Diabetes Type II in Adults

CASE DEFINITIONS

Diabetes

A chronic and progressive medical condition resulting from insulin resistance and deficiency, which is often asymptomatic. More than 25% of adults in some Kimberley communities have diabetes.

HbA1c can be used for screening, diagnosis and ongoing monitoring of diabetes (see FLOWCHART on pg 4).

Interpretation of Screening HbA1c			
	Normal	**Prediabetes**	**Diabetes**
Venous HbA1c	<5.7% (<39mmol/mol)	5.7-6.4% (39-47mmol/mol)	≥6.5% (≥48mmol/mol)
POC HbA1c	<5.7% (<39mmol/mol)	If ≥5.7% send venous sample to lab. If ≥ 6.5% see probable diagnosis below.	

Confirmed Diagnosis

- Venous HbA1c ⩾6.5% on one occasion.

Probable Diagnosis

- POC HbA1c ≥6.5% or
- Random capillary glucose ≥11.1 mmol/L.
- Commence education and initial management while waiting for confirmation with venous HbA1c and random venous glucose (collect as soon as possible). Arrange GP follow up.

Prediabetes

A term used to describe people with higher than normal blood glucose levels, who do not yet have diabetes. These people are at increased risk of developing diabetes and cardiovascular disease. Prediabetes is associated with obesity, high cholesterol and high blood pressure.

SCREENING

Early diagnosis and glycaemic control can prevent complications and improve long-term outcomes. Screen asymptomatic adults annually with HbA1c.

Screen Annually

Screen ALL Aboriginal adults ≥ 15 years annually with point-of-care or venous HbA1c

(MBS funds one sample per year for screening)

Non-Aboriginal adults ⩾40 years should be screened every 3 years with AUSDRISK tool (test with HbA1c if score ⩾12).

For recommendations for children at risk of diabetes, see TYPE II DIABETES IN CHILDREN protocol. Refer to DIABETES IN PREGNANCY protocol for pregnant patients.

ASSESSMENT

When delivering a diabetes diagnosis or changing medications involve an Aboriginal Health Worker or Practitioner to assist with education & support.

Baseline Diabetic Assessment	
Examinations	**Investigations**
BMI & waist circumference BP Cardiovascular risk assessment & examination Visual acuity Foot examination	UEC, LFT, Lipids HbA1c Urinalysis Urine ACR ECG Retinal screening

Assign an electronic diabetes careplan on diagnosis.

Register for the NDSS. Consider fitness to drive (see AustRoads: Assessing Fitness to Drive).

PRINCIPLES OF MANAGEMENT

Prediabetes & Diabetes

Those with HbA1c 6.0-6.4% (42-47mmol/mol) are at very high risk for progression to diabetes – intensive lifestyle intervention and vigilant follow up is required

See HEALTHY LIVING protocol

- Use motivational interviewing to encourage lifestyle change and assess stage of change
- Advise 5-10% loss of initial body weight if overweight
- Assess cardiovascular risk factors and manage to reduce risk
- Follow up people with high risk prediabetes and diabetes (at least 3 monthly)
- Offer referral to allied health professionals: diabetes educator, dietitian, intensive lifestyle intervention program if available
- Avoid or minimise use of glycaemic drugs (eg thiazides, steroids, psychotropics)

Targets

- HbA1c ⩽7% (⩽53mmol/mol)(individualise as necessary)
- Lipids: TC <4, TG<2, HDL >1, LDL <1.8 mmol/L
- BP ⩽ 130/80
- BMI <25 kg/m2
- Waist circumference: F <80cm, M<94cm
- Urine ACR: <3 mg/mmol
- Vaccination: annual influenza; 23-valent pneumococcal vaccine at diagnosis if not given in last 5 years (3 lifetime doses) (see Australian Immunisation Handbook)
- Smoking cessation
- Nutritional advice and dietary modification
- Alcohol ⩽2 standard drinks/day
- Physical activity (moderate) ⩾30 minutes on most days

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THERAPEUTIC PROTOCOLS FOR DIABETES

