



MANAGEMENT OF TYPE 2 DIABETES



KEY MESSAGES

- The estimated number of people in New Zealand with diagnosed diabetes is predicted to increase substantially in the next 20 years, from 115,000 to over 160,000.
- The prevalence of diagnosed diabetes is higher among Māori and Pacific peoples and complications are more common and more severe.
- About half the people with diabetes are thought to be undiagnosed. Many of these people will be asymptomatic.
- Lifestyle change is central to the management of all people with diabetes and requires advice on energy intake and dietary pattern, physical activity, and smoking cessation, where appropriate.
- Involving families in diabetes management planning is of particular importance to Māori and Pacific people with diabetes.
- Regular screening for renal, retinal and foot complications should occur from diagnosis of type 2 diabetes.
- Tight glycaemic control reduces the risk of and slows the progression of microvascular and macrovascular complications. A stepped approach is recommended to lower and maintain HbA1c to as close to physiological levels as possible, preferably less than 7%, without hypoglycaemia.
- Optimum blood pressure control, below 130/80 mm Hg, reduces the risk of and slows the progression of microvascular and macrovascular complications. Intensive blood pressure management is recommended in people with diabetes and overt nephropathy, microalbuminuria or other renal disease, with most requiring more than one blood pressure lowering agent.
- Any sustained reduction in both HbA1c and blood pressure is worthwhile.
- Annual cardiovascular risk assessment is recommended for all people with diabetes. The National Heart Foundation cardiovascular risk chart should be used to calculate cardiovascular risk. Clinically, people with diabetes and overt nephropathy or other renal disease are at high risk of cardiovascular disease.
- For all people with diabetes the 5-year cardiovascular risk should be less than 15% and, where possible, the goal is to achieve: total cholesterol less than 4 mmol/L; triglycerides less than 1.7 mmol/L and blood pressure less than 130/80 mm Hg.
- People with diabetes and microalbuminuria or overt nephropathy should be on an ACE-inhibitor or A2 receptor-blocker, if tolerated, to prevent disease progression.

