The annual diabetes review: **screening, monitoring and managing complications**

An annual diabetes review allows for assessment of glycaemic control and earlier detection of, and intervention for, diabetes-related complications. It also creates an opportunity to regularly review and assess individual treatment plans and provide support if required.

KEY PRACTICE POINTS:

- Regular review of patients with diabetes is essential to prevent or delay the onset of diabetes complications and slow their progression
- Every patient with type 2 diabetes should be reviewed at least annually; more frequent review may be indicated depending on the patient's risk factors
- The main components of a diabetes review are an examination of the feet, assessing cardiovascular disease (CVD) risk, requesting HbA_{1c}, lipid levels, renal and liver function tests, assessing mental health and general wellbeing, and ensuring retinal photoscreening is up to date
- The cornerstones of managing CVD risk and preventing or delaying microvascular complications are lifestyle interventions, optimising glycaemic control, blood pressure and lipid levels; pharmacological treatment is often indicated depending on the patient's risk factors and individualised treatment targets

Diabetes complications: prevention and early detection are key

Diabetes is associated with a range of complications that are a major cause of disability, morbidity and mortality, including vision loss, lower-limb amputation, renal and cardiovascular disease.[1] With the prevalence of type 2 diabetes in New Zealand predicted to increase by 70 – 90% in the next 20 years, the burden of diabetes complications on patients and the healthcare system will also increase.[2] Ensuring patients are regularly reviewed is essential to preventing or delaying the onset of diabetes complications and slowing their progression.

Types of diabetes complications

The main complications of diabetes are classified as microvascular or macrovascular complications.

Microvascular complications of diabetes include:[3]

- Retinopathy
- Nephropathy
- Neuropathy – peripheral and autonomic (e.g. erectile dysfunction)

Macrovascular complications of diabetes include:[3]

- Cardiovascular disease (CVD)
- Cerebrovascular disease
- Peripheral vascular disease

Other conditions that are commonly associated with diabetes include:[3]

- Increased risk of infection, e.g. skin, recurrent genitourinary infection, fungal infection
- Dermatological, e.g. diabetic dermopathy, acanthosis nigricans, psoriasis
- Dental and periodontal disease
- Gout
- Polycystic ovary syndrome
- Mental illness, e.g. depression, dementia and disordered eating
- Musculoskeletal, e.g. frozen shoulder, carpal tunnel, Dupuytren's contractures
- Gastrointestinal, e.g. non-alcoholic fatty liver disease, diarrhoea or constipation (due to diabetic autonomic neuropathy)[4]
- Solid cancers, e.g. breast, bowel, lung, pancreatic, ovarian

Risk factors for diabetes complications

All people with type 2 diabetes are at risk of long-term complications. Factors that increase this include:[3]

- Early onset diabetes
- Older age
- Māori or Pacific ethnicity; any non-European ethnicity
- Low socioeconomic status
- Long duration of diabetes
- Poor glycaemic control
- Pre-existing complications or co-morbidities, e.g. established CVD, microalbuminura and/or reduced estimated glomerular filtration rate (eGFR), hypertension, dyslipidaemia, obesity
- Smoking
- Reduced engagement with health services
- Poor adherence to treatment

The basic components of an annual diabetes review

The following list describes the basic components of an annual diabetes review. In practice, these may be reviewed at different times, but all should be performed at least once per year.[3] More frequent review may be indicated depending on the patient's risk factors.

N.B. An annual review is a quality standard of care for all people with type 2 diabetes in New Zealand.[5]

- **Measure:**
  - ☐ Weight and waist circumference*
  - ☐ Blood pressure
- **Examine:**
  - ☐ Neurovascular examination of the feet (also include skin, nails, deformity)
  - ☐ Teeth and gums
- **Request:**
  - ☐ HbA_{1c}
  - ☐ Urinary albumin:creatinine ratio
  - ☐ Serum creatinine
  - ☐ Liver function tests
  - ☐ Non-fasting lipid studies
- **Review:**
  - ☐ Ensure retinal photoscreening is up to date (every two years)
  - ☐ Cardiovascular symptoms (e.g. chest pain) and risk – using a validated CVD risk calculator (see below)
  - ☐ Smoking status
  - ☐ Alcohol intake and recreational drug use
  - ☐ Mental health – see: "Stay vigilant for diabetes burnout and distress"
  - ☐ Influenza, pneumococcal and COVID-19 immunisation status – people with diabetes are eligible for funded annual influenza vaccination and early access to COVID-19 vaccination; pneumococcal vaccination is recommended, but not funded. See the Immunisation Handbook 2020 for further information: **www.health.govt.nz/our-work/immunisation-handbook-2020**
  - ☐ Contraception – pregnancy planning is recommended for women with known diabetes who wish to conceive, e.g. ensure glycaemic control is optimal and the medicine regimen is appropriate while pregnant and breastfeeding
  - ☐ Ensure cervical, breast and bowel cancer screening up to date
  - ☐ Any other associated complications, e.g. sexual dysfunction, recurrent skin or genitourinary infection