- Carefully review adherence on existing therapy before making changes
- Review non-pharmacological management at every opportunity
- Ask about side effects of medications including hypoglycaemia and gastrointestinal effects
- If not at target, or if reduction in HbA1c is less than 0.5% after 3 months: consider intensifying therapy
- Consider stopping any therapies that fail to improve glycaemic control
- If HbA1c is extremely high (e.g. ≥12% (108 mmol/mol)), insulin is the only agent proven to reduce glycaemia to target: consider use as first line therapy in this context

ORAL HYPOGLYCAEMIC AGENTS (OHAs)

First line: Metformin (biguanide)

- Commence 500mg XR daily (or 500mg IR twice daily)
- Uptitrate to maximum 2g daily (XR) over four weeks
- Withhold in sepsis, MI, critical illness, prior to contrast administration, or acute kidney injury

Second line: ADD one of

- **Gliclazide 30mg MR daily (sulfonylurea):** double dose every four weeks to maximum 120mg daily – monitor for hypoglycaemia & consider risk before prescribing
- **Sitagliptin 100mg daily (DPP-4 inhibitor):** available in combination with metformin as 50mg/1000mg XR or 100mg/1000mg XR for daily use (consider to reduce pill burden)
  OR linagliptin 5mg daily: does not require dose adjustment in renal impairment
  (NB: linagliptin/metformin combination contains immediate release metformin, and is not on KSDL)
- **Empaglifozin 10mg daily (SGLT2 inhibitor):** can be used in dual or triple oral therapy, or with insulin, in suitable patients. Maximum dose 25mg daily.

  Use of empagliflozin in the Kimberley requires careful patient selection, consideration of individual risk/benefit profile and patient counselling on potential adverse effects (see below).

  Consider seeking physician advice before commencing.

Important information regarding empagliflozin:

This class poses risk of significant adverse effects including:

- Dehydration due to diuretic effect (therefore potential risk to renal function)
- Euglycaemic ketoacidosis
- Genital and urinary infections
- Increased foot amputations

There are however potential benefits for patients with known cardiovascular disease (cardioprotective effect).

Suitable patients must:

- Have eGFR >45 and be able to have renal function monitoring
- Be able to withhold drug in situations that cause risk of ketoacidosis e.g. acute serious illness, prolonged fasting, bowel preparation, low carbohydrate intake, excessive alcohol intake, and peri-operatively
- Stop drug three days before surgery and restart when eating and drinking normally
- Avoid dehydration and maintain good genital hygiene
- Not be on a GLP-1 agonist (combination not subsidised)

Practice points:

- Check capillary ketones in any unwell patient on an SGLT2 inhibitor. If capillary ketones >0.6 mmol/mol consider euglycaemic ketoacidosis and call the on-call Kimberley regional physician for advice.

Dose adjustment in chronic renal impairment	
Metformin	eGFR 30-45 max 1g/day; eGFR <30 cease, or discuss with nephrologist/on-call physician
Gliclazide	Increased risk of hypoglycaemia in CKD eGFR 45-60 reduce dose; eGFR <45 cease, or discuss with nephrologist/on-call physician
Sitagliptin	eGFR 30-45 50mg daily; eGFR <30 25mg daily
Empaglifozin	eGFR >45 10mg daily (max 25mg, although may not offer additional benefit); eGFR <45 cease

Third line: if patient remains above target on two agents, then an alternate 2nd line OHA may be added as a third agent.

INJECTABLE AGENTS

Dulaglutide is a GLP-1 agonist that is delivered as a once weekly subcutaneous injection. The device is a pre-filled autoinjector pen that does not need to be pre-mixed and has a small non-visible needle.

Change patients on exenatide (Bydureon®) to dulaglutide (Trulicity®) by commencing dulaglutide when next injection. Change patients to dulaglutide (Trulicity®) as it requires less preparation prior to injection.

Before starting: cease sitagliptin/linagliptin.

How to start: commence at 1.5mg s/c once a week (either teach self- injection technique, or patient can attend clinic for weekly injection according to their preference).

