Guideline for Microalbuminuria Screening

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Produced: August 2006

Approved by:
East Lancashire Diabetes Network Clinical Standards Group

August 2006

Guideline reviewed: February 2007
(CKD guidelines updated October 2007)

Approved for use in:
East Lancashire Primary Care Trust
Blackburn with Darwen Primary Care Trust
East Lancashire Hospitals NHS Trust
Microalbuminuria Screening Identification Guidelines

To identify patients who would benefit from microalbuminuria testing

Diabetic Patients aged 12 and over

Is the patient already diagnosed with Proteinuria or Microalbuminuria?

| Should be coded: | C10EK | Type 1 diabetes with persistent proteinuria |
| C10EL | persistent microalbuminuria |
| C10FL | Type 2 diabetes with persistent proteinuria |
| C10FM | persistent microalbuminuria |

(See your PRIMIS facilitator for help with validating this register)

No

Are they being prescribed an ACE or AT II?*

No

Microalbuminuria TEST (follow algorithm)

Yes

No TEST but need to ensure they are being prescribed ACE or ATII*

No

Microalbuminuria TEST

Yes

Microalbuminuria TEST

NB: ALL patients should continue to have annual Protein dipstick

* One of the following codes should be added if ACE cannot be prescribed:-

<table>
<thead>
<tr>
<th>ACE Inhibitor</th>
<th>Angiotensin II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindicated</td>
<td>8128</td>
</tr>
<tr>
<td>Declined</td>
<td>813D</td>
</tr>
<tr>
<td>Not indicated</td>
<td>8164</td>
</tr>
<tr>
<td>Not tolerated</td>
<td>8174</td>
</tr>
</tbody>
</table>
All patients with diabetes over 12 years should have their urine tested annually with a dipstick to identify level of protein.

Dipstick (ideally 1st morning mid-stream specimen) urine for protein - exclude the visual presence of blood.

If Positive

Consider & treat infection and confirm persistent proteinuria on 2 further clear catch samples.

If proteinuria confirmed, send urine sample to lab for protein/creatinine ratio refer to renal management pathway (attached) for diabetic nephropathy.

If Negative

Keep sample cool and send the sample promptly to path. lab for microalbumin/creatinine ratio, in white topped bottle.

If Positive

[male >2.5 mg/mmol]
[female >3.5 mg/mmol]

If Negative

No further action and repeat in 1 year.

Send up to 2 further early morning clear catch specimens of urine within the next month.

2 out of 3 positive samples confirm microalbuminuria and refer to renal management pathway (see referral criteria attached).

NB - If retinopathy is not present and proteinuria/microalbuminuria confirmed, consider a non diabetic cause of renal disease and investigate as appropriate.

Ideally, all people with diabetes should be screened as per national guidelines. The local Diabetes Network is working towards meeting the requirements of the national guidelines.
1) This is a guide to the management and referral of adult patients with chronic kidney disease. Reduction of Kidney Function is common, particularly in the elderly and most patients can be treated in primary care. Acute Renal Failure warrants urgent referral.

2) Cardiovascular complications are the main cause of mortality and morbidity. This is much more common than end-stage renal failure. Reduction of cardiovascular risk is the most important aspect of treatment.

3) Estimated GFR (eGFR) should be calculated from blood using the abbreviated MDRD formulae. Local laboratories will provide this on patients with a significant elevation of plasma creatinine or on request. There is no need for 24 hour urine collections.

4) Reduced kidney function is defined as GFR <60ml/min or 60-90 ml/min in patients with other evidence of kidney disease. A system for staging is provided.

5) GFR > 60 ml/min is considered normal unless there is a second reason to suspect renal disease.

6) Some loss of kidney function is common with ageing. On average GFR falls by 1 ml/min each year after age 40. Referral should take into account age and co-morbidity.

7) Proteinuria indicates kidney disease. This can be estimated from protein-creatinine ratio measured in a single random urine sample (preferably early morning).

8) Macroscopic and microscopic haematuria may indicate intrinsic kidney disease. Refer all patients with macroscopic haematuria and those over age 50 with microscopic haematuria to Urology under 2 week rule. Check renal function in all patients and refer to Nephrology if this is abnormal or there is proteinuria.

9) The use of ACE inhibitors and ARBs often causes concern. The benefits outweigh risks in most patients (see notes) and are dose-related. Use the highest tolerated dose. Reserve ARBs for patients who get side-effects from ACE Inhibitors.
Is the patient acutely unwell?

