

# DIABETES TYPE II

## Screening

### Annually:

- all Aboriginal people over 15; children over 10 at risk (> 120% ideal weight, acanthosis nigricans).
- people with impaired glucose tolerance (IGT) or impaired fasting glucose (IFG) or at high risk.

### Every 3 years:

- Non Aboriginal adults over 45 years of age.

### How to Screen

- Venous glucose (random or fasting) if doing other tests

### OR

- Random capillary glucose (fingerprick).

\*\* See flow chart on page 3 of this protocol \*\*

## Case Definition

**Diagnosis MUST be confirmed with a laboratory tested venous blood sample (all figures are in mmol/l).**

A high reading is a fasting venous blood glucose (FBG)  $\geq 7$  or random venous blood glucose (RBG)  $\geq 11.1$  (or capillary  $\geq 12.2$ ).

### DIABETES MELLITUS (DM):

**without symptoms:** 2 high readings on separate occasions including at least one venous reading

**OR** venous blood glucose > 20 mmol/L without cause (e.g. acute illness, steroids).

**with symptoms (eg thirst, urinary frequency):**

1 high venous reading.

See screening flow chart overleaf for indications for 75g oral glucose tolerance test (**75g OGTT**).

Interpretation of OGTT:

OGTT	Diabetes Unlikely	Impaired Fasting Glucose	Impaired Glucose Tolerance	Diabetes Likely
Fasting	< 5.5	5.5 - 6.9 and	< 7 and	$\geq 7$ or
2 hour post 75g	< 7.8	< 7.8	7.8 - 11	$\geq 11.1$

## Principles of Management

- See [HEALTHY LIVING](#) protocol.
- Every visit encourage appropriate lifestyle changes e.g. **increase physical activity, weight loss, smoking cessation and alcohol reduction.**
- Offer individual education and dietary consultation with appropriately trained health professional (e.g. Diabetes Educator, Dietician).
- People with IFG and IGT are at high risk of developing diabetes and following [HEALTHY LIVING](#) advice will decrease the risk of progression.
- Avoid or minimize the use of glycaemic drugs (thiazides, steroids, olanzapine).

### BASELINE EXAMINATIONS:

- BMI and waist circumference (WC).
- BP.
- Visual acuity (VA).
- Foot examination (see 'FOOT CARE' over).
- Carotid examination.

### BASELINE INVESTIGATIONS:

- ECG.
- BLOODS: creatinine, electrolytes, eGFR, lipids, LFTs, TSH, HbA1c.
- URINE: dipstick and ACR.
- Retinal screening.

### AIMS OF MANAGEMENT:

**Remember, there is a clinical benefit for improving all parameters even if target is not met.**

- HbA1c < 7%.
- Total cholesterol < 4mmol/L.
- HDL > 1mmol/L, TG < 2 mmol/L, LDL < 1.8 mmol/L.
- BP < 125/80.
- BMI 17 - 25kg/m<sup>2</sup>.
- Waist Circumference: < 100cm.
- NO smoking.
- Alcohol 2 standard drinks / day maximum.
- Exercise  $\geq 20$  minutes walking  $\geq 4$  days / week.
- ACR < 3.5mg/mmol.

## Therapeutic Protocols

- Before starting or increasing medication review [HEALTHY LIVING](#).
- Healthy eating, increased physical activity and attempts at weight loss are central to ideal control for all diabetics.
- **Before increasing medication carefully review adherence to existing therapy.**
- Ensure **influenza** and **pneumococcal** vaccines are up to date.

When titrating therapy:

- Check morning fasting capillary glucose (or random clinic capillary glucose if fasting is not possible) preferably at least weekly.
- If on medications other than metformin ask about symptoms of hypoglycaemia.

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## Therapeutic Protocols (cntd)

Consider aspirin 100mg daily (see [CORONARY ARTERY DISEASE](#) protocol).

Consider statin in all people with diabetes for cardiovascular risk reduction (see [DYSLIPIDAEMIA](#) protocol).

### Hypoglycaemic medications

**1st line: Metformin** 1g daily: EITHER 500mg BD **OR** XR preparation 1g daily, increasing over 2 weeks to maximum dose of EITHER 1g BD or XR preparation 2g once daily.

