

## Diabetes Diagnosis

**People who should be screened for diabetes include:**

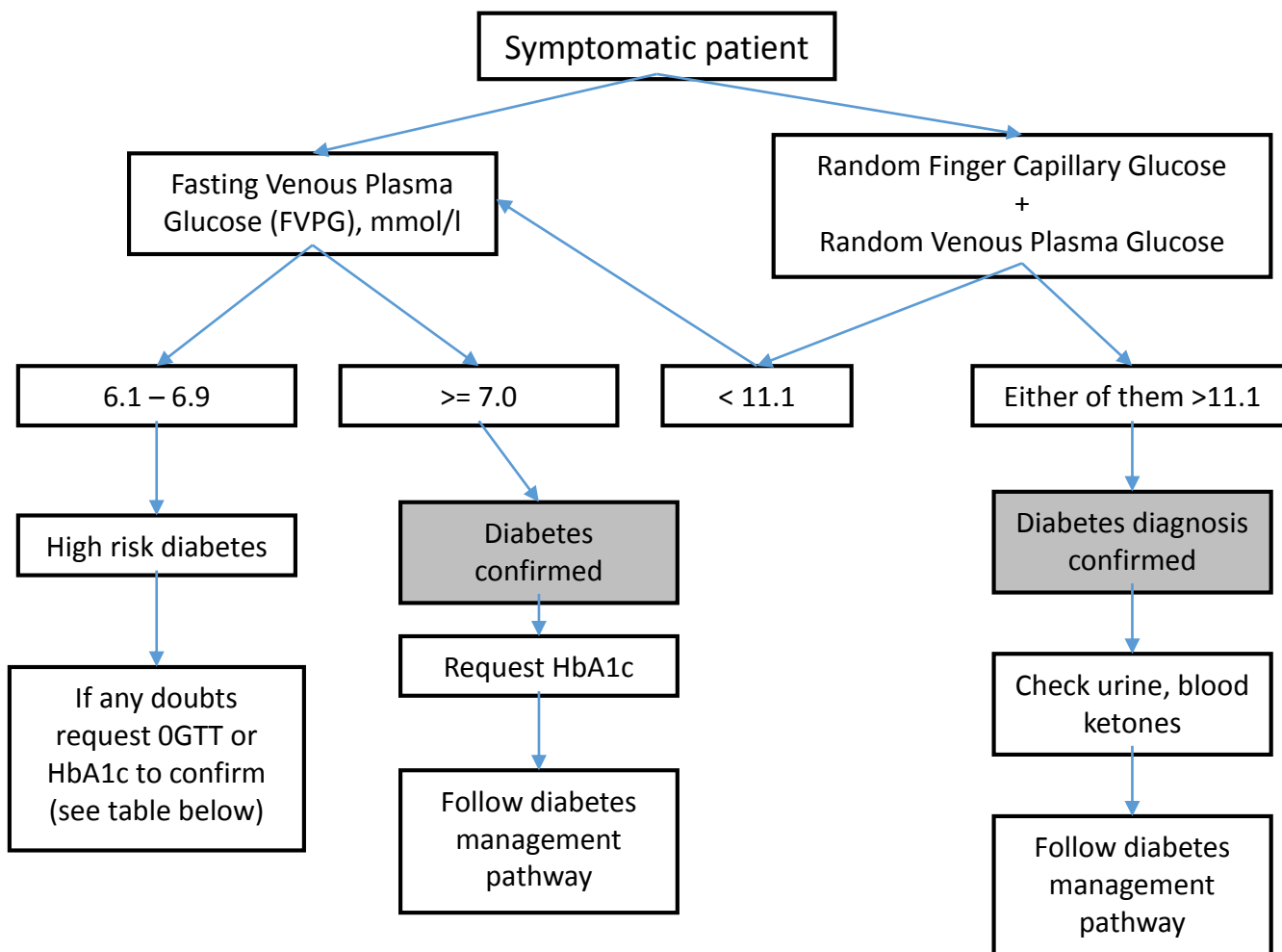
- Caucasians aged over 40 years
- High risk ethnic minorities (South Asian, Chinese, African-Caribbean or Black African descent) aged over 25
- Ethnic minorities (African American, Alaska Native, American Indian, Asian American, Hispanic/Latino, or Pacific Islander American)

