

DIABETES INTEGRATED MODEL OF CARE 2nd edition

	PRIMARY and COMMUNITY CARE 3 MONTHLY CHECK	SECONDARY CARE PRIMARY CARE REFERRAL (1)
DIABETES MELLITUS	----	
Hyperglycaemia	---- > Diabetes New Zealand (2) Diet Exercise – Green Prescription Oral Hypoglycaemics (4) Insulin (4)	---- > Bariatric surgery (3) ---- > Diabetes Clinic
COMPLICATIONS		
1 Microvascular		
<u>Eyes</u>	----	
Retinopathy, Maculopathy	---- > Retinal Photoscreening 2 yearly - minimum	---- > Ophthalmology
<u>Kidneys</u>	----	
Microalbuminuria	---- > Blood, Urine testing 3-6 monthly - minimum	---- > Nephrology (5)
Macroalbuminuria	Smoking Cessation	
End Stage Renal Disease	Blood Pressure – ACEI or ARB (6)	
<u>Nerves</u>	----	
Peripheral neuropathy (7) - Sensory, Motor Autonomic neuropathy - Erectile Dysfunction, Gastroparesis, Postural hypotension	---- > Foot check and education 1 yearly - minimum	---- > Podiatry (8) Orthopaedics (9) Neurology (10)
2 Macrovascular – due to accelerated atherosclerosis		
<u>Ischaemic Heart Disease</u>	I	---- > Cardiology
Angina	I	
Myocardial infarct	I	
Heart Failure	I	
	I	
		treat other major risk factors
<u>Cerebrovascular Disease</u>	I	Smoking - Cessation ---- > Stroke team
Stroke	I	Blood Pressure – Antihypertensives (6)
TIA	I	Cholesterol - Statin (11)
	I	Clotting - Aspirin (12)
	I	
<u>Peripheral Vascular Disease</u> (7)	I	---- > Vascular team (13)
Claudication	I	Podiatry (8)
Arterial ulcer	I	
3 Increase Risk of Respiratory Tract Infections		
Influenza	---- > Influenza vaccination 1 yearly	
Pneumonia	---- > Pneumococcal vaccination (14) 3-5 yearly	

4 Other Selected Complications – not specifically addressed at 3 monthly check

- Depression (15)
- Recurrent Urinary Tract Infections (16)
- Recurrent Bacterial Skin Infections eg. Cellulitis, Furunculosis (boils) (17)

COLOUR CODING – PRIMARY ROLES

General Practitioner

Diabetic Nurse Educator and/or Practice Nurse and/or Community Health Worker

Dietitian

Exercise facilitator

Retinal Photoscreening

NOTES

- The 'Diabetes Integrated Model of Care' is a practical and simplistic overview of Diabetes Mellitus, as it assigns specific roles to primary care workers.
- In reality, tasks may have shared responsibility with multiple therapeutic options possible e.g.

SMOKING CESSATION

Responsibility:

- General Practitioner
- Diabetes Nurse Educator
- Practice Nurse
- Community Health Worker

Therapeutics:

- Ask, Brief advice, Cessation support (ABC) has become the standard of care for helping people to quit smoking. The ABC format can be easily integrated into everyday practice of all health care professionals, so that smokers are presented with every opportunity to quit.
- Pharmacological Management
 - Nicotine Replacement Therapy
 - Nortriptyline
 - Bupropion (Zyban)
 - Varenicline (Champix)

Reference: www.bpac.org.nz
Update on smoking cessation
Best Practice December 2010

REFERENCES

(1) Primary Care Referral

- Referral from Primary to Secondary Care follows National and/or Regional Guidelines.

(2) Diabetes New Zealand

Reference: www.diabetes.org.nz

- Diabetic patients should be offered the contact details of Diabetes New Zealand and/or their local Diabetes Branch for additional support and information.