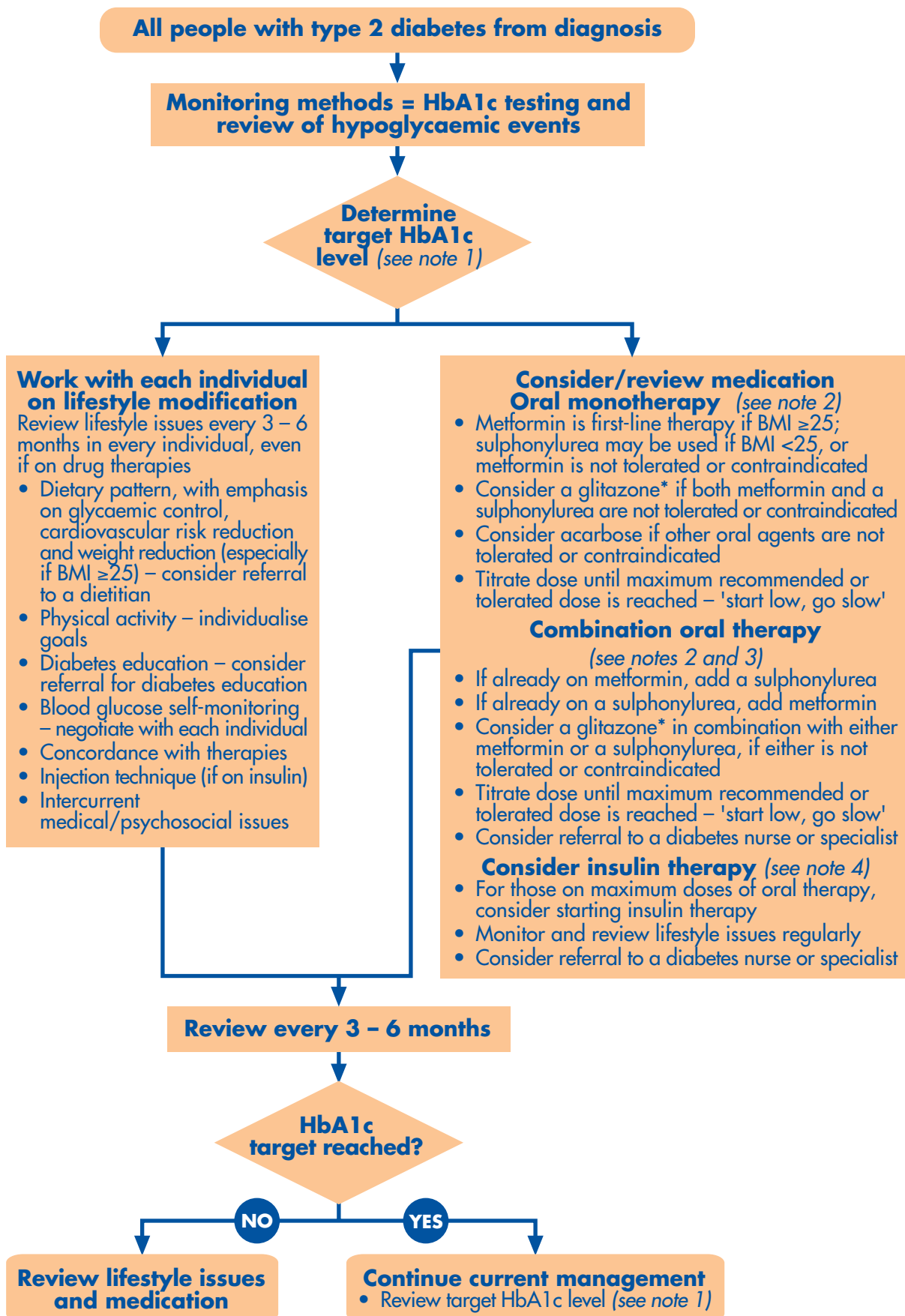
ENDORSEMENTS

This guideline has received endorsement by the following organisations:



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Figure 1: Stepwise approach to glycaemic control



For further details see the New Zealand Guideline, *Management of Type 2 Diabetes* (www.nzgg.org.nz).

*At the time of publishing, only rosiglitazone is available in New Zealand and it is not subsidised.

Note 1: Monitoring and targets

- Target HbA1c as close to physiological levels as possible, preferably less than 7%
- The lower the level of HbA1c the better; however, any sustained reduction is worthwhile
- Negotiate a target with each individual, taking into account:
 - risk factors (age, BMI, blood pressure, lipid status)
 - side effects of therapy, particularly severe hypoglycaemia
 - presence of complications of diabetes, or co-morbidities
 - patient choice
 - psychosocial circumstances
- Lower HbA1c targets are advisable:
 - in the first few years after diagnosis of diabetes
 - in the presence of complications of diabetes
 - in the presence of multiple risk factors for complications of diabetes
- Higher HbA1c targets may be advisable:
 - in those who have frequent hypoglycaemic episodes
 - in those with hypoglycaemic unawareness
 - in older people who are frail or have significant co-morbidities
 - in those at risk of severe hypoglycaemia who live alone or have poor social support.

Note 2: Oral hypoglycaemic agents

Drug class • Drug name	Starting dose	Usual maximum dose	Main contraindications	Main cautions and side effects
Biguanide				
• Metformin	500 mg twice daily	850 mg – 1g three times daily	Serum creatinine ≥ 0.15 , or creatinine clearance < 60 ml/sec Significant liver impairment Severe left ventricular dysfunction	Gastrointestinal symptoms (diarrhoea); lactic acidosis (very rare) Take in divided doses with food Start with low dose, increase gradually
Sulphonyureas (Insulin Secretagogues)				
• Glipizide	2.5 – 5 mg/day	10 mg twice daily	Significant liver impairment	Hypoglycaemia Use with caution in the elderly or in people with renal failure
• Gliclazide	40 – 80 mg/day	160 mg twice daily		
• Glibenclamide	2.5 mg/day	7.5 mg twice daily		
• Tolbutamide	500 mg/day	2 g/day		
Glitazones* (PPAR-γ agonists)				
• Rosiglitazone	4 mg/day (full effect on blood glucose may be delayed for at least 6 weeks)	8 mg/day	Cardiac failure Should not usually be considered in combination with insulin therapy	Weight gain Fluid retention Mild dilutional anaemia Check liver function at 4 – 6 weeks
Alpha-glucosidase inhibitors				
• Acarbose#	25 mg/day	50 – 100 mg three times daily		Gastrointestinal symptoms

*Not funded

#Specialist Authority only

Note: The information in this table relates to drugs available at the time of guideline publication.