* Although waist circumference measurement is recommended in guidelines, in practice this may be of limited usefulness and is therefore not essential

The recommended CVD risk calculator for people with type 2 diabetes is available from the New Zealand Society for the Study of Diabetes**: www.nzssd.org.nz/calculators/calculator/1/cvd-risk-assessment**

Further information on managing diabetes in pregnancy is available in the New Zealand Society for the Study of Diabetes type 2 diabetes management guidance, available from: **https://t2dm.nzssd.org.nz/Section-99-Diabetes-in-pregnancy**

Managing type 2 diabetes complications

Lifestyle interventions (i.e. exercise and dietary management for weight loss, smoking cessation, reducing alcohol intake) and optimisation of glycaemic control, blood pressure and lipid levels are the cornerstones of managing CVD risk and preventing or delaying microvascular complications. Pharmacological treatment is often indicated, depending on the patient's risk factors and individualised treatment targets.

For further information on optimising glycaemic targets in older people, see: **bpac.org.nz/2019/diabetes-elderly.aspx**

For further information on weight loss for people with type 2 diabetes, see: "Weight loss for the prevention and treatment of type 2 diabetes", Page 15

Managing CVD risk in people with type 2 diabetes

Hypertension

Individualised blood pressure targets are recommended for people with hypertension and type 2 diabetes (Table 1). Less stringent targets may be indicated for patients at higher risk from hypotension, e.g. older people, diabetic autonomic neuropathy.[3]

A CVD risk calculator validated for use in people with type 2 diabetes is available here: **www.nzssd.org.nz/calculators/calculator/1/cvd-risk-assessment**

N.B. CVD risk calculators may underestimate risk in younger patients or those with a strong family history.[3]

Pharmacological treatment choice is guided by the presence of diabetic kidney disease

The type of pharmacological treatment for patients with type 2 diabetes and hypertension is determined by whether they have diabetic kidney disease (DKD):[3]

- **If DKD present:** Initiate an angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor blocker (ARB)
- **If DKD absent:** Initiate an ACE inhibitor, ARB, calcium channel blocker or thiazide diuretic first-line; an ACE inhibitor is recommended first-line for patients with heart failure[6]

Multiple antihypertensives are often required to achieve a blood pressure < 130/80 mmHg and there should be a low threshold for initiation of a second antihypertensive, e.g. a calcium channel blocker.[3]

For further information on selecting an antihypertensive, see: **bpac.org.nz/2021/ace.aspx**

For further information on managing DKD, see: **bpac.org.nz/2019/renal.aspx**

Dyslipidaemia

The decision to initiate a statin in people with type 2 diabetes is determined by the patient's CVD risk and whether they have established macrovascular or renal complications (Table 2).[3] A target LDL cholesterol of < 1.8 mmol/L is recommended for patients with CVD risk > 15% or a TC/HDL-C ratio ≥ 8, with treatment titrated based on non-fasting lipid studies every three to six months until the target is reached.[3] Patients who have a five-year CVD risk > 15% and LDL cholesterol > 2 mmol/L despite taking the maximum tolerated dose and potency of statin should have ezetimibe added to their regimen (Special Authority approval required).[3]

Table 1. Blood pressure targets for people with type 2 diabetes and hypertension[3]

Patient category	Blood pressure (BP) target	
	Systolic	Diastolic
Known microvascular or macrovascular complications OR five-year CVD risk > 15%	< 130 mmHg	< 80 mmHg
No microvascular or macrovascular complications AND five-year CVD risk < 5%	< 140 mmHg	< 90 mmHg
Five-year CVD risk 5 – 15%	< 130 mmHg	< 80 mmHg
Young patients with microvascular or macrovascular complications	< 125 mmHg	< 75 mmHg

