AKI Audit of Outcomes and Care Processes – A Proof of Concept

9th October 2012

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NHS Kidney Care

Better Kidney Care for All
Background

- AKI is common in patients admitted to hospital and is associated with longer length of stay and increased mortality.
- Some people with severe AKI suffer un-recoverable kidney injury (chronic kidney disease and long-term dialysis requirement).
- AKI can develop in patients from all specialities, but most frequently occurs in acute medical and surgical hospital admissions.
- A significant amount of AKI is amenable to simple interventions by non-specialist provided it is identified and correctly early.
Acute Kidney Injury: HES

- 2010-11 data, England:
- AKI (ICD-10 N17 or N280 recorded in 141,816 overnight admissions (1.7%)
- 138,356 patients
- 13% of admissions occur in people under the age of 60
- There are more admissions in males than in females for all age ranges below 80
HES: Mortality

- In 28% of admissions with a recorded AKI diagnosis, the patient died before leaving hospital
- Mortality rates and numbers of deaths rose with age
- The expected mortality rate for admissions in people of the same age and gender without AKI is 5%
- 33,076 excess deaths
AKI is common in patients admitted to hospital and is associated with longer length of stay and increased mortality.

Some people with severe AKI suffer un-recoverable kidney injury (chronic kidney disease and long-term dialysis requirement).

AKI can develop in patients from all specialities, but most frequently occurs in acute medical and surgical hospital admissions.

A significant amount of AKI is amenable to simple interventions by non-specialist provided AKI is identified and correctly early.
Definition of AKI

- AKI is defined as a rapid decrease in kidney function over a few hours or days.
- AKI has been classified by the international kidney quality improvement organisation KDIGO into three levels of severity (AKI stages 1, 2 and 3).
- AKI 3 reflects the most severe forms of AKI, is the most likely to need dialysis and has the worst outcomes with lengthened hospital stay and increased mortality.
Identification of AKI

- AKI can be identified either by a decrease in the volume of urine a person passes (in ml per kg body weight and reviewed over 6-24 hours), or by increase in the metabolic waste “creatinine” in the serum (blood).
- Although both can be used, raised serum creatinine is much more widely understood to signify AKI by clinicians, and is much easier to use in audit as it is routinely collected in all admissions and available electronically.
Purpose of AKI audit

- AKI has a high profile currently within the NHS as a way to reduce avoidable harm and dying prematurely (NHS outcomes framework domains 5 and 1).
- Several hospital trust have initiated detection algorithms within biochemistry systems.
- However this development is not universal and audit of care of patients detected by such systems is uncommon and highly fragmented.
Identifying cases for audit

- Expressions of interest were invited from acute hospital trusts in England which covered at least 300,000 population.
- Trusts were expected to implement a simple detection algorithm using the routine biochemical (creatinine) data from all patients admitted to their organisation to identify patients with AKI stage 3. Centres with an algorithm already in place could continue to use their existing one.
- Local clinical leadership for AKI was funded (generalist or biochemist) along with IT and audit officer support.
AKI 3 Detection algorithm

- Run on the trust biochemistry results system or other system fed by these results.
- Detect in-patients with either
  - Absolute serum creatinine > 354µmol/L (ideally excluding patients with stable CKD or ESRF)
  - Change in serum creatinine x3 from baseline (with inherent problems of setting the baseline)
Review of care processes

- Anonymous biochemical data from all the patients identified with AKI stage 3 is transmitted on a monthly basis to the East Midlands Public Health Observatory (EMPHO) who collect and validate the data.
- EMPHO provide back to the trust a list of 40 random cases in whom the case notes need to be reviewed to establish whether key care processes were completed and to determine patient outcomes.
- Both datasets, tools and proforma available at www.kidneycare.nhs.uk
Summary of information

- The results of the case notes review are sent back to EMPHO to be linked to the original biochemical information.
- Simple comparisons between the rates of AKI3 detected, the clinical settings, the achievement of key care processes, and the outcomes of patients with AKI3 will be reported.
## Case Notes Proforma

### EARLY AKI MANAGEMENT

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<td><strong>6.</strong></td>
<td>SENIOR REVIEW WITHIN 12HRS?</td>
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<td><strong>7.</strong></td>
<td>DIPSTICK ANALYSIS</td>
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<td><strong>8.</strong></td>
<td>ULTRASOUND INDICATED?</td>
<td>□ YES (Go to Q9)</td>
<td>□ NO (Go to Q11)</td>
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<td><strong>9.</strong></td>
<td>ULTRASOUND PERFORMED?</td>
<td>□ YES</td>
<td>□ NO</td>
<td>□ N/A</td>
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<td><strong>10.</strong></td>
<td>TIME BETWEEN USRecorded AS CLINICALLY INDICATED AND US PERFORMED</td>
<td>□ LESS THAN 12 HRS</td>
<td>□ BETWEEN 12 AND 24 HOURS</td>
<td>□ BETWEEN 24 AND 48 HOURS</td>
<td>□ GREATER THAN 48 HOURS</td>
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<td><strong>11.</strong></td>
<td>EARLY WARNING SCORE (EWS) IMPLEMENTED?</td>
<td>□ YES (Go to Q12)</td>
<td>□ NO (Go to Q13)</td>
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<td><strong>12.</strong></td>
<td>EWS AT TIME OF AKI DIAGNOSIS (ENTER SCORE 0 TO 14 OR N/A)</td>
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<td><strong>13.</strong></td>
<td>MEDICATION REVIEW?</td>
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### Subsequent Management

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<th>Question</th>
<th>Yes</th>
<th>No</th>
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<tr>
<td>14. Evidence for a discussion with a renal specialist documented</td>
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<td>15. Was the patient accepted for transfer to a renal unit?</td>
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<td>(Go to Q16, then skip to Q19)</td>
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<td>16. Time in hours between acceptance and transfer to renal unit from ward (enter N/A if not applicable)</td>
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<td>17. Was the patient accepted for a transfer to a critical care unit?</td>
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<td>(Go to Q18)</td>
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<td>18. Time between acceptance and transfer to critical care from ward (enter N/A if not applicable)</td>
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<td>19. Deterioration in condition (rise in EWS) whilst awaiting transfer?</td>
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<td>20. Death whilst awaiting transfer?</td>
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<td>21. Patient required renal replacement therapy?</td>
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## Outcomes

### 22. Main Presumptive Cause of AKI
- [ ] Hypovolaemia
- [ ] Sepsis
- [ ] Nephrotoxic Drug or Substance
- [ ] Urinary Tract Obstruction
- [ ] Intrictic Renal Disease (Usually but Not Necessarily Proven On Renal Biopsy)
- [ ] Other
- [ ] Not Stated by Clinical