Note 3: Referral to specialist diabetes nurse or physician

Referral to a specialist diabetes nurse or physician should be considered in the following circumstances:

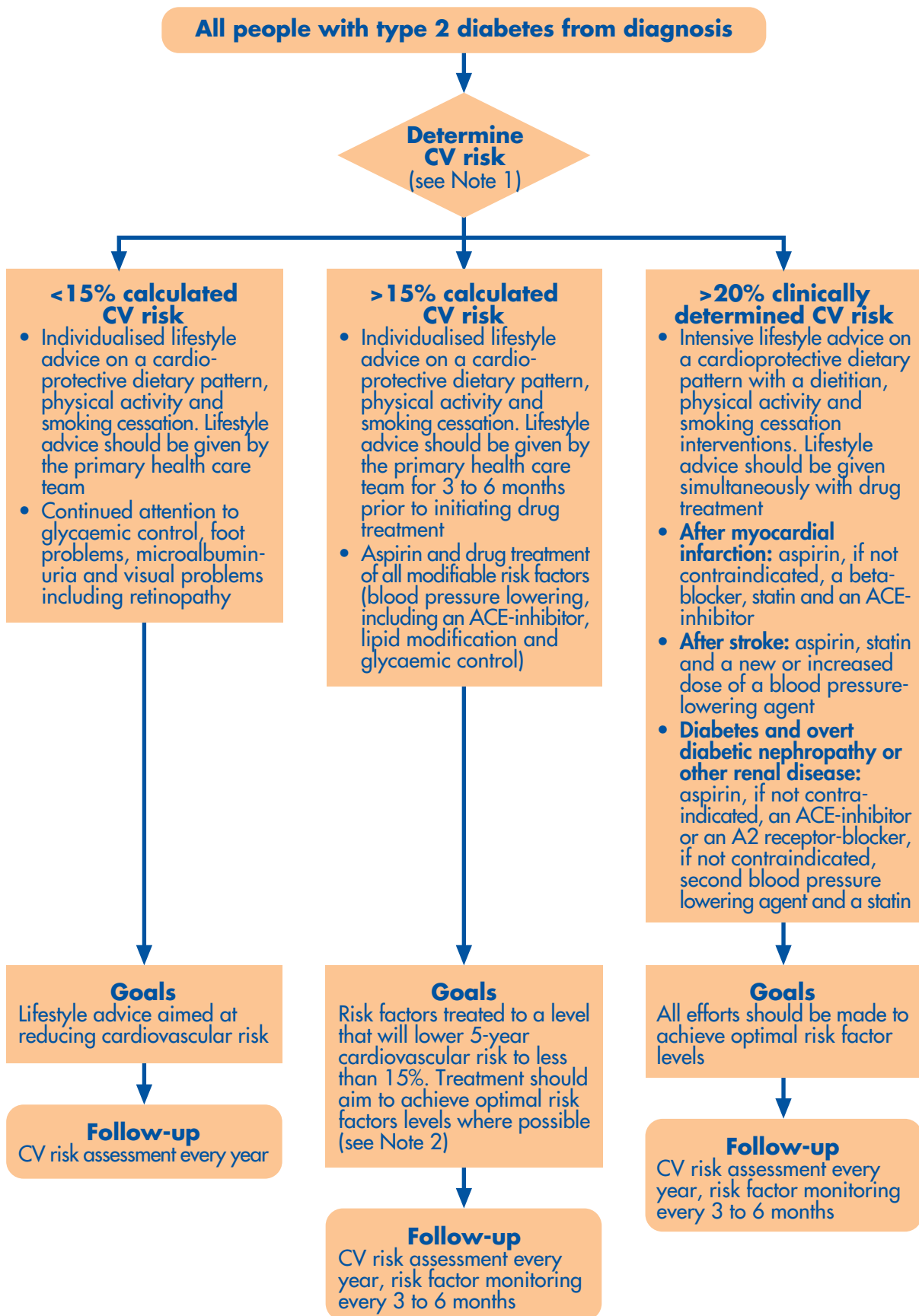
- HbA1c targets cannot be reached despite maximal drug and lifestyle therapy
- frequent or severe hypoglycaemic episodes
- complications of diabetes, especially more than one complication
- very high risk of complications (presence of multiple risk factors).