Stay vigilant for diabetes burnout and distress

Emotional distress due to living with diabetes and the burden of self-management, termed "diabetes distress", is common among people with diabetes, affecting one in five people with type 2 diabetes who are treated with insulin and one in six people who are not treated with insulin.[12] Diabetes distress ranges in severity and can fluctuate over time; following diagnosis, major changes in treatment, diagnosis or worsening of complications, and heightened life stress, are times when the emotional burden of diabetes management can peak.[12] Diabetes distress is a risk factor for worsening diabetes control (see below), worsening severity of diabetes distress, and depression or anxiety disorders.[12]

Routinely ask people with type 2 diabetes about how they are coping with self-management and how they feel about living with type 2 diabetes and life in general; diabetes distress relates specifically to living with and managing diabetes, while depression affects how they feel about life in general (which may include how they feel about living with diabetes).[12] If the conversation suggests symptoms of depression or anxiety, a screening inventory, e.g. the PHQ-9 or GAD-7 questionnaires, can be used to aid diagnosis and assess severity (see below).[12]

Non-adherence is a risk factor for worsening diabetes control

Treatment adherence is essential for preventing or delaying diabetes complications, yet many patients experience issues with adherence at some point along their diabetes journey. Factors contributing to treatment non-adherence include: [13, 14]

- Younger age
- Longer duration of disease
- Lack of perceived benefit of medicines
- Hypoglycaemia
- Regimen complexity and inconvenience
- Clinician-patient relationship
- Access to healthcare

Patient self-reporting, regular monitoring of HbA_{1c}, review of blood glucose monitoring (for patients taking insulin) and whether patients return for repeat prescriptions on time, are the most practical indicators about adherence for prescribers. Asking patients in a non-judgemental manner how they are managing with their medicines may be a helpful way to initiate the conversation.

Strategies to improve adherence could include:[13, 14]

- Patient education that includes discussion of the importance of good diabetes control for future health and addresses patient fears, misconceptions or misgivings about treatment
- Regular treatment review to:
  - Assess dose or treatment type, e.g. if adverse effects are intolerable
  - Assess regimen and consider simplification, including medicines for co-morbidities
- Establishing a plan for monitoring and communicating issues with hypoglycaemia in patients who are initiating sulfonylureas or insulin
- Encouraging use of smartphone apps or reminders to take their medicines; for examples, see: **www.healthnavigator.org.nz/apps/m/medication-reminder-apps/**
- Flag patients with a history of non-adherence or who are at risk of non-adherence for follow up with a practice nurse by phone or text at the time of prescription renewal

bestpractice by BPAC Clinical Solutions offers a range of electronic decision support tools for assessing and managing patients with depression. These modules are part of a nationally-funded suite of resources available free-of-charge to all primary care practices in New Zealand. There are separate modules for managing adults, elderly people, young people and women in the antenatal and postnatal periods with depression. The assessments incorporate the PHQ-9, GAD-7, and EPDS questionnaires and the K10 checklist. For further information, see: **www.bestpractice.net.nz/feat_mod_NatFunded.php**

The PHQ-9 questionnaire is available from: **www.healthnavigator.org.nz/tools/p/patient-health-questionnaire-9-phq-9/**

The GAD-7 questionnaire is available from: **www.healthnavigator.org.nz/tools/g/general-anxiety-scale-gad-7/**

Table 2. Statin treatment recommendations for people with type 2 diabetes[3]

Patient category	Treatment recommendation
Established macrovascular complications OR five-year CVD risk > 15%	Statin recommended
Five-year CVD risk 5 – 15%	Consider statin
Five-year CVD risk < 5%	Consider statin if one of the following: ■ Young ■ Strong family history of early cardiovascular disease ■ History of familial hypercholesterolaemia
DKD	Statins recommended regardless of CVD risk

For further information on prescribing statins, see: **bpac.org.nz/2021/statins.aspx**

Consider antiplatelet treatment for patients with high CVD risk

Aspirin, 100 mg daily, is recommended for secondary prevention in all patients with type 2 diabetes; clopidogrel can be used if aspirin is not tolerated.[3] Consider aspirin for primary prevention for patients with five-year CVD risk > 15% AND a low risk of bleeding.[3] People with diabetes have a small increased risk of bleeding[7]; this risk may outweigh the benefits of treatment for primary prevention in patients with lower CVD risk.[3]

For further information on prescribing aspirin for CVD risk management, see: **bpac.org.nz/2018/aspirin.aspx**

Managing microvascular complications

Diabetic retinopathy

Diabetic retinopathy is a common microvascular complication of diabetes; there are two main types:[8]

