Managing Patients with CKD in Primary Care: A Shared Care Pathway

5th April 2018
Learning Objectives

1) What health risks does CKD represent?

2) Why change how we manage CKD in NWL?

1) How do we improve CKD management in NWL?

## Nice Guidance Classification

<table>
<thead>
<tr>
<th>GFR categories (mL/min/1.73 m²), description and range</th>
<th>ACR categories (mg/mmol), description and range</th>
<th>Increasing risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>GFR and ACR categories and risk of adverse outcomes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| ≥90
Normal and high                                       | <3 Normal to mildly increased                 |                |
| 60–89
Mild reduction related to normal range for a young adult | 3–30 Moderately increased                     |                |
| 45–59
Mild–moderate reduction                                | >30 Severely increased                        |                |
| 30–44
Moderate–severe reduction                              |                                               |                |
| 15–29
Severe reduction                                       |                                               |                |
| <15
Kidney failure                                         |                                               |                |

Chronic kidney disease

### Acute Kidney Injury

<table>
<thead>
<tr>
<th>eGFR</th>
<th>ACR &lt;10</th>
<th>ACR 10-29</th>
<th>ACR 30-299</th>
<th>ACR ≥300</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 105</td>
<td>Ref</td>
<td>Ref</td>
<td>2.7</td>
<td>8.4</td>
</tr>
<tr>
<td>90-105</td>
<td>Ref</td>
<td>Ref</td>
<td>2.4</td>
<td>5.8</td>
</tr>
<tr>
<td>75-90</td>
<td>Ref</td>
<td>Ref</td>
<td>2.5</td>
<td>4.1</td>
</tr>
<tr>
<td>60-75</td>
<td>Ref</td>
<td>Ref</td>
<td>3.3</td>
<td>6.4</td>
</tr>
<tr>
<td>45-60</td>
<td>2.2</td>
<td>4.9</td>
<td>6.4</td>
<td>5.9</td>
</tr>
<tr>
<td>30-45</td>
<td>7.3</td>
<td>10</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>15-30</td>
<td>17</td>
<td>17</td>
<td>21</td>
<td>29</td>
</tr>
</tbody>
</table>

### Kidney failure (ESRD)

<table>
<thead>
<tr>
<th>eGFR</th>
<th>ACR &lt;10</th>
<th>ACR 10-29</th>
<th>ACR 30-299</th>
<th>ACR ≥300</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 105</td>
<td>Ref</td>
<td>Ref</td>
<td>7.8</td>
<td>18</td>
</tr>
<tr>
<td>90-105</td>
<td>Ref</td>
<td>Ref</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>75-90</td>
<td>Ref</td>
<td>Ref</td>
<td>3.8</td>
<td>48</td>
</tr>
<tr>
<td>60-75</td>
<td>Ref</td>
<td>Ref</td>
<td>7.4</td>
<td>67</td>
</tr>
<tr>
<td>45-60</td>
<td>5.2</td>
<td>22</td>
<td>40</td>
<td>147</td>
</tr>
<tr>
<td>30-45</td>
<td>56</td>
<td>74</td>
<td>294</td>
<td>763</td>
</tr>
<tr>
<td>15-30</td>
<td>433</td>
<td>1044</td>
<td>1056</td>
<td>2286</td>
</tr>
</tbody>
</table>

### Cardiovascular mortality

<table>
<thead>
<tr>
<th>eGFR</th>
<th>ACR &lt;10</th>
<th>ACR 10-29</th>
<th>ACR 30-299</th>
<th>ACR ≥300</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 105</td>
<td>0.9</td>
<td>1.3</td>
<td>2.3</td>
<td>2.1</td>
</tr>
<tr>
<td>90-105</td>
<td>Ref</td>
<td>1.5</td>
<td>1.7</td>
<td>3.7</td>
</tr>
<tr>
<td>75-90</td>
<td>1.0</td>
<td>1.3</td>
<td>1.6</td>
<td>3.7</td>
</tr>
<tr>
<td>60-75</td>
<td>1.1</td>
<td>1.4</td>
<td>2.0</td>
<td>4.1</td>
</tr>
<tr>
<td>45-60</td>
<td>1.5</td>
<td>2.2</td>
<td>2.8</td>
<td>4.3</td>
</tr>
<tr>
<td>30-45</td>
<td>2.2</td>
<td>2.7</td>
<td>3.4</td>
<td>5.2</td>
</tr>
<tr>
<td>15-30</td>
<td>14</td>
<td>7.9</td>
<td>4.8</td>
<td>8.1</td>
</tr>
</tbody>
</table>
Increased cardiovascular mortality in renal disease

USRDS data; Levey et al, AJKD, 1998
Incidence of end-stage renal disease

UK = 120 per million population (pmp)

Renal Registry, 2016 Report
Observations

- Cardiovascular disease remains associated with CKD with increased mortality.