Note 4: Initiating insulin therapy in type 2 diabetes

If HbA1c is persistently above target despite maximal oral drug and lifestyle therapy, consider starting insulin therapy. It is advisable to talk to a person about starting insulin therapy well in advance of the actual need to start. This allows plenty of time for questions to be asked, and fears (particularly the fear that starting insulin means that death is imminent) to be addressed.

- Oral therapy and lifestyle management should be continued when insulin is added. If taking a sulphonylurea, the dose may need to be reduced, or it may occasionally need to be stopped.
- Start with an intermediate-acting insulin such as Protophane or Humulin N.
- If fasting glucose greater than 6 mmol/L, add an intermediate-acting insulin, 6 to 10 units given at bedtime. Progressively increase the insulin dose by 1 to 2 units every 3 to 4 days, until blood glucose targets are reached.
- If fasting glucose is normal but daytime glucose levels are above target levels, add an intermediate-acting insulin, 6 to 10 units at breakfast time. Progressively increase the insulin dose by 1 to 2 units every 3 to 4 days, until blood glucose targets are reached.
- If the HbA1c target is still not reached, the person will probably need twice daily or more frequent insulin. In this situation, referral to a specialist is strongly advised.

Figure 2: Cardiovascular (CV) risk assessment for people with diabetes



Note 1

People with diabetes are at very high-risk (5-year CV risk >20%) if they have:

- a previous history of cardiovascular disease (myocardial infarction, angina, ischaemic stroke or transient ischaemic attack)
- specific genetic lipid disorders (familial hypercholesterolaemia, familial defective ApoB or familial combined hyperlipidaemia)
- overt diabetic nephropathy or other renal disease.

All other men and women should have their absolute CV risk calculated using the National Heart Foundation's cardiovascular risk assessment chart or an electronic decision support tool

People with diabetes are assumed to be at high risk (5-year CV risk >15%) if they have total cholesterol greater than 8 mmol/L or TC:HDL ratio greater than 8 or blood pressure greater than 170/100 mm Hg.

Note 2: Optimal risk factor levels for people with diabetes

Lipid Fraction	Value	
Total Cholesterol	<4 mmol/L	
LDL Cholesterol	<2.5 mmol/L	
HDL Cholesterol	>1 mmol/L	
TC:HDL ratio	<4.5	
Triglycerides	<1.7 mmol/L	
Blood Pressure	Systolic Blood Pressure	Diastolic Blood Pressure
People with diabetes or cardiovascular disease	<130 mm Hg	<80 mm Hg
People with diabetes and overt nephropathy, microalbuminuria or other renal disease	Aggressive blood pressure control is recommended, usually two blood pressure-lowering agents including an ACE-inhibitor	
HbA1c	HbA1c as close to physiological levels as possible (aim for <7%)	