- **Non-proliferative retinopathy** – characterised by increasing numbers of microaneurysms; at moderate to severe stages, vascular permeability increases, which can lead to macular oedema
- **Proliferative retinopathy** – characterised by the growth of new blood vessels on the retina and posterior surface of the vitreous; formation of scar tissue can cause the retina to detach, leading to permanent vision loss

Diabetes can also increase the risk of other eye conditions, such as cataracts.[3] The main risk factors for diabetic retinopathy are the duration of diabetes (i.e. the longer the duration the greater the risk) and poor glycaemic control; other risk factors include nephropathy, hypertension, dyslipidaemia and smoking.[4]

Key points for preventing or slowing the progression of diabetic retinopathy:[3, 4, 8]

- Refer all newly diagnosed patients with type 2 diabetes for retinal photoscreening; screening should be repeated at least every two years
- All pregnant women with diabetes prior to pregnancy should undergo additional photoscreening in the first trimester; women who develop gestational diabetes do not require photoscreening
- Ensure that glycaemic control and management of hypertension and dyslipidaemia are optimised
- In patients with macular oedema, stop pioglitazone as this can exacerbate the condition by increasing fluid retention. New Zealand guidelines recommended considering initiation of a fibrate (e.g. bezafibrate [unapproved indication]).[3] There is some evidence that fibrate treatment slows the progression of diabetic retinopathy.[9]
- Urgently refer patients with rapid vision deterioration for ophthalmology assessment

For further information on diabetic retinopathy, see: **bpac.org.nz/bpj/2010/august/retinopathy.aspx**

Diabetic kidney disease (DKD)

Key points for managing patients with DKD:[3]

- Initiate an ACE inhibitor or ARB in patients with microalbuminuria (two or more urinary albumin:creatinine ratios (ACRs) in > 3 months of > 2.5 mg/mmol in males and > 3.5 mg/mmol in females) or a decline in eGFR:
  - Repeat the measurement of serum creatinine and potassium 7 – 10 days after initiating an ACE inhibitor or ARB. If eGFR decreases by > 25% or potassium > 6 mmol/L, reduce or stop the ACE inhibitor or ARB.

- Consider adding spironolactone for patients with macroalbuminuria (urinary ACR > 30 mg/mmol) and hypertension, but also consider the risk of hyperkalaemia and further decline in eGFR
- Strongly consider initiating empagliflozin, a sodium glucose co-transporter 2 (SGLT-2) inhibitor, a glucagon-like peptide-1 (GLP-1) receptor agonist (dulaglutide or liraglutide), as these medicines have direct beneficial effects on the kidney and improve renal outcomes in people with type 2 diabetes (Special Authority approval required)[10]
- Strongly consider initiating a statin – recommended regardless of the patient's CVD risk

Monitor the patient's serum creatinine, potassium levels and urinary ACR every three to six months.[3] Ensure doses of other treatments are adjusted accordingly to any decline in eGFR.[3]

For further information on managing diabetic kidney disease, see: **bpac.org.nz/2019/renal.aspx**

For further information on empagliflozin and GLP-1 receptor agonists, see: "New diabetes medicines funded: empagliflozin and dulaglutide", Page 19

The "diabetic foot": managing peripheral diabetic neuropathy and peripheral vascular disease

Key points for managing the diabetic foot in primary care include:[3, 11]

- Optimise glycaemic control and management of hypertension and dyslipidaemia
- Recommend and support smoking cessation to slow progression of peripheral vascular disease
- Provide advice on basic foot care:
  - How to self-check feet
  - Wearing suitable footwear
  - Nail care
  - Moisturising dry feet – consider prescribing cetomacrogol aqueous cream + glycerol (e.g. Sorbolene)
  - When to seek medical advice
- Treatment options for neuropathic pain include:
  - Analgesics for mild pain, e.g. paracetamol or a NSAID. N.B. Use NSAIDs with caution in people with renal impairment, particularly if taking an ACE inhibitor or ARB.
  - Low-dose tricyclic antidepressant, e.g. nortriptyline, amitriptyline (unapproved indication for both medicines) taken in the evening to assist sleep and minimise daytime somnolence
  - Pregabalin or gabapentin
  - Carbamazepine
  - Topical capsaicin 0.075% for localised pain (subsidised by endorsement)

Refer to the New Zealand Formulary for dosing information on medicines used for neuropathic pain: **www.nzf.org.nz/nzf_2556**

For further information on managing diabetic peripheral neuropathy, see: **bpac.org.nz/bpj/2014/june/diabetic-peripheral-neuropathy.aspx**

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