Australian Government
Department of Veterans' Affairs

Veterans'MATES

Therapeutic brief 11

Building a comprehensive care cycle for veterans with diabetes

The risk of cardiovascular (CV) and microvascular (nephropathy, neuropathy, retinopathy) complications of diabetes can be significantly reduced by early, intensive, long-term interventions targeting multiple risk factors.[1,2]

This therapeutic brief focuses specifically upon the testing and management of microalbuminuria and glycaemic control, as well as the value of integrating these elements into a formalised cycle of care. Patients with abnormal glucose metabolism without overt diabetes may also benefit from these interventions.

Analysis of DVA data indicates that many veterans with diabetes could benefit from increased use of these elements of diabetes care, particularly those in residential aged-care.[3]

Overall, only 40% of veterans dispensed medicines for diabetes were tested for microalbuminuria during 2005. The rate of testing was particularly low in residential aged-care (Figure 1).

Veterans' MATES Module 3 ("Diabetes Triple Check") advocated clinical review of cardiovascular drugs and was followed by a 16% increase in lipid lowering and anti-platelet therapy in veterans dispensed medications for diabetes.

Inside

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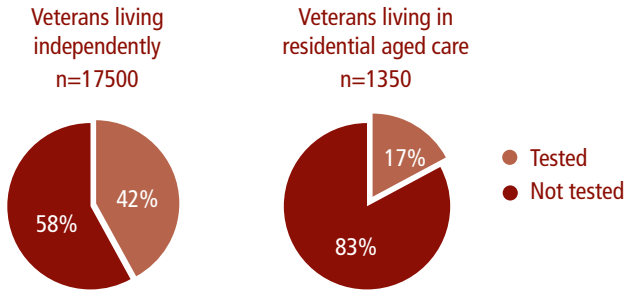
Figure 1. Testing for microalbuminuria in Australian veterans dispensed medications for diabetes (2005).[3]



Key actions

- **Test all patients for microalbuminuria.** This should be done at the time of diagnosis of diabetes and reviewed annually. More frequent testing will be required if albuminuria is established.[4,5,6]
- Treat all patients with diabetes complicated by microalbuminuria or overt nephropathy (macroalbuminuria) with an ACE inhibitor (ACE-I) or angiotensin II receptor blocker (ARB) unless contraindicated, independent of blood pressure (BP) and Glomerular Filtration Rate (GFR).[4,5,6]
- **Test HbA1c in all patients with diabetes at diagnosis and every 6 months.** If HbA1c goals are not being met then test every 3 months.[4,6]
- **Initiate a Diabetes Annual Cycle of Care and integrate a GP Management Plan (GPMP) where appropriate.** The Annual Cycle of Care comprises a number of elements of care, including testing for microalbuminuria and HbA1c, as well as foot and eye examinations.[4]

2 Management of microalbuminuria

Key information

- Microalbuminuria is a marker of early renal impairment and an independent predictor of end-stage renal disease in diabetes.[4,5]
- Microalbuminuria is strongly predictive, independently of other risk factors, of cardiovascular disease and mortality in patients with diabetes.[7]
- Renal function should be regularly monitored using both GFR and urinary albumin excretion. Measuring serum creatinine levels and/or determining GFR does not eliminate the need to test for microalbuminuria.[4,6]

Thirty to 50% of patients with diabetes will develop microalbuminuria.[8,9] Of these a third will progress to proteinuria, a third will remain microalbuminuric, and a third will revert to normal (some due to treatment, which should be continued indefinitely).[8] Once persistent significant proteinuria is present, patients are at high risk of end stage renal disease and ten year survival is poor.[4,5,6,8]

Microalbuminuria is both a marker of early nephropathy and a strong predictor of CV disease.[4,7,10] A reduced GFR in patients with diabetes is also a strong predictor of CV disease,[10] and both GFR and microalbuminuria should be routinely monitored.[4,6]

As an indicator of microvascular disease, a finding of microalbuminuria should prompt review for other microvascular complications, particularly retinopathy.[11]

Testing for microalbuminuria

Screen all patients for microalbuminuria at the time of diagnosis of diabetes. A positive result should be confirmed by a second test. If the second test is normal, a third test should be performed. Two positive results confirm a diagnosis of microalbuminuria,[6,8,11]

then, re-screen 12 monthly if a diagnosis of microalbuminuria has not been established;

or, monitor 3 to 6 monthly if a diagnosis of microalbuminuria has been established.