Figure 3: Identifying and managing diabetic renal disease

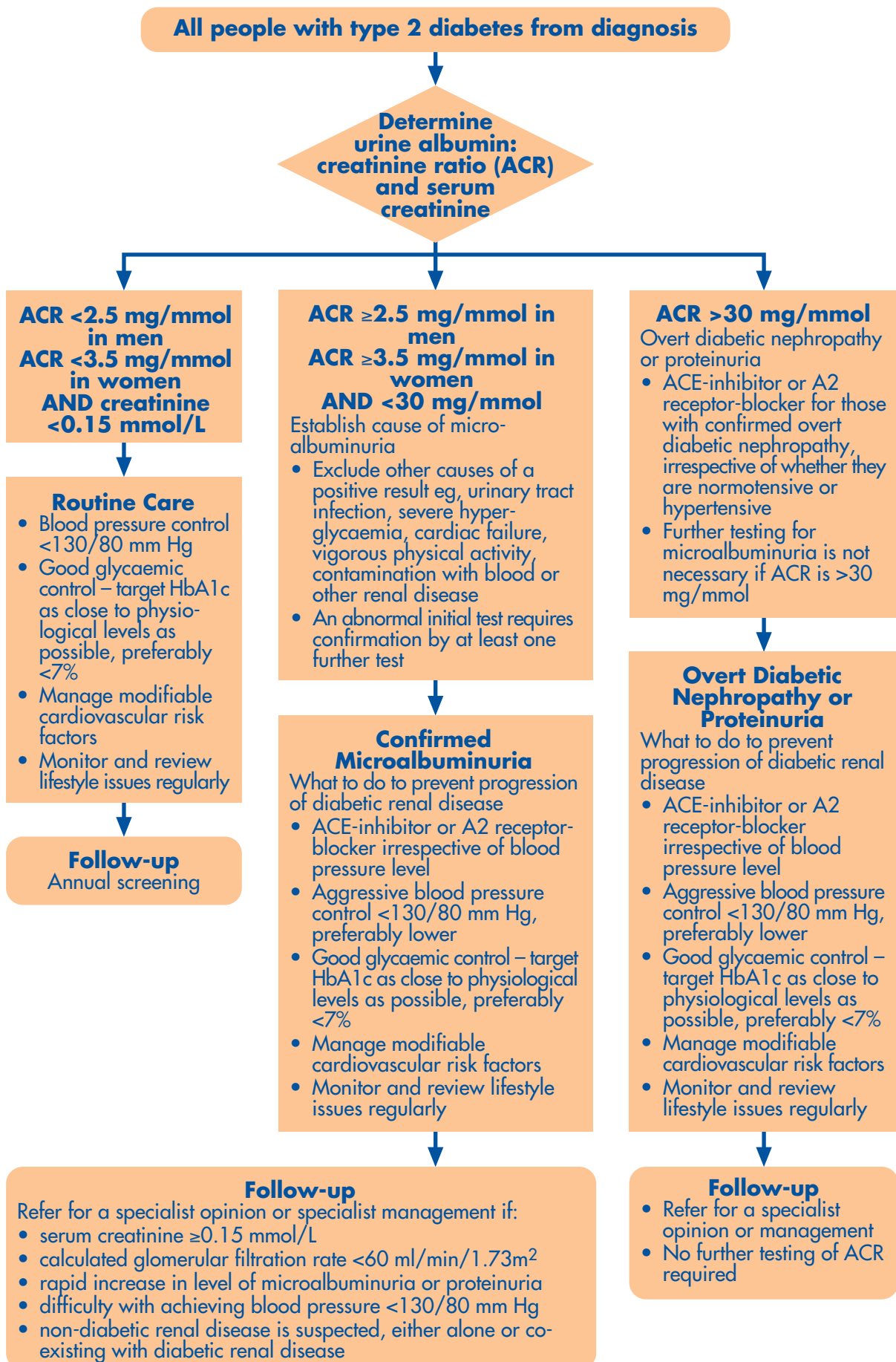
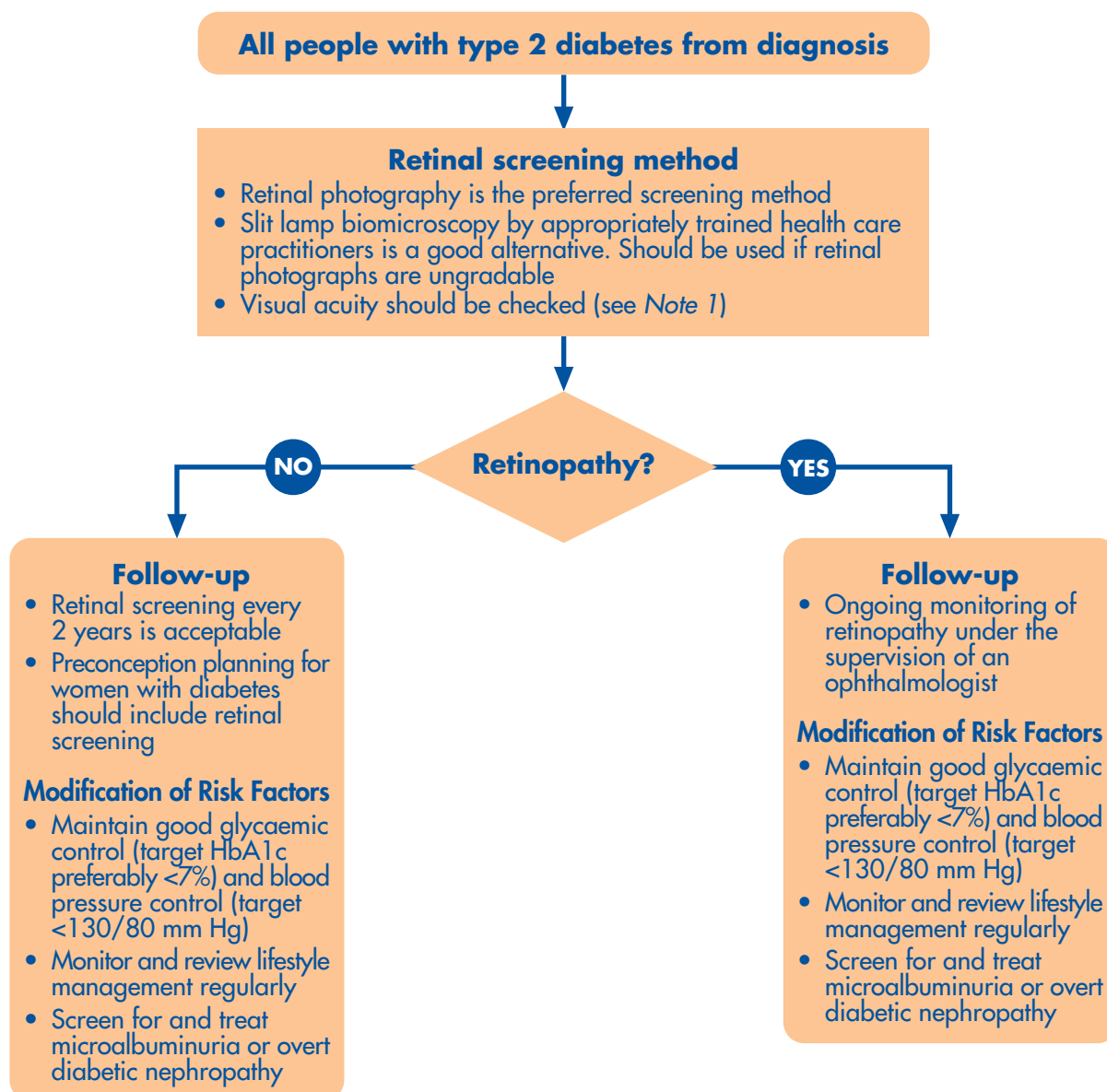