- Diabetes New Zealand is a non-government non profit organization that represents and supports people affected by diabetes by:
 - Providing local support for people affected with diabetes
 - Acting as an advocate for people affected by diabetes
 - Raising awareness of diabetes, especially interventions that will prevent Type 2 Diabetes or reduce diabetes complications
 - Educating and informing people about diabetes, its treatment, management and control
 - Supporting research into the treatment, prevention and cure of diabetes

Reference: www.bpac.org.nz
 Getting to know patients with type 2 diabetes and poor glycaemic control
 - One size does not fit all
 Best Practice February 2014

- Group-based diabetes education sessions have the advantage of allowing patients with type 2 diabetes to meet each other and discuss management strategies.
- A meta-analysis of group-based diabetes self-management programmes concluded that this approach resulted in improvements in clinical, lifestyle and psychosocial outcomes.

(3) Bariatric Surgery

Reference: www.bestpractice.bmj.com
 Obesity in adults

- Patients with BMI ≥ 40 kg/m² (i.e., morbidly obese category), or ≥ 35 kg/m² with obesity-related comorbidity (e.g., hypertension, diabetes, sleep apnoea, GORD) may be candidates for most bariatric procedures.

(4) Oral Hypoglycaemics & Insulin

Reference: www.bpac.org.nz
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- Introducing the idea of an individualised target for glycaemic control, i.e. 50 – 55 mmol/mol, as “the speed limit” can help patients to understand that HbA_{1c} levels above this level are increasing unsafe.
- However, this target may not be achievable, or even appropriate, for many patients. Glycaemic targets should therefore be mutually agreed on between the patient and clinician, i.e. shared decision-making.
- This recognises that not all patients have the same values or priorities. For example, a small study of older people with type 2 diabetes found that almost half ranked maintaining independence as their most important outcome, while just over one-quarter ranked staying alive the highest.
- Primary care teams need to have a good understanding of the patient’s background, beliefs and priorities. For some patients this may even mean

- accepting that a glycaemic target higher than 64 mmol/mol is appropriate, e.g. for an older patient living alone.
- Revisiting the patient's preferences each time their clinical condition changes is also a routine part of diabetes treatment as patient's priorities may change over time.
 - If patients are unable to achieve agreed glycaemic targets, health professionals need to make additional efforts to engage with them. Regular attendance at diabetes reviews is associated with improved glycaemic control.
 - Insulin initiation should occur routinely in primary care. If resources are not available, a referral can be made to the local Diabetes service.

(5) Nephrology

Reference: www.bpac.org.nz
Interpreting Urine Dipstick Tests in Adults
– A reference guide for primary care
Best Tests June 2013

- **Manage in primary care if:**
 - ACR <70 mg/mmol or PCR <100 mg/mmol; and
 - Haematuria absent and
 - eGFR $\geq 30\text{ml/min/1.73m}^2$
- **Routine referral to nephrology if:**
 - ACR >70 mg/mmol or PCR >100 mg/mmol or
 - Haematuria present and ACR >30 mg/mmol, or PCR >50 mg/mmol or
 - eGFR < 30ml/min/1.73m²
- **Urgent nephrology referral if nephrotic syndrome:**
 - ACR ≥ 250 mg/mmol or PCR ≥ 300 mg/mmol;

(6) Blood Pressure

Reference: www.bpac.org.nz
Getting to know patients with type 2 diabetes and poor glycaemic control
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- Hypertension should be treated, with the target being 130/80 mmHg.
- Lower blood pressure targets should be approached with caution as a systolic blood pressure of < 120 mmHg is associated with a greater frequency of adverse effects in people with type 2 diabetes.
- Treatment of hypertension should include restrictions to dietary salt intake. Reducing daily salt intake by one teaspoon (5 g) per day is estimated to reduce systolic blood pressure by 5 mmHg and diastolic blood pressure by 3 mmHg.
- Lack of salt restriction will blunt the effects and benefits of antihypertensive agents.