Yes

Manage illness as appropriate. Repeat GFR within 1-7 days

No

Symptoms of outflow obstruction?
Poor Flow, Frequency, Nocturia, Elderly Men

Yes

Palpate for bladder
Consider renal tract ultrasound

No

Has a reduced GFR/raised creatinine been measured previously?

Yes

GFR > 60ml/min and other evidence of kidney damage

Renal ultrasound scan if history suggestive of urological disease

GFR <60ml/min

No

Repeat GFR

GFR <30 ml/min

Refer or, if not for active treatment, discuss with Nephrologist (based on co-morbidity/extra-renal disease). Shared Care.

- Give smoking and weight advice
- Treat BP with target <130/80 (<125/75 if proteinuria). Use ACE Inhibitor (ARB if side-effects) if proteinuria, micro-albuminuria or heart failure. Consider recommending that patients buys own meter. This must be validated by British Hypertension Society
- Treat hyperlipidaemia
- Aspirin if 10 year CV risk > 15%
- Avoid NSAID
- Influenza/Pneumococcal vaccination if GFR < 60 ml/min
- If urine protein > + and negative for nitrites or leucocytes, send a random urine for protein/creatinine ratio. Refer to renal team if PCR > 100 mg/mmol or if PCR > 50 mg/mmol and dipstick is > + for blood.
- Recheck eGFR at 6 – 12 months. If rate of decline > 4ml/min per year, refer to or discuss with nephrologist

NB: Blood pressure control is very important. This may take a very long time unless patients are seen frequently until the best possible control has been achieved.
**Testing urine for protein**

By dipstick (NB there is no need for 24hr urine collection at any stage)

There is no evidence that asymptomatic urine infection causes proteinuria

*If positive (1+ or more):*
  
  a) send a urine sample to Clinical Chemistry for protein/creatinine ratio (PCR). If PCR > 30mg/mmol, repeat on early morning urine (first sample on getting up; because protein may be absent after recumbency)
  
  b) test for blood using dipstick
  
  c) estimate GFR from serum creatinine

**N.B.** Patients with diabetes mellitus should have annual testing for microalbuminuria (urine albumin/creatinine ratio, ACR) only if dipstick protein negative. ACR is a more sensitive and expensive test and not necessary for patients who are not diabetic or diabetic patients who are already taking an ACE Inhibitor or ARB (see diabetes guideline), for whom testing with a standard stick is adequate.

**Testing urine for blood**

By dipstick (NB there is no need for urine microscopy)

*If positive (1+ or more)*
  
  a) exclude infection, menstruation, trauma
  
  b) test for urine protein (see above)
  
  c) estimate GFR (as above)

Microscopic haematuria is common. Progressive renal disease is rare in the absence of proteinuria, other evidence of kidney disease or +++ of blood. Isolated microscopic haematuria (+ or ++) can be monitored in primary care after excluding urological disease. Urology guidelines require MSSU, renal ultrasound and plain abdominal x-ray at all ages and flexible cystoscopy for those over age 50.

**Staging of Kidney Disease**

<table>
<thead>
<tr>
<th>Stage</th>
<th>GFR ml/min</th>
<th>Minimum testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>Normal GFR*</td>
<td>&gt;90 annually</td>
</tr>
<tr>
<td>2*</td>
<td>Slight impairment*</td>
<td>60-89 annually</td>
</tr>
<tr>
<td>3A</td>
<td>Mild impairment</td>
<td>45-59 annually</td>
</tr>
<tr>
<td>3B</td>
<td>Moderate impairment</td>
<td>30-44 6-monthly</td>
</tr>
<tr>
<td>4</td>
<td>Severe impairment</td>
<td>15-29 3-monthly</td>
</tr>
<tr>
<td>5</td>
<td>Established renal failure</td>
<td>&lt;15 3-monthly</td>
</tr>
</tbody>
</table>

*The terms stages 1 and 2 apply only when there is a structural abnormality such as polycystic kidney disease or a functional abnormality such as persistent proteinuria. Otherwise a GFR of 60-89 is considered normal.