Practice points:

- Do not use if eGFR <15
- Monitor for gastrointestinal effects: may improve with time on agent
- Advise patient to report abdominal pain: check lipase and consider pancreatitis in this scenario
- Adverse effects include rare but serious cases of pancreatitis: consider past history of pancreatitis and do not use if high risk of pancreatitis

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- Can be kept out of the fridge for up to two weeks at 30 degrees Celsius
- Administration day can be changed provided there is at least three days between doses
- Contraindicated if family or personal history of medullary thyroid cancer or MEN2

INSULIN

Consider insulin as part of first line therapy if HbA1c is extremely high (e.g. ≥12%). Insulin should be added if not at target on triple oral therapy, or oral therapy and dulaglutide.

Before starting: refer to diabetes educator, educate on insulin storage, administration, monitoring & hypoglycaemia.

How to start: glargine insulin

- Continue OHAs & dulaglutide at same dose; consider reducing dose of gliclazide based on individual patient factors
- Commence at 10 units subcutaneously at the same time every day
- Review at least weekly and monitor for hypoglycaemia
- Increase dose by 2-4 units as often as every three days, titrating to fasting glucose target
- Targets: morning fasting glucose 6-8 mmol/L, 2 hours after meals 6-10 mmol/L

FOLLOW UP

3 monthly:

- HbA1c: use POC HbA1c for same day results
- UEC & urine ACR
- BP, weight, BMI, waist circumference, foot check
- Provide ongoing diabetes education
- Review lifestyle changes, medications, side effects, adherence
- Assess for complications and comorbidities including depression, ischaemic heart disease, burden of self-management
- Ask about intercurrent illness

Annually:

- Eye check: screening with visual acuity and retinal photography for those without retinopathy; those with retinopathy should have regular review with optometry/ophthalmology
- Full foot assessment (see below)
- ECG & systems review
- Vaccination review: influenza, pneumococcal, tetanus
- Calculate overall cardiovascular risk
- Pathology: LFT, lipid profile (as well as HbA1c, UEC & urine ACR), B12 if on metformin

WOMEN OF CHILD BEARING AGE

If pregnancy is being contemplated: See DIABETES IN PREGNANCY protocol.

If pregnancy is not being contemplated: ensure reliable form of contraception is being used.

REFER / DISCUSS

Diabetes Educator

Available via Boab Health (based in the Kimberley) and Diabetes WA (via telehealth)

Kimberley Regional Physician Team

- Poor glycaemic control despite recommended management e.g. on three lines of therapy; insulin dose >100 units/day
- Unexplained hypoglycaemic episodes, multiple complications and/or comorbidities
- Any questions about medications, especially new or less familiar medications e.g. dulaglutide, empagliflozin
- Suspected type 1 or autoimmune mediated diabetes eg rapid-onset hyperglycaemia, weight loss, polyuria/polydipsia, other concerns

FOOT CARE

Perform foot examination at baseline and at least annually and stratify according to risk as below. Review skin, nails, deformity, pulses, sensation to monofilament and footwear.

If LOW risk: examine annually (does not need podiatry)

If HIGH risk: examine 3 monthly AND refer to podiatrist via Boab Health (see Podiatry High Risk Foot Referral Pathway, including for support with active foot ulcers)

Foot Check		
	LOW RISK (all of)	HIGH RISK (any of)
Pedal pulses	Present	Absent
Sensation with monofilament	Present	Absent
Callus	Absent	Present
Ulcers	Absent	Present or history of
Foot deformity	Absent	Present
Amputation	Absent	Present

RESOURCES

For Diabetes Emergencies see:

Hyperglycaemia: RACGP & ADS Emergency management of hyperglycaemia in primary care

Mild/moderate hypoglycaemia: RACGP General Practice Management of Type 2 Diabetes (Appendix J)

Severe hypoglycaemia: RACGP General Practice management of Type 2 Diabetes (Glycaemic Emergencies)

Boab Health: Referral Pathways

MBS Billing Codes for POC HbA1c in Aboriginal Medical Services:

Screening 73839

Monitoring 73840

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Flowchart