- Estimated annual cost of managing an individual’s:
  - CKD = £235
  - Transplant = £12,000
  - Dialysis = £27,000

- Significant number of patients have non-progressive CKD who do not require specialist input.

West Midlands Experience

Rayner et al, NDT 2013
CKD pathway redesign in NWL

Aims:
1. Reduce incident ESRD growth
2. Stabilise prevalent ESRD cohort in NWL
3. Reduce unnecessary clinic attendance
4. Increase discharges from secondary care
5. Improve care & experience of CKD in NWL
6. Support self management and community care

Identify and focus upon those at risk
Ensure that patients are treated according to NICE guidance to reduce or prevent progression across the system
Improve the efficiency of care for patients with CKD
Improve the planning for ESRD management for those that deteriorate
Activities

- CKD shared care programme and pathway re-design with virtual clinics
- E-advice service
- Consultant outreach into primary care (CC4A: Connecting Care for Adults with long term conditions)
Current Engagement
Constituents of the pathway

Referral criteria
Transfer from secondary care follow-up
Discharge information
Maintenance in primary care
Quality standards

LOCAL GUIDELINES
Constituents of the pathway

- NICE guidance
- Electronic referral forms
- Supported by e-advice

LOCAL GUIDELINES

- Referral criteria
- Transfer from secondary care follow-up
- Discharge information
- Maintenance in primary care
- Quality standards
CHRONIC KIDNEY DISEASE – REFERRAL ALGORITHM

Endorsed by CWHHE Diabetes Strategy Group

eGFR<60

Is patient unwell?

YES

Manage acute illness
Is this acute kidney injury (AKI)?
Repeat eGFR within 1 week, refer urgently if declining

NO

Urine dipstick

Persistent haematuria (≥1+)?

YES AND > 50 YRS

Urology referral

NO

YES AND < 50 YRS

Is malignancy excluded?

YES

Nephrology advice/referral

NO

ACR >70?

YES

Nephrology advice/referral if declining

• Sustained decrease in GFR of ≥ 25% within 12 months
• Sustained decrease in GFR of ≥ 15ml/min within 12 months

NO

Repeat eGFR stable?

YES

STAGE G3a and G3b

Most patients with CKD 4/5 should be being followed in secondary care HOWEVER – if RRT not indicated (eg. frail elderly), management of advanced CKD may be appropriate in primary care

STAGE G4 - 5

Monitor according to page 3

STAGE G5

Most patients with CKD 4/5 should be being followed in secondary care HOWEVER – if RRT not indicated (eg. frail elderly), management of advanced CKD may be appropriate in primary care

What is cause for CKD?
Seek nephrology guidance if this is uncertain

Urgent Referral

• Suspected multisystem disease with evidence of renal involvement
• Acute kidney injury (without an obvious cause manageable in primary care)
• Newly diagnosed eGFR < 15
• Nephrotic syndrome
• Accelerated hypertension
• Severe hyperkalaemia (>6.5mmol/L)

Minimum information for referral

• Dates and results of previous creatinine/eGFR measurement
• Medical history
• Drug history
• Current BP
• Urine dipstick and ACR if dipstick positive

Renal Ultrasound if:
• accelerated progression of CKD
• visible or persistent invisible haematuria
• symptoms of urinary tract obstruction
• family history of polycystic kidney disease and are aged over 20 years
• eGFR of <30 ml/min/1.73 m2 (GFR category G4 or G5)

Email advice from nephrology consultants is available to North West London primary care services:

• ICHC-tr.ckdadvice@nhs.net

Constituents of the pathway

- Unlikely to require specialised renal intervention

- LOCAL GUIDELINES
  - Referral criteria
  - Quality standards
  - Transfer from secondary care follow-up
  - Maintenance in primary care
  - Discharge information

Respect our patients and colleagues | Encourage innovation in all that we do | Provide the highest quality care | Work together for the achievement of outstanding results | Take pride in our success
Constituents of the pathway

LOCAL GUIDELINES

- Referral criteria
- Transfer from secondary care follow-up
- Maintenance in primary care
- Discharge information
- General practitioner
- Patient

Respect our patients and colleagues | Encourage innovation in all that we do | Provide the highest quality care | Work together for the achievement of outstanding results | Take pride in our success
Discharge Pack

**GPs receive a discharge letter informing them**
Patient suitable for community management
Guidance for monitoring and frequency
Criteria for re-referral
Copy of patient information sheet and letter
Notification that the patient will be entered onto the quality audit database