The suffix p may be added when there is proteinuria (PCR >100 mg/mmol), i.e. 2p means stage 2 with proteinuria
MONITORING OF CHRONIC KIDNEY DISEASE

Estimated GFR 30-60 ml/min or other evidence of kidney disease (Stage 1-3 CKD)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Stages 1, 2 and 3A</th>
<th>Stage 3B and all Patients with Proteinuria (PCR &gt;100 mg/mmol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine and potassium</td>
<td>Every 12 months</td>
<td>Every six months</td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>If clinically indicated</td>
<td>Every six months</td>
</tr>
<tr>
<td>Dipstick Test for Proteinuria (or Urine PCR if positive ++ or more)</td>
<td></td>
<td>Every 12 months</td>
</tr>
</tbody>
</table>

- Meticulous control of blood pressure. The threshold for initiation of treatment is 140/90 or 130/80 for those with urine PCR > 100 mg/mmol; target BP 130/80 if PCR < 100 or 125/75 for those with urine PCR > 100 mg/mmol.
- See hypertension guideline for advice on treatment of blood pressure.
- Anaemia should be investigated to exclude iron deficiency and other common causes. After these have been excluded refer to renal physician if Hb <10.5 g/dL.
- Abnormal corrected calcium or phosphate concentrations are indications for referral.

Estimated GFR < 30 ml/min (Stages 4 and 5 CKD)

Patients with stage 4 or 5 CKD should be referred to a nephrologist (see Referral Information). Exceptions include patients with a terminal illness, those who have already been investigated and for whom further investigation and management is inappropriate.

<table>
<thead>
<tr>
<th>Parameter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine, potassium &amp; bicarbonate</td>
<td>Every 3 months</td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>Every 3 months</td>
</tr>
<tr>
<td>Calcium</td>
<td>Every 6 months</td>
</tr>
</tbody>
</table>

Monitoring kidney function when prescribing ACEI or ARB

ACE Inhibitors and ARBs are indicated for patients with proteinuria, diabetic microalbuminuria, left ventricular dysfunction and other evidence of vascular disease. They may be used in patients with reduced kidney function. Benefits have been demonstrated up to a creatinine of 500 micromole/l.

Serum creatinine and potassium concentrations should be checked prior to starting ACEI and/or ARBs, within 2 weeks of starting or increasing dose; and at annual intervals thereafter, or more frequently if indicated, according to kidney function.

A rise of serum creatinine concentration of > 30 % or fall in estimated GFR of > 25% after initiation or dose increase should prompt referral to a nephrologist.

If serum K+ > 6.0 mmol/l, repeat blood sample, to exclude haemolysis. If confirmed check diet (to exclude LoSalt), stop concomitant nephrotoxic drugs (e.g. NSAIDs), reduce or stop potassium-retaining diuretics (amiloride, triamterene, spironolactone).

Metformin

Metformin is excreted by the kidneys and may accumulate in renal failure. It is contraindicated in advanced renal failure, although the risk is small. Consider alternative treatment when eGFR < 30 ml/min.
REFERRAL

Urgent

- Rapidly deteriorating kidney function/suspected acute renal failure.
- Newly detected GFR < 15 mL/min with symptoms (Stage 5 CKD).
- Accelerated or malignant phase hypertension.
- Severe hyperkalaemia (serum potassium > 7 mmol/L)
- Nephrotic syndrome
- Multisystem disease (e.g. SLE) with evidence of kidney disease (i.e. abnormal GFR, proteinuria or haematuria).

Routine

- Newly detected GFR < 30 ml/min (Stage 4 and 5 CKD) after consideration of age and co-morbidity.
- Proteinuria with urine protein:creatinine ratio (PCR) > 100 mg/mmol (irrespective of GFR)
- Rise in serum creatinine > 15% or fall in GFR > 4 ml/min over 12 months after confirmation with a second blood test.
- Acute deterioration in kidney function associated with use of ACEIs or ARBs (defined as a fall of GFR of >25% or 30% rise in serum creatinine concentration from pre-treatment level or level prior to latest increase in dosage).
- Haematuria + proteinuria (> 50 mg/mmol) (irrespective of GFR)
- Urologically unexplained macroscopic haematuria. (Macroscopic haematuria should be referred under 2 week rule to Urology for cystoscopy)
- Refractory hypertension (inadequate BP control, defined as BP > 150/90 mm Hg despite 4 drug combination therapy) plus suspicion of underlying kidney disease
- Anaemia (Hb <10.5g/dL) after exclusion of other causes of anaemia.
- Hyperkalaemia (serum potassium > 6.0 mmol/L on more than one sample) after exclusion of artefactual and treatable causes.
- Abnormal calcium or phosphate concentrations in patients with kidney disease.

Referral Information

- Main kidney problem & how discovered
- Past medical and drug history
- Social circumstances
- Current and past Blood Pressure measurements and treatment
- Relevant physical examination e.g palpable bladder.
- List of dates and results of serum creatinine to assess stability
- Dipstick results and protein-creatinine ratio if positive
- Result of renal ultrasound scan.

Further Advice

http://www.renal.org/CKDguide/ckd.html

A secure email helpline from the Preston Renal Unit will be available soon.