Show Metformin preparations to patient and discuss:

- Metformin: bd dosage, higher risk of GI side effects, smaller tablets (500mg) or fewer tablets (1g tablets).
- Metformin XR – daily dose, larger tablet, less GI irritation.

### PRECAUTIONS:

- Estimated glomerular filtration rate (**eGFR**):  
< **60** mL/min/1.73m<sup>2</sup>, maximum metformin dose 1g daily.
- STOP **metformin** if patient septic, AMI, acutely unwell or eGFR < **30** mL/min/1.73m<sup>2</sup>.

**2nd line: Check adherence to therapy; if adhering and not well controlled:** Add **gliclazide MR** 30mg daily, doubling dose every 4 weeks to maximum of 120mg daily.

**3rd line: Check adherence to therapy, if adhering and not well controlled:**

(a) Commence **insulin**. See next column.

**OR** (i.e. INSTEAD of insulin, and NOT with insulin).

(b) Commence **pioglitazone** if patient declines or is unsuitable for insulin, and has no contraindications. Start pioglitazone 15mg daily. Review BSL readings twice a week, and if necessary, increase dose to 30mg after 6 weeks. Continue BSL reviews and after a 3monthly HbA1C check, increase dose to 45mg daily (maximum dose) if necessary

- Absolute CONTRAINDICATIONS include Heart Failure and known CAD.
- Use with caution if high risk of CAD.
- Do not use as an add-on to insulin.

**NB:** clients currently established on rosiglitazone should be discussed with the Regional Physician to determine the relative benefits and disadvantages for that individual of substituting rosiglitazone with pioglitazone, or alternatively, to consider substitution of the glitazone with insulin.

### INSULIN

...is recommended if maximal oral therapy fails to achieve glycaemic control: **HbA1c > 7.5% especially with significant complications** – retinopathy, kidney disease, neuropathy, vascular disease or symptomatic hyperglycaemia.

### BEFORE STARTING:

- Patient/carer needs education about:
  - insulin storage.
  - insulin administration.
  - recognition and management of hypoglycaemia.
  - home monitoring using a glucometer is ideal, however clinic monitoring may be all that is possible.
- Encourage patient to speak with someone already using insulin.
- Patient will require access to a secure fridge / or clinic fridge.

### How to start:

- Continue **metformin** at current doses. Continue gliclazide at current doses (unless pregnant).
  - Use a once daily regimen:
    - 1) **isophane insulin** (e.g. **Protaphane Innolet**) – evening only.
      - if managing self monitoring and low risk of hypoglycaemia.
      - if pregnant or contemplating pregnancy.
- OR**
- 2) **glargine insulin** - anytime at about the same time each day.
    - if problems with home monitoring or insulin storage.
    - if unreliable food availability or home situation.

### Starting dose:

- 10 units subcutaneously; protophane at night or glargine at a regular time each day.
- Review weekly.
- Aim for morning fasting glucose of < 6 mmol/L or non-fasting glucose levels < 8.
- Increase dose by 2-4 units every three days until glycaemic control is achieved.

## Follow-up

**3 monthly** - Ask about medicines, symptoms of coronary artery disease (see [CORONARY ARTERY DISEASE](#) protocol), diet, smoking and exercise.

- Check weight, BP, WC, feet (see 'FOOT CARE' over), HbA1c.

**Annually** - creatinine, electrolytes, eGFR, lipids, LFTs, visual acuity, urine ACR and foot review (see 'FOOT CARE' over).

**At least every 2 years** - retinal screen (if diabetic retinopathy follow Ophthalmologist's advice).

**Every 2 years** - ECG.

## Women of Child Bearing Age

See [DIABETES IN PREGNANCY](#).

### If pregnancy is being contemplated:

- Aim for HbA1c < 6% before conception.
- Commence **folic acid 5mg** daily.
- Pregnancy accelerates diabetic retinopathy. Conduct retinal screening if a normal screen has not been documented in the last 12 months.

### If pregnancy is not being contemplated:

- Ensure reliable form of contraception is being used. Consider tubal ligation for women who have finished child bearing.

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## Refer / Discuss

### RENAL PHYSICIAN:

- eGFR < 30ml/min (see [CHRONIC KIDNEY DISEASE](#)).
- ACR > 100mg/mmol (see [PROTEINURIA and eGFR > 60 Protocol](#)).

### PHYSICIAN:

- Inadequate control of diabetes despite maximum / optimal medication.
- Total dose of **insulin** 150 units / day without improved glycaemic control.
- Unexplained hypoglycaemic episodes, multiple complications and / or comorbidities.

### OPHTHALMOLOGIST:

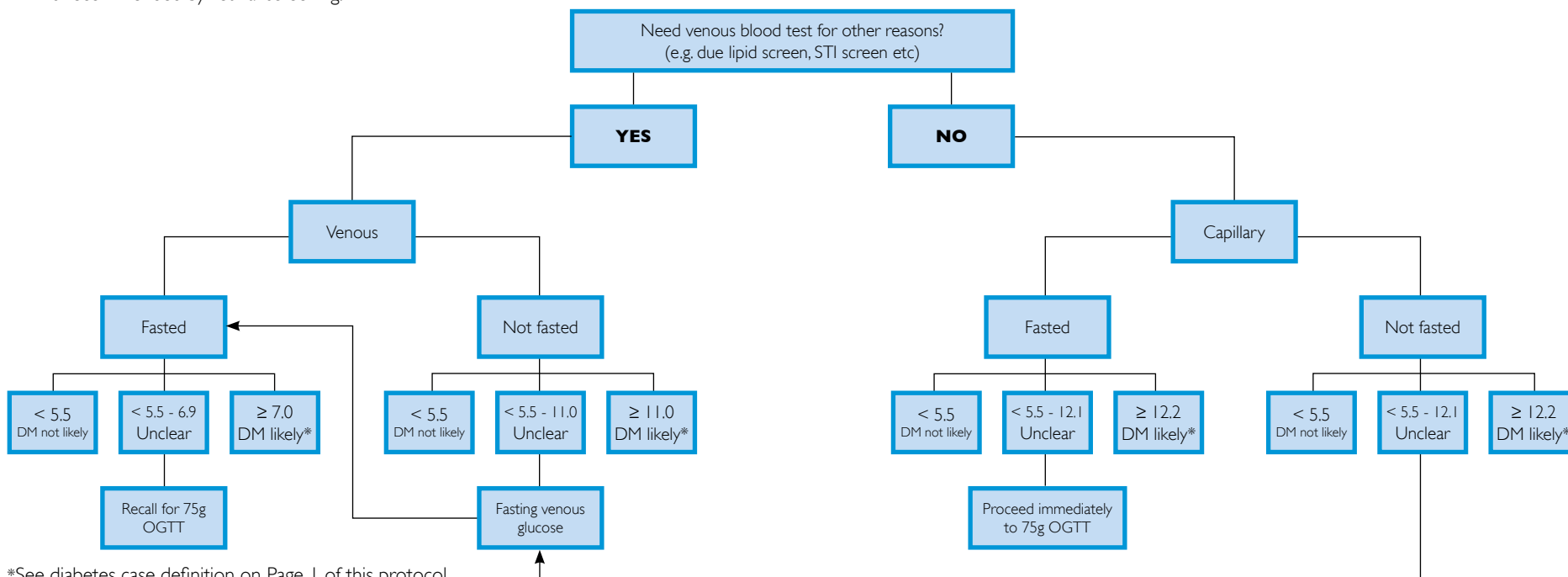
- As recommended by retinal screening.

### FOOT CARE

Perform foot examination at baseline and annually, and stratify according to risk as below. If **LOW** risk - examine annually (does NOT need to see podiatrist). If **HIGH** risk - examine 3 monthly **and** to see Podiatrist annually.

	LOW RISK (ALL OF)	HIGH RISK (ANY OF)
Pedal Pulses	present	absent
Sensation (with Monofilament)	present	absent
Callus	absent	present
Ulcer/s	absent	present or Hx of
Foot deformity / Amputation	absent	present

### DIABETES SCREENING FLOW CHART



\*See diabetes case definition on Page 1 of this protocol