Testing options for microalbuminuria (MA) include:

- albumin-creatinine ratio (ACR) on a spot morning urine
- timed overnight urine collection, or
- 24-hour urine collection.

Australian guidelines recommend urinary ACR as the initial screen for microalbuminuria.[4,5]

A timed overnight collection may be used to confirm a positive ACR result.[5] RACGP/Diabetes Australia guidelines suggest that a 24-hour timed collection should be used to monitor the progression of macroalbuminuria.[4]

Table 1. Testing for urinary albumin in diabetes

Test*	When to use	Advantages/Disadvantages	Reference range**
Urinary ACR on a spot first voided morning urine	Initial screen[4,5,6]	• Convenient and simple for patients. Spot morning urine is 10 mls (at least) of urine from the first void in the morning • Best test for initial screen	Normal: Women: <3.5 mg/mmol; Men: < 2.5 mg/mmol Microalbuminuria: Women: 3.6-35 mg/mmol; Men: 2.6-25 mg/mmol Macroalbuminuria: Women: >35 mg/mmol; Men: > 25 mg/mmol
Timed overnight urine collection	May be used to confirm microalbuminuria if initial screen with ACR is abnormal[5]	• Procedure may be difficult for patients to follow • Recording errors, and incomplete bladder emptying will bias results[12] • Easier for patients than 24-hour collection and less influenced by confounders	Normal: < 20 µg/min Microalbuminuria: 20-200 µg/min Macroalbuminuria (overt proteinuria): > 200 µg/min
24-hour urine collection	Used to monitor progression of macroalbuminuria[4]	• Very inconvenient for patients • Exercise, posture, and diet, can increase urinary albumin excretion	Normal: < 30 mg/24 hours Microalbuminuria: 30-300 mg/24 hours Macroalbuminuria (overt proteinuria): > 300 mg/24 hours

* Standard urine dipsticks are not sensitive enough to detect microalbuminuria.[5] Micral© test strips are more accurate for detecting microalbuminuria, but they are expensive and performance is operator dependent.[5,12] Any positive result should be confirmed with one of the tests described in Table 1 above.

** Hyperglycaemia, urinary tract infections, haematuria, marked hypertension, heart failure, acute febrile illness, and vigorous exercise can all cause elevations in urinary albumin excretion.[11]

Treatment of microalbuminuria

ACE-Is and Angiotensin Receptor Blockers (ARBs) have both been shown to slow the progression of microalbuminuria and are recommended for use in both normotensive and hypertensive patients with diabetes and albuminuria.[4,6] The cardiovascular and renal benefit of these agents may be dose dependent, so it is important to titrate upwards as close as possible to the recommended dose.[13]

Treatment guidelines recommend:[5]

1. All patients with diabetes and micro- or macro-albuminuria should be treated with an ACE-I (subject to the usual contraindications), independent of BP and GFR. Low BP is not an absolute contraindication.
2. ARBs may be used as an alternative to ACE-Is in the treatment of micro- or macro-albuminuria in diabetes.
3. There is currently insufficient evidence to recommend universal ACE-I or ARB treatment for all diabetic patients with normal BP and normal albumin excretion.
4. It is quite common for serum creatinine to increase after the initiation of an ACE-I. Despite this, continued treatment can lead to long-term preservation of renal function. Monitoring is important, and treatment may need to be ceased if there is a substantial acute increase, or sustained elevation, of the serum creatinine.
5. Although dual blockade with an ACE-I and ARB is not yet established as a first-line treatment for all patients with diabetic nephropathy, it may be helpful in reaching treatment goals for BP and albuminuria in individual patients. Dual blockade increases the risk of hypotension, hyperkalaemia, and increased serum creatinine as compared to monotherapy.