Reference: [N Engl J Med 2013; 369:1892-1903](http://www.nature.com/nature)

Combined Angiotensin Inhibition for the Treatment of Diabetic Nephropathy

- ACE inhibitor (or ARB if ACEI isn't tolerated or contraindicated) should be the first-line antihypertensive prescribed in Type 1 and Type 2 Diabetes.
- Combination therapy with an ACE inhibitor and an ARB was associated with an increased risk of adverse events among patients with diabetic nephropathy.

(7) Peripheral Neuropathy & Peripheral Vascular Disease

Reference: www.bpac.org.nz
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- Chronic pain is frequently experienced by people with type 2 diabetes; it is reported to be present in up to 60% of older patients with diabetes.
- Pain should also be considered as a potential reason for non-adherence to lifestyle changes, e.g. pain may reduce a patient's ability to exercise.
- The underlying cause of pain may be a co-morbidity, e.g. osteoarthritis or gout, or may be due to diabetes itself, e.g. peripheral neuropathy or peripheral vascular disease.

(8) Podiatry

Reference: www.bpac.org.nz
Screening and Management of the Diabetic Foot
Best Practice October 2010

- Podiatry services may be provided within: Primary and/or Community and/or Secondary Care.

Reference: www.healthpoint.co.nz

- Funding for podiatry services and referral criteria for people for diabetes related foot complications vary amongst different District Health Boards (DHB) e.g.

Diabetic Foot Clinic Referral Guideline Counties Manukau DHB

Criteria for Diabetic Foot Clinic appointment allocation – Diabetic Patients with one or more of the following: (please specify on referral)

- a) Absence of **both** *peripheral pulses* (Dorsalis Pedis and Posterior Tibial) with symptoms of claudication
- b) Past history of *foot ulcer* or *amputation* (please specify current concerns)
- c) *Pre-ulcer callous* (i.e. callous with capillary haemorrhage causing dark discolouration within the callous)
- d) *Active Foot ulcer* with or without infection
- e) *Charcot deformity* of feet

- f) *Bacterial foot infection* (not fungal) not responding to usual antibiotics (e.g. Ingrown toe nails with bacterial infection)

(9) Orthopaedics

Reference: www.patient.co.uk/patientplus.asp
Neuropathic Joints (Charcot Joints)

- Charcot osteoarthropathy and osteomyelitis are examples of Diabetic Foot conditions requiring Orthopaedic input.

(10) Neurology

Reference: www.medscape.com
Citing Article:
Diabetic Neuropathy – A Review
Nature Clinical Practice Neurology 2007;3(6):331-340.

- In symptomatic diabetic neuropathy, there is slowing of nerve conduction velocity owing to demyelination and loss of large myelinated fibers, and a decrease in nerve action potentials owing to loss of axons.
- Systematic electrophysiological testing is not necessary in diabetic patients with typical peripheral neuropathy.
- Nerve conduction studies (NCS) are the most objective noninvasive measures of nerve function.
- The sensory action potential is altered only after involvement of larger myelinated fibers, which is often a late event in patients with diabetes.
- Electrophysiological data must, therefore, always be evaluated in a clinical context.

(11) Cholesterol

Reference: www.bpac.org.nz
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- Dyslipidaemia should be discussed and, where appropriate, statin treatment initiated. The optimal lipid management targets for patients with diabetes are:
 - LDL cholesterol < 2.0mmol/L; this is the primary lipid indicator for management of cardiovascular risk
 - HDL cholesterol ≥ 1.0 mmol/L
 - Total cholesterol (TC) < 4.0 mmol/L
 - TC:HDL ratio < 4.0
 - Triglycerides < 1.7 mmol/L

(12) Aspirin

Reference: www.health.govt.nz
Cardiovascular Disease Risk Assessment Updated December 2013