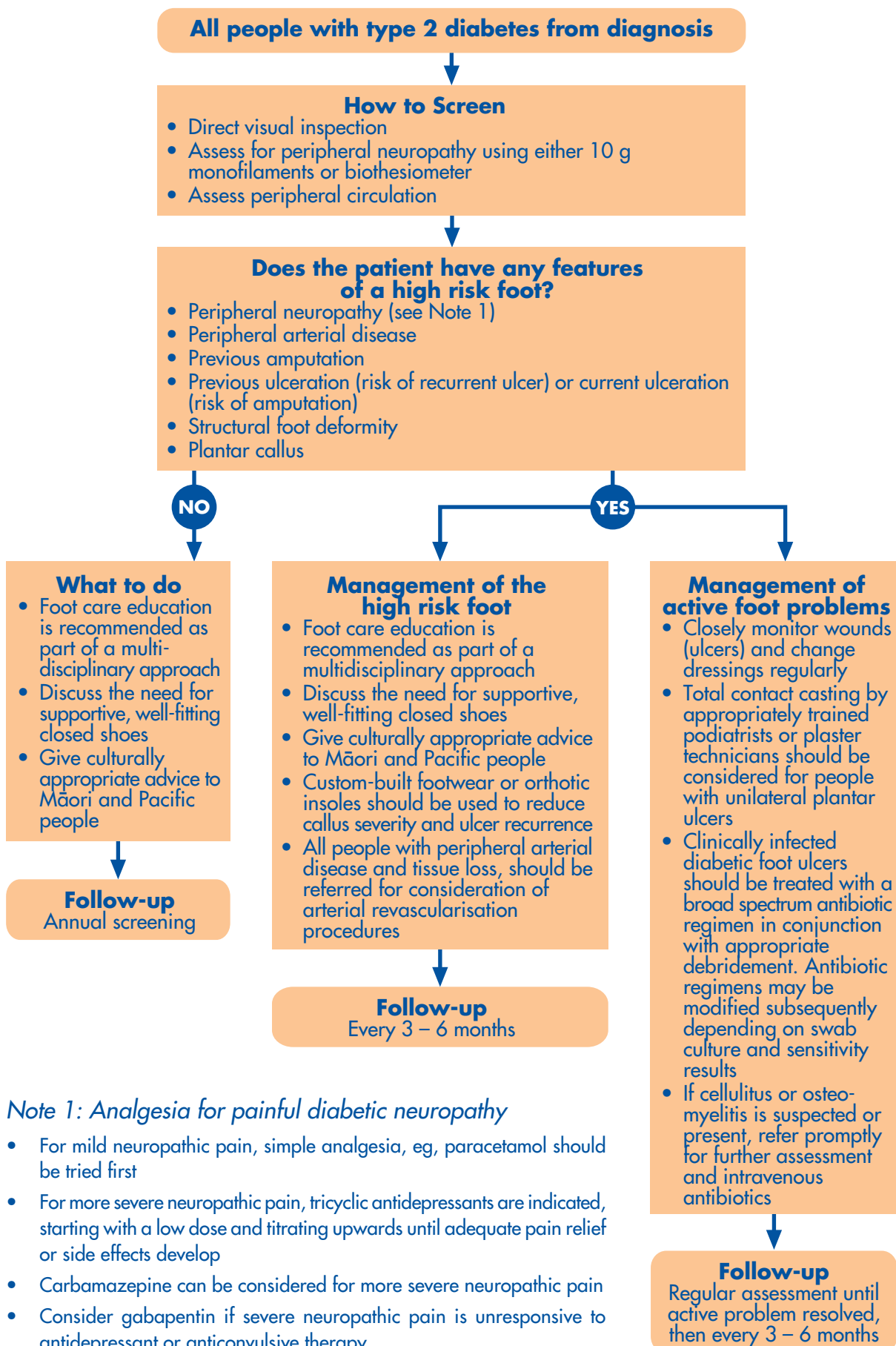
Figure 4: Identifying and preventing visual impairment and blindness



Note 1

People with symptomatic visual loss are not candidates for retinal screening. Assessment and regular review by an ophthalmologist is required.

Figure 5: Preventing active foot problems and lower limb amputation



Note 1: Analgesia for painful diabetic neuropathy

- For mild neuropathic pain, simple analgesia, eg, paracetamol should be tried first
- For more severe neuropathic pain, tricyclic antidepressants are indicated, starting with a low dose and titrating upwards until adequate pain relief or side effects develop
- Carbamazepine can be considered for more severe neuropathic pain
- Consider gabapentin if severe neuropathic pain is unresponsive to antidepressant or anticonvulsive therapy
- Topical capsaicin should be considered for the relief of localised neuropathic pain.