## Screening and Monitoring

### Urinalysis for protein

**Less than 1+ protein:** Test for microalbuminuria with either:
1. Spot AM urine for mg microalbumin/mg creatinine (ratio);
2. Timed urine collection for mcg albumin/min; or
3. 24 hour urine collection for total mg albumin/24 hours.

**NOTE:** See the following two boxes for interpretation of results for these tests.

<table>
<thead>
<tr>
<th>Urinalysis for protein</th>
<th>Treatment and Monitoring</th>
<th>Risk of ESRD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Less than 1+ protein:</strong></td>
<td><strong>Protective Recommendations for all patients</strong></td>
<td>Low</td>
</tr>
<tr>
<td>1. Spot AM urine microalbumin/creatinine ratio less than 0.03 mg/mg on 2 of 3 tests (to rule out false positives);</td>
<td>1. Strict glucose control (HbA1C less than or equal to 7.0% using an NGSP-certified method);</td>
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</tr>
<tr>
<td>2. Urine albumin less than 20 mcg/min on timed urine collection; or</td>
<td>2. Strict blood pressure control (less than or equal to 130/80);</td>
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<tr>
<td>3. Total urine albumin less than 30 mg on 24-hour urine collection.</td>
<td>3. Strict lipid control (cholesterol less than 200 mg/dL, LDL less than 100 mg/dL, HDL greater than 45 mg/dL, triglycerides less than 150 mg/dL).</td>
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</tr>
</tbody>
</table>

### Microalbuminuria (incipient nephropathy)

1. If serum creatinine less than 2 mg/dL and K+ less than 5.5 mEq/L, treat with ACE inhibitor or ARBs;
2. Continue **Protective Recommendations** as above;
3. Check serum creatinine and K+ for gross proteinuria annually;
4. If creatinine greater than 2 mg/dL or K+ greater than 5.5 mEq/L; consider consult with nephrologist.

### Macroalbuminuria/gross proteinuria (overt nephropathy)

1. Continue treatment as for microalbuminuria above;
2. Consider consult with nephrologist.

### Marked proteinuria (severe renal disease)

Refer to nephrologist for education and preparation for dialysis

### Greater than or equal to 1+ protein, or

**Spot AM urine albumin/creatinine ratio greater than 0.30 mg/mg on 2 of 3 tests (to rule out false positives).**

Check total gm urine protein on 24-hour urine collection, or spot AM urine protein/creatinine ratio

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<th>Less than 1+ protein</th>
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<tbody>
<tr>
<td><strong>Greater than or equal to 1+ protein, or</strong></td>
<td><strong>Macroalbuminuria/gross proteinuria (overt nephropathy)</strong></td>
<td>High: overt nephropathy</td>
</tr>
<tr>
<td>1. Total urine protein greater than 1 gram in 24 hours; or</td>
<td>1. Continue treatment as for microalbuminuria above;</td>
<td></td>
</tr>
<tr>
<td>2. Spot AM urine protein/creatinine ratio greater than 1.0.</td>
<td>2. Consider consult with nephrologist.</td>
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</tr>
</tbody>
</table>

### Marked proteinuria (severe renal disease)

Refer to nephrologist for education and preparation for dialysis

Extremely high: pending ESRD

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1. UA protein or spot AM urine microalbumin/creatinine ratio may be positive or elevated in the setting of poor glucose control, UTI, heavy exercise, fever or sepsis – treat as appropriate before re-testing.
2. Most labs use a very sensitive method to measure albumin in the microalbumin range. Check with your lab on test choice and availability, specimen collection, preference, and interpretation.
3. NGSP: National Glycohemoglobin Standardization Program
4. ARBs: Angiotensin Receptor Blockers

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