**Patients receive**
Discharge letter
Information sheet with advice on management of cardiovascular risk
Contact information and useful website flyer
Notification that they will be entered onto the quality audit database
Constituents of the pathway

LOCAL GUIDELINES

- Referral criteria
- Transfer from secondary care follow-up
- Discharge information
- Quality standards

- Maintenance in primary care

- Lifestyle
- Vein preservation
- BP <140/90
- RAAS blockade
- Monitor eGFR

Respect our patients and colleagues | Encourage innovation in all that we do | Provide the highest quality care | Work together for the achievement of outstanding results | Take pride in our success
**MANAGEMENT OF STABLE CKD**

Agree management plan with patient

**Lifestyle advice (Exercise/Weight/Meditation)**

Smoking cessation advice

**BP:**
- Encourage home BP monitoring
- Target BP: <140/90 if ACR ≤ 70
  - <130/80 if ACR > 70
- Caution of BP targets in frailty (See page X)
- Prioritise ACEi/ARB with associated sick day guidance

**Cardiovascular risk:**
- Aspirin – if CV risk at 10yrs >20%
- **Proton-pump inhibitors (PPIs)** – esp. if higher risk of gastric irritation with aspirin. Observational data suggest PPIs may cause insidious inflammatory kidney injury – switch to ranitidine if eGFR falling
- Statins – treat according to national guidelines

Avoid NSAIDs

Vaccinate for influenza and pneumococcus

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**RENAL ANAEMIA**

Patients with progressive CKD can develop renal anaemia which usually manifests from CKD3b and beyond. This may require treatment with erythropoietin. Renal anaemia should only be diagnosed after exclusion of other causes including iron deficiency, folate or B12 deficiency, haemolysis. Renal anaemia is unusual prior to CKD3b but if suspected, nephrology advice should be sought.
Sick Day Rules

When unwell:
- Vomiting / diarrhoea
- Unable to eat / drink
- Fevers

Miss out for 2-3 days:
- ACE-inhibitors (ACEis)
- Angiotensin-receptor blockers (ARBs)
- Direct renin inhibitors (eg. Aliskerin)
- Sodium-glucose cotransporter-2 inhibitors (SGLT2)
- Diuretics
- Non-steroidal anti-inflammatory drugs
- Metformin
- Sulphonylureas (eg. gliclazide)
- Short-acting insulin

After 2-3 days:
- Feeling better = resume medications
- No better = seek medical attention
**Proton-pump inhibitors (PPIs)**

- Should be considered if there is a higher risk of gastric irritation with aspirin or when the patient has more advanced CKD (eGFR <20)
- Observational data suggest PPIs may cause insidious inflammatory kidney injury – therefore switch to ranitidine if eGFR falling whilst on PPIs

<table>
<thead>
<tr>
<th>ANTIBIOTIC</th>
<th>Issue in reduced kidney function</th>
<th>Recommendation for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trimethoprim</td>
<td>Raises serum potassium and creatinine ~20% (affects tubular function but not nephrotoxic per se)</td>
<td>Safe for use if eGFR&gt;30 but may transiently elevate K and creatinine – repeat bloods 1-2 weeks later to ensure resolution</td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>Requires filtration and tubular secretion. Reduced excretion in CKD and high levels cause peripheral neuritis</td>
<td>Do not use if eGFR&lt;45. May cause toxicity and not reach high enough urinary concentrations to be effective</td>
</tr>
<tr>
<td>Penicillin</td>
<td>Risk of crystalluria</td>
<td>Generally safe but avoid maximum doses if eGFR&lt;15</td>
</tr>
<tr>
<td>Macrolides (eg. Clarithromycin)</td>
<td>Renally excreted, can cause neurotoxicity</td>
<td>Reduce dose by 50% when eGFR&lt;30</td>
</tr>
<tr>
<td>Quinolones (eg. Ciprofloxacin)</td>
<td>Renally excreted, risk of tendonopathy and potentially nephrotoxic</td>
<td>Reduce dose by 50% when eGFR &lt;15</td>
</tr>
<tr>
<td>Tetracyclines</td>
<td>Partly renally cleared; doxycycline safer</td>
<td>Reduce dose when eGFR&lt;45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HYPOGLYCAEMIC AGENT</th>
<th>eGFR = 45-59 (CKD stage 3a)</th>
<th>eGFR = 30-44 (CKD stage 3b)</th>
<th>eGFR &lt;30 (CKD stage 4-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metformin</td>
<td>Safe to use</td>
<td>Reduce dose</td>
<td>Stop</td>
</tr>
<tr>
<td>Gliclazide</td>
<td>Safe to use</td>
<td>Safe to use</td>
<td>Use with caution; reduce dose</td>
</tr>
<tr>
<td>DPP-4 inhibitors (eg. Linagliptin, Sitagliptin)</td>
<td>Safe to use</td>
<td>Adjust dose according to licence (only Linagliptin unchanged = 5mg OD)</td>
<td>Adjust dose according to licence (only Linagliptin unchanged = 5mg OD)</td>
</tr>
<tr>
<td>SGLT-2 inhibitors (eg. Canagliflozin, Empagliflozin)</td>
<td>Reduce dose (Cana- and Empa-glipfloxin) Stop Dapagliflozin</td>
<td></td>
<td>Stop</td>
</tr>
<tr>
<td>GLP-1 inhibitors (eg. Liraglutide, Exanatide)</td>
<td>Adjust dose according to licence</td>
<td>Adjust dose according to licence</td>
<td>Stop if eGFR&lt;15 (Liraglutide, Dulaglutide safe if eGFR&gt;15)</td>
</tr>
<tr>
<td>Pioglitazone</td>
<td>Safe to use</td>
<td>Safe to use</td>
<td>Safe to use</td>
</tr>
</tbody>
</table>
Constituents of the pathway

- BP target achieved
- eGFR measured within 12 mths
- Change in eGFR managed
1 year follow-up data

- Using Whole Systems Integrated Care (WSIC) platform
- Available data for 66% of patients

- Of those:
- 74% within 1yr (+/- 3 mths)
- 92% within 1yr (+/- 6 mths)

<table>
<thead>
<tr>
<th>Medians (range)</th>
<th>2015 (transfer)</th>
<th>2016 (1yr follow-up)</th>
</tr>
</thead>
<tbody>
<tr>
<td>systBP</td>
<td>131 (107-196)</td>
<td>132 (95-168)</td>
</tr>
<tr>
<td>diastBP</td>
<td>76 (52-103)</td>
<td>77 (50-107)</td>
</tr>
<tr>
<td>sCreatinine</td>
<td>135 (69-243)</td>
<td>131 (71-279)</td>
</tr>
<tr>
<td>eGFR</td>
<td>42 (25-&gt;90)</td>
<td>42 (14-71)</td>
</tr>
</tbody>
</table>
Change in eGFR at 1 year
(median = 0 mL/min/1.73m²)

17 individuals >5mL/min/m² eGFR fall in 1 yr (26% of 66 total)
LOCAL GUIDELINES

- Education sessions in community
- Educational literature
- PATIENT education

Supported by:
ICHCTr.ckdadvice@nhs.net
CURRENT STATUS

• >30 community education CKD sessions delivered
• >700 patients transferred from renal OPD into shared care
• E-advice service feedback and clinic attendance avoidance
• Re-organisation of HH and CXH Nephrology services – freeing up capacity to increase service available for patients with stage 4 CKD / near ESRF as well as supporting patients to continue care out of hospital
Imperial CKD email advice service

• Explicitly for questions on CKD
• Guaranteed answer in <24 hours weekdays
• Rotation of 4 consultants
• Unfunded
Imperial CKD email service: data

- Over 10 months Jan – Nov 2016: 105 emails (0.5 emails / working day)
- Mean response time 23 hours
- Most common Qs:
  Risk factor modification (20%)
  Referral triggers (19%)
  Prescribing (19%)
  Management of decline in GFR (18%)
  BP (17%)
  Radiology advice (9%)

Zaman et al 2017
## Imperial CKD email service: data

<table>
<thead>
<tr>
<th>Number of GPs requesting referral to Nephrology outpatient clinic</th>
<th>21 (20%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advised to refer to Nephrology clinic at that point</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>Advised that referral currently not required</td>
<td>17 (81%)</td>
</tr>
<tr>
<td>Triggers for future referral identified</td>
<td>9 (43%)</td>
</tr>
<tr>
<td>Advised to refer to another speciality clinic</td>
<td>2 (10%)</td>
</tr>
</tbody>
</table>

Zaman et al 2017
Imperial CKD email service: data

• GP satisfaction: (41% response rate)
  100% would recommend to colleague
  100% satisfied with response and timeliness
  67% would have referred patient to OP if not used the email service (=30 patients in sample)
  10% would have sent patient to ED (4 patients)

• “the clearest advice of all the email advice services”

Zaman et al 2017
Virtual Triaging / Clinic

Primary Care

GP reviews patient and decides on referral
Records encounter on EMIS / S1
Obtains and records consent to share data
Referral made through ERS

Secondary/tertiary Care

Nephrologist reviews EMIS / S1 record
Records encounter on EMIS / S1
Letter to patient
Advice / vClinic / lxF2F
Thank you

Email advice: ICHC-tr.ckdadvice@nhs.net