Management of glycaemic control

Key information

- For every percentage point decrease in HbA1c, the risk of microvascular complications is reduced by 37%.[14] The evidence for intensive glycaemic control to reduce cardiovascular complications in diabetes is supported by epidemiological studies.[6]
- Target HbA1c is ≤ 7% and any reduction in HbA1c towards target is likely to improve health outcomes.[4,6]

HbA1c

Target HbA1c is ≤ 7%. More stringent glycaemic goals may further reduce complications, but possibly at an increased risk of hypoglycaemia.[6] Less intensive glycaemic goals may be indicated in patients with severe or frequent hypoglycaemia, the elderly, and patients with limited life expectancy.[6]

Test all patients for HbA1c at the time of diagnosis of diabetes,[4,6]

then, six monthly if glycaemic control is stable and patient is achieving HbA1c goals;

or, three monthly in patients whose therapy has been altered or who are not achieving HbA1c goals.

Because anaemia, chronic renal failure, and variant haemoglobins may affect HbA1c values, note these conditions for the pathology laboratory when requesting an HbA1c measurement.

Diabetes care plans

Key information

- Structured diabetes care plans may help improve processes of care and health outcomes.[15,16]
- Medicare rebates are available for a Diabetes Annual Cycle of Care and/or a GP Management Plan (GPMP).[4]

Diabetes Annual Cycle of Care[4]

A Diabetes Annual Cycle of Care includes a regular 3-monthly patient review and a 12-monthly patient review. Consider a GPMP (see below) as part of this process.

The 3-monthly patient review should include the following:

- Discourage smoking, review symptoms and self-monitoring.
- History: smoking, nutrition, alcohol, physical activity, patient's record of home testing and quality control results and foot symptoms.
- Examination: check weight, height (children and adolescents), BP and feet examination if new symptoms or at risk (eg: neuropathy ± peripheral vascular disease).
- Investigations: review need for HbA1c, lipids and microalbuminuria.

The 12-monthly patient review should include a full system assessment, checking for cardiovascular, peripheral vascular, renal, eye, cognitive, peripheral nerve and foot problems. Influenza, pneumococcal, and tetanus vaccination status should be reviewed.

Table 2. Minimum requirements needed to complete a rebatable Annual Cycle of Care for patients with established diabetes

Check/Test	Frequency
Blood Pressure	Every 6 months
Weight/waist circumference/BMI	Every 6 months
Feet examination	Every 6 months
Glycaemic control (HbA1c)	Once per year
Blood lipids	Once per year
Microalbuminuria	Once per year
Check smoking status and encourage cessation of smoking	Once per year
Reinforce information about appropriate dietary choices	Once per year
Reinforce information about appropriate levels of physical activity	Once per year
Provide self-care education	Once per year
Review of medications	Once per year
Comprehensive eye examination	Every 2 years

More frequent provision of services may be required for patients with complications and other co-morbidities.

GP Management Plan (GPMP)[4,17]

GPMPs are action plans developed by the general practitioner and patient, which incorporate the patient's needs and goals, identify required treatments and services, and specify any other resources required. GPMPs identify the people responsible for achieving treatment goals (e.g. GP, patient, allied health workers). Team Care Arrangements (TCA) are an expansion of the GPMP which allow active input from allied health workers and feedback to the GP and patient. Templates for use are available via medical software, GP Networks/Divisions, and at: http://www.health.gov.au and go to information for health professionals and search for 'GPMP forms'.

What to tell my veteran patient about diabetes

Diabetes can damage blood vessels which can then cause problems for your kidneys, heart, feet and eyes.

Lifestyle choices can help your health, for example: quitting smoking, eating a balanced and nutritious diet, maintaining a healthy body weight, having an adequate fluid intake and regular exercise.

Medicines can prevent or reduce problems by lowering your blood sugar, keeping your kidneys healthy, lowering your cholesterol, lowering your BP, lowering your risk of heart disease, and preventing damage to your eyes and feet.

Stopping smoking is the single most important risk factor to help prevent CV disease (the Quitline is available 24 hours for information and support - Phone 137 848).

For drug information, including precautions, adverse effects, interactions and contraindications, please refer to the Australian Medicines Handbook (AMH) 2007 and approved product information.

A commonly used CV risk calculator is the New Zealand Risk Calculator available at http://www.sld.cu/galerias/pdf/servicios/hta/ebm_cardio_new_zeland.pdf

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