Acute Kidney Injury

Dr Nick Selby

Consultant Nephrologist and Honorary Associate Professor
“One in five emergency admissions to hospital will have AKI”

“AKI is 100 times more deadly than MRSA infection”

“Around 20 per cent of AKI cases are preventable”

“Costs of AKI to the NHS are £434-620m pa”
## Definition of AKI

<table>
<thead>
<tr>
<th>AKIN stage</th>
<th>Serum creatinine criteria</th>
<th>Urine output criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>An increase of more than 26µmol/l above baseline (within a 48hr period) OR An increase of more than or equal to 1.5 to 2 fold from baseline</td>
<td>&lt;0.5mg/kg/hr for at least 6 hours</td>
</tr>
<tr>
<td>2</td>
<td>An increase of more than or equal to 2 to 3 fold from baseline</td>
<td>&lt;0.5mg/kg/hr for at least 12 hours</td>
</tr>
<tr>
<td>3</td>
<td>An increase of more than 3 fold from baseline OR Serum creatinine ≥355µmol/l with an acute rise of at least 45µmol/l OR Initiation of RRT</td>
<td>&lt;0.3mg/kg/hr for at least 24 hours OR Anuria for &gt;12 hours</td>
</tr>
</tbody>
</table>

Number of patients per annum sustaining each stage of AKI in 1000-bedded hospital:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2727</td>
</tr>
<tr>
<td>2</td>
<td>782</td>
</tr>
<tr>
<td>3</td>
<td>636</td>
</tr>
<tr>
<td>total</td>
<td>4145</td>
</tr>
</tbody>
</table>
High mortality rates in hospitalised patients with AKI

- In a UK hospital-wide population with AKI: **mortality 23.6%**

Selby NM et al CJASN 2012; 7(4): 533-40
‘reducing avoidable death, long-term disability and chronic ill health...’

• VTE prevention: estimate 25,000 deaths pa

Incidence of AKI is increasing

AKI not requiring dialysis

Dialysis-requiring AKI


Hsu RK et al. *JASN* 2013;24:37-42

* Per 100,000 person years

* Per million person years
The cost of AKI

COSTS OF AKI TO THE NHS IN ENGLAND IN 2009-10

<table>
<thead>
<tr>
<th></th>
<th>Lower estimate</th>
<th>Upper estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute admissions</td>
<td>£151m</td>
<td>£203m</td>
</tr>
<tr>
<td>Critical care</td>
<td>£141m</td>
<td>£217m</td>
</tr>
<tr>
<td>Renal replacement therapy</td>
<td>£142m</td>
<td>£200m</td>
</tr>
<tr>
<td>TOTAL</td>
<td>£434m</td>
<td>£620m</td>
</tr>
</tbody>
</table>

Patients with AKI stay an average of 4.7 days longer in hospital.

Source: NHS Kidney Care, The Economic Impact of Acute Kidney Injury
NCEPOD report published in 2009

- Poor assessment of risk factors for AKI – **missed opportunities for prevention**
- Delays in recognising AKI
- ‘Good’ care in <50% cases
- Post admission AKI avoidable in 21% of cases
- Problems accessing specialist services
AKI distribution across specialties

7.5% of patients under nephrology

Selby NM et al CJASN 2012; 7(4): 533
‘Community acquired’ AKI accounts for two-thirds of cases.

Selby NM et al. CJASN 2012; 7(4): 533
Pathfinder projects

• NHS England wishes to work with Clinical Commissioning Groups (CCGs) ....

...to achieve effective commissioning of care pathways that contain responsibilities of both CCGs and NHS England specialised services...

.... ensuring the access and egress from the specialised component is seamless and effective

<table>
<thead>
<tr>
<th>POC</th>
<th>Pathfinder</th>
<th>Responsible Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental Health</td>
<td>Forensic Pathway CRG</td>
<td>Mary Ann Doyle</td>
</tr>
<tr>
<td>Women and Children</td>
<td>Paediatric care pathways</td>
<td>Jacqui Kemp</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>Acute Kidney Injury pathway</td>
<td>Nesta Hawker</td>
</tr>
<tr>
<td>Cancer and Blood</td>
<td>Haemoglobinopathies</td>
<td>Jon Currington</td>
</tr>
<tr>
<td>Trauma</td>
<td>Back pain and sciatica</td>
<td>David Stockdale</td>
</tr>
</tbody>
</table>
AKI patient pathway

Care home residents

Patients at risk of AKI

Hospital admission with AKI

Hospital admission without AKI

Recovery and discharge

Specialist services including RRT

Increased risk of CKD

Increased CV risk

Increased risk of CKD

Increased CV risk

>90%

<10%

>90%

<10%
E-alerts for AKI

Education programme

2^0 care

Intranet Guidelines

Care bundles

Streamlined nephrology referral

Prevention
- Education
- Medication Mx
- Sick day rules

AKI in primary care

Follow up after AKI

Recognition and management
Process

- Scope care pathway and intended benefits
- Innovation: clinical/financial/commissioning
- Best practice pathway
- Proposals for development and implementation, overcome obstacles (financial, clinical and commissioning)
- Reporting process
The scale of the problem

- AKI is **common**
- AKI is associated with considerable **harm**
- AKI produces significant **costs**
- The course and development of AKI is **modifiable**