New Zealand Primary Care Handbook 2012

- Aspirin and other antiplatelet agents are not generally recommended for people with a five-year combined cardiovascular (CVD) risk lower than 20 percent.
- Antiplatelet therapy for people with combined CVD risk over 20 percent but without established cardiovascular disease.
 - Aspirin can be considered for these high-risk primary prevention people, taking into account harms and benefits
- Antiplatelet therapy for people with established cardiovascular disease.
 - Antiplatelet therapy is strongly recommended for people with established cardiovascular disease
- Aspirin contraindications.
 - Aspirin allergies/intolerance, active peptic ulceration, uncontrolled BP and other major bleeding risks

Reference: www.nzssd.org.nz
New Zealand Society for the Study of Diabetes (NZSSD)

- CVD Risk Assessment Calculator for people with Type 2 Diabetes in New Zealand (on NZSSD website) can be used to determine a patient's 5-year CVD risk.
- This percentage may be used to determine whether a Type 2 Diabetes patient should be started on aspirin.

(13) Vascular Team

Reference: www.bpac.org.nz
Screening and Management of the Diabetic Foot
Best Practice October 2010

- Criteria for referral to a vascular surgeon for a patient with a diabetic foot complication includes the following:
 - Foot lesion (ulcer, gangrene) or suggestion of rest pain with peripheral arterial disease
 - Deteriorating ulcer with known peripheral arterial disease or absent pedal pulses
 - Ankle Brachial Index <0.5 or absolute ankle pressure <50 mmHg
 - New foot lesion with previously treated peripheral arterial disease
 - Symptomatic intermittent claudication at <200 m
 - Acute diabetic foot sepsis
 - Osteomyelitis of forefoot or metatarsals
 - Acute osteomyelitis

(14) Immunisation – Pneumovax23

Reference: www.bpac.org.nz
Best Practice April 2011

- Pneumovax23 has an overall efficacy of 60-70% in adults, i.e. it will prevent pneumococcal illness in 60-70% of people who are vaccinated. Efficacy is much higher in healthy populations but people who are immunodeficient or have

chronic health conditions do not consistently develop immunity after vaccination. The duration of effectiveness of Pneumovax23 in this group is unclear.

- Consider vaccination with Pneumovax23 in people with Diabetes.

Reference: www.bpac.org.nz
Best Practice March 2013

- Healthy people aged over 65 years generally require only a single dose of Pneumovax23, but those at high risk should receive a second dose three to five years after their first dose.
- Adults with these conditions/treatment are considered high risk
 - People with a history of invasive pneumococcal disease
 - Functional or anatomical asplenia, e.g. sickle cell disease or splenectomy
 - Chronic illness, e.g. chronic cardiac, renal or pulmonary disease, diabetes or alcoholism
 - Immunocompromised, e.g. nephritic syndrome, lymphoma and Hodgkin's disease, HIV
 - Cerebrospinal fluid leak
 - Cochlear implants

(15) Depression

Reference: www.bpac.org.nz
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- Depression is twice as prevalent in people with type 2 diabetes compared with the general population and should always be considered in patients who are having problems adhering to a lifestyle regimen.
- Patients with depression are less likely to adhere to dietary advice and exercise programmes and more likely to have poor glycaemic control and experience diabetes related complications.
- Depression is also associated with obesity and other psychosocial problems.

(16) Recurrent Urinary Tract Infections

Reference: www.aafp.org
Recurrent Urinary Tract Infections in Women: Diagnosis and Management
September 15, 2010

- Diabetes mellitus, neurologic conditions, chronic institutional residence, and chronic indwelling urinary catheterization are important predisposing factors for complicated UTIs.

(17) Recurrent Bacterial Skin Infections

Reference: www.dermnet.org

Bacterial skin infections. Folliculitis & furunculosis

- In recurrent cases, take swabs from active lesions and nostrils to determine antibiotic sensitivity. Consider predisposing causes:
 - Climatic conditions (humidity, occlusive clothing)
 - Underlying skin disease (atopic dermatitis, hidradenitis suppurativa)
 - Iron deficiency
 - Diabetes mellitus
 - Defective neutrophil function (treated with oral vitamin C)
 - Immunodeficiency, including hypogammaglobulinaemia and HIV infection