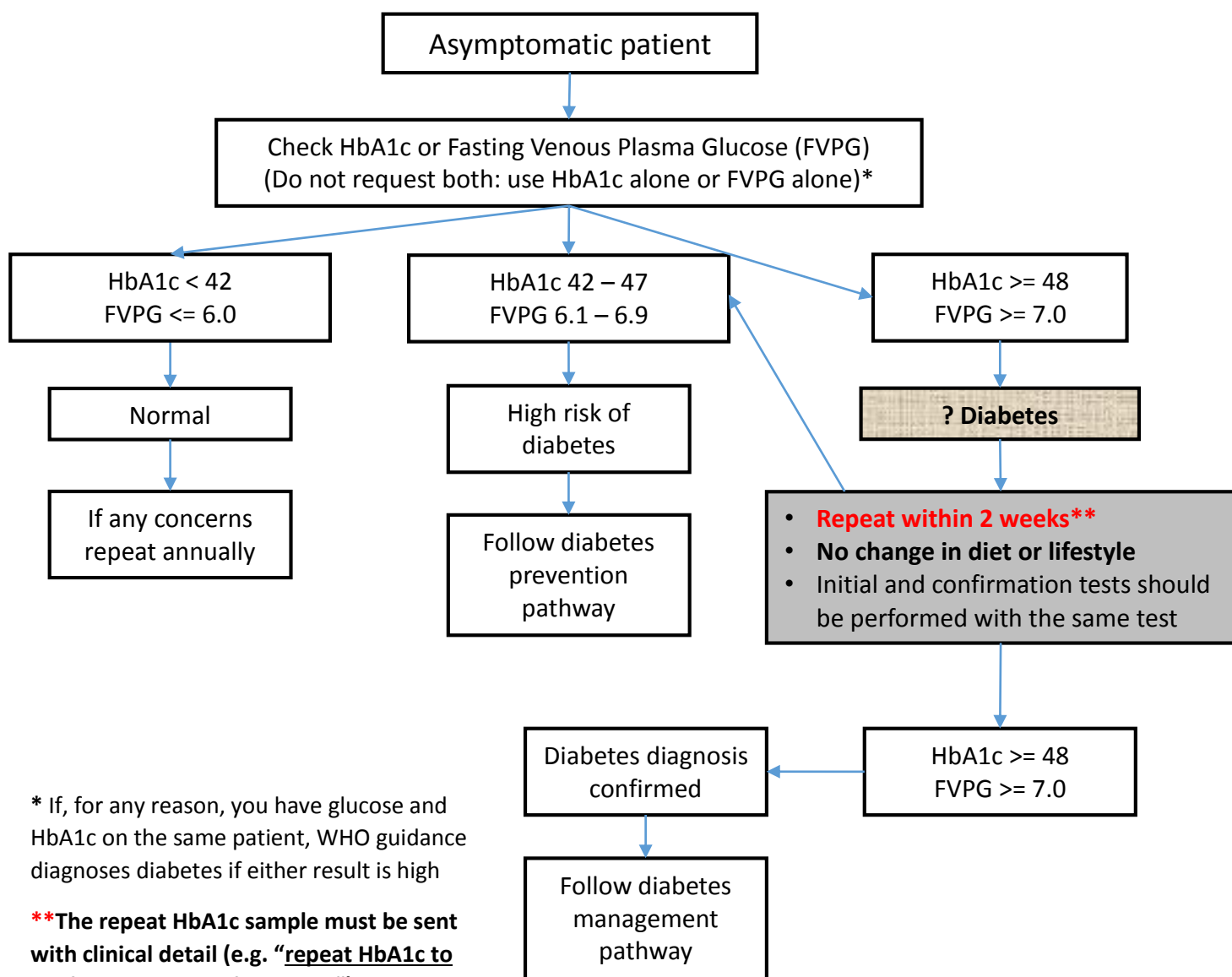
**with one or more of the following:**

- BMI > 30 or > 27.5 for people of South Asian or Chinese descent
- First degree relative with type 2 diabetes
- On glucocorticosteroids, anti-psychotic or anti-retrovirals
- Established CVD
- Hypertension
- Physical inactivity
- History of gestational diabetes, macrosomia
- Polycystic ovary syndrome
- Acanthosis nigricans
- Abnormal lipid profile (↑TGs and/or ↓HDL)
- Mental health conditions or learning difficulties
- Glycosuria on routine screening

**Symptoms**

- Polydipsia
- Polyuria
- Nocturia
- Lethargy
- Weight Loss
- Pruritis Vulvae
- Balanitis
- Blurred Vision
- Recurrent sepsis





\* If, for any reason, you have glucose and HbA1c on the same patient, WHO guidance diagnoses diabetes if either result is high

**\*\*The repeat HbA1c sample must be sent with clinical detail (e.g. “repeat HbA1c to confirm diagnosis of Diabetes”), as repeats within 60 days may be rejected by the laboratory**

**Diagnostic criteria for diabetes mellitus and high risk of diabetes**

		Fasting Plasma Glucose mmol/l	2 hour plasma glucose, mmol/l	Random plasma glucose, mmol/l	HbA1c, mmol/mol
<b>Normal</b>		≤6.0	<7.8	<11.1	<42
<b>High risk of diabetes</b>	<b>Impaired Fasting Glucose (IFG)</b>	6.1-6.9	<7.8	-	-
	<b>Impaired Glucose Tolerance (IGT)</b>	<7.0	7.8-11.0	-	-
		6.1-6.9	-	-	42-47
<b>Diabetes</b>		≥7.0	≥11.1	≥11.1	≥48

**HbA1c should not be used in the following circumstances:**

- Children and young adults <18 years
- Pregnancy
- Acute onset of diabetes symptoms
- Symptoms suggesting Type 1 diabetes (any age)
- Anaemia – HbA1c should not be used if haemoglobin under 10 g/dl
- Short duration of diabetes symptoms for less than 2 months
- Patients in whom you suspect diabetes who are acutely ill
- Patients taking medications that may elevate glucose acutely (steroids, antipsychotics)
- Acute pancreatic disease / surgery
- Abnormal haemoglobins (haemoglobinopathies/traits)
  - *However, most haemoglobin traits do not affect the level of HbA glycation or its analytical quantitation. In particular, Sickle Cell trait and HbA/HbC, HbA/HbD, HbA/HbE heterozygotes do not interfere with HbA1c analysis and the result is valid*
  - *Thalassaemia  $\alpha$  and  $\beta$  do not interfere with HbA1c analysis and the result is valid*
  - *Rarer haemoglobinopathies including homozygous sickle cell and complex thalassaemia/haemoglobinopathy heterozygotes may interfere and blood glucose/OGTT are advised*

**Conditions that may preclude accurate measurement of HbA1c:**

**increased HbA1c:**

- Iron deficiency anaemia (Hb<10g/dl)
- End stage renal failure (carbamyated Hb)
- Hypertriglyceridaemia
- Hyperbilirubinaemia
- Splenectomy
- Alcoholism

**decreased HbA1c**

- Pregnancy
- Hemoglobinopathy (racial groups)
- Haemolytic anaemia
- Severe blood loss
- Splenomegaly
- Renal dialysis pts (especially treated with erythropoietin)
- Anti-retroviral therapy
- Chronic liver disease
- *Iron and Vit B12 anaemia and their treatment may raise or lower HbA1c, but the effect is small*

**REFERENCES**

1. World Health Organisation 2011. Use of glycated haemoglobin (HbA1c) in the diagnosis of diabetes mellitus. Abbreviated report of a WHO consultation. WHO Geneva.
2. ABCD position statement on haemoglobin A1c for the diagnosis of diabetes. Pract Diab Int July/August 2010 Vol. 27 No. 6
3. John WG, Hillson R, Alberti SG. Use of haemoglobin A1c (HbA1c) in the diagnosis of diabetes mellitus. The implementation of World Health Organisation (WHO) guidance 2011. Practical Diabetes. (2012); 29: 12–12a.
4. Diabetes UK: Early identification of people with, and at high risk of Type 2 diabetes and interventions for those at high risk. POSITION STATEMENT. September, 2014