control – target IFCC/HbA1c
   2. Discuss contraception
   3. Refer to pre-pregnancy service or secondary care diabetes service

3. Prescribe folic acid 5mg for 12 weeks.

4. Prior to Hospital Appointment
   1. Complete baseline bloods IFCC (HbA1c), FBC, Creatinine, ACR, TFT; TPO antibodies, Rubella status.
   2. Ensure recent eye screen
   3. Arrange dietetic review
   4. Refer to PN to initiate blood glucose monitoring

5. PN provides woman with advice on key issues related to diabetes and pregnancy (see appendix 21 Issues to be covered by GP/Practice Nurse at consultation with women with Type 2 diabetes are actively considering pregnancy)
Appendix 21

Appendix 21: Issues to be covered by GP/practice nurse at consultation with woman with Type 2 Diabetes who are actively considering pregnancy

- Discuss current contraception use (see Appendix 22: Advice on contraception)
- Discuss the need to discontinue smoking
- Discuss implications of alcohol to foetus
- Discuss implications of obesity in pregnancy
- Discuss the possible effect of pregnancy on retinopathy and renal function
- Update on diet and refer to dietitian
- Update diabetes education and the link between diabetes and pregnancy outcome
- Daily 7 point glucose measurements
- Recognition and treatment of hypoglycaemia
- Discuss the use of the glucagon kit
- Discuss hypoglycaemia and driving
- Ensure the patient has been recently screened for
  - retinopathy screen and
  - renal disease
- Encourage early booking to antenatal care
- Refer to specialist diabetes centre for pre-pregnancy care
Appendix 22

Appendix 22: Advice on contraception

Planning a pregnancy is essential and therefore contraception is required until appropriate HbA1c level is achieved. By the time most women discover they are pregnant organogenesis is complete and therefore congenital anomalies due to high glucose or drugs will have occurred. All forms of contraception are suitable for women with diabetes (Dunne F, 2009, Office of Nursing and Midwifery Services Directorate, HSE 2010).

Contraception pill
The combined Oral Contraceptive Pill (OCP) and the Progestogen-only Pill (POP) can be used by most women with diabetes and are 99% effective if used correctly. They must be taken at the same time each day. There may be a temporary increase in blood sugar levels when initiated but this can be offset by making changes to diabetes medication. Blood pressure may increase and should be monitored as in a woman without diabetes. The POP can be used when breast feeding and is more suitable when diabetes complications exist.

Long acting contraception
Long acting contraception in the form of injection or an implant has the advantage that compliance is not an issue. It too is 99% effective but may be associated with irregular menstrual bleeding. Injectable contraceptive is an effective contraception but may be associated with significant bone loss and increased fracture risk in later life. It should only be used if there is no other suitable option. Injectable contraceptive cannot be removed if side effects develop.

Intrauterine coil
The intrauterine coil is also 99% effective and lasts for five years. An advantage is that it does not affect blood glucose levels. It is suitable for older women, can be used while breastfeeding and for those where the pill is contraindicated or has been associated with side effects.

Barrier Methods
Barrier methods of contraception have no side effects generally. They are less effective (95%) when used correctly and cannot be used in those with latex allergy.
Chapter 20
Medication Review

The purpose of the medication review is to provide clear evidence-based practice in managing the person with Type 2 diabetes. Medication review is an integral part of all reviews by any healthcare professional: practice nurse; GP; and community pharmacist (CP).

The aim of the annual clinical medication review is to:
- promote healthier patient outcomes and self-management of the disease;
- improve and optimise drug therapy;
- improve and optimise lifestyle;
- achieve safe, effective and appropriate use of all types of medications, medication devices and supplies;
- advise on the appropriate local services for the disposal of unused and/or expired medication;
- increase patient awareness of appropriate dosing and related therapy issues;
- improve quality of life for patients living with diabetes; and
- improve patient access to health care providers and services

Definitions

Clinical medication review
A clinical medication review is specifically undertaken by a doctor, nurse or pharmacist in the presence of the patient.

Medication usage review
This is a review of the patient’s usage of their medicines. The patient will bring their medications including non-prescribed medication to a consultation with the pharmacist, who will review their medications one by one to establish:
- how they take them;
- when they take them;
- their knowledge of why they are taking them;
- any difficulties experienced with taking the medicines;
- side-effects experienced;
- assistance needed to access their medicines; and
- assistance remembering when to take their medicines

The pharmacist will advise the individual on how best to take their medicines and advise the GP of any issues with the person’s current medicine taking.
See Table 22: Algorithm for pre-patient visit work up for annual clinical medication review by practice nurse/GP for the person with Type 2 diabetes on two glucose lowering agents (not insulin)

Audit procedures
Suggested areas for auditing this process in line with the principle of continuous improvement in the services delivered to people with Type 2 diabetes are:

- showing evidence that an annual clinical medication review has been conducted;
- showing evidence that patients meeting the criteria for referral have medication usage reviews carried out by the community pharmacist;
- showing evidence of clinical medication reviews conducted for patients who were discharged from hospital;
- the percent of patients having annual medication reviews;
- the percent of patients meeting the criteria for MUR (medication usage review) referral; and
- the percent of eligible patients having had MUR carried out by the community pharmacist

Chapter 20: Tables and appendices

Table 22: Algorithm for pre-patient visit work up for annual clinical medication review by practice nurse/GP for the person with Type 2 diabetes on two glucose lowering agents (not insulin)

Appendix 23: Review of GP practice prescription ordering

Appendix 24: Medication compliance report

Appendix 25: Decision tool for referring patients to community pharmacy for medication usage review (MUR)

Appendix 26: Guide for conducting an effective annual clinical medication review
Table 22: Algorithm for Pre Patient Visit Work Up for Annual Clinical Medication Review by PN/GP for the patient with T2DM on two glucose lowering agents (not insulin)

PN: Reviews patient medication profile as per most recent practice consultation

PN: Reviews the patients prescription

Practice Nurse, were possible, contacts patient’s pharmacy to ascertain patient medication compliance

PN notes whether patient has been discharged from Hospital within previous 6 weeks and whether medication has been changed.

PN notes if there is other evidence of poor administration from information supplied by social services, carer or other care professional

PN decides whether to carry out a Clinical medication review with the patient or to refer to pharmacist for a full Medication Usage Review (MUR) per decision tool

Community Pharmacist conducts a full Medication Usage Review (MUR)

Community Pharmacist feeds back results of Medication Usage Review (MUR) to the PN/GP

PN/GP conducts Annual Clinical Medication Review with the Patient

Appendix 23

Appendix 24

Appendix 25
Appendix 23

Appendix 23: Review of GP practice prescription ordering

For computerised practices

- The practice nurse will have computerised records of when GMS prescriptions were written, monthly/3 monthly
- For long term illness patients the record for prescription issuing will probably be every 6 months

For non-computerised practices

- The patients notes may records dates of issuing prescriptions
- The practice nurse will review this information to obtain an impression of whether or not the patient is regular in obtaining their prescriptions
Appendix 24

Appendix 24: Medication compliance report

Pharmacies can produce a patient compliance report, which will record
  • the average number of individual medication tablets dispensed per day for the previous 6 months for example 0.8 atorvastatin 10mg indicates 20% doses missed and
  • the interval between dispensing of monthly prescriptions for example 28 days (regular) or 42 days (non-compliant)

The community pharmacist can supply the practice nurse with information;
or
the practice nurse liaises with the community pharmacist to ascertain the patients apparent compliance status.
Appendix 25

Appendix 25: Decision tool for referring patients to community pharmacy for medication usage review (MUR)

If the patient has any one of the following criteria they should be referred to their community pharmacist for a medication usage review (MUR)

A. Using six or more prescribed medications

B. Taking cardiovascular drugs including:
   - digoxin
   - warfarin
   - diuretics
   - antihypertensives
   - nitrates
   - glyceryl trinitrate (GTN)
   - lipid-lowering agents

C. Living alone/poor home support

D. Showing poor medication compliance evident from practice records or other information

E. Recently discharged from hospital where medication has been changed
Appendix 26

Appendix 26: Guide for conducting an effective annual clinical medication review

Practice and GP review the medication with respect to
1. Efficacy/clinical markers
2. Adverse reactions
3. Compliance issues
4. Dosage timing
5. Drug interactions

The practice nurse and GP should try to provide requisite educational material on the medications and their purpose. The practice nurse and GP should liaise with other members of the primary healthcare team to agree and put in place measures to overcome any problems the patient may be experiencing.

Refer to drug SPC (summary of product characteristics) for full list of side effects and drug interactions
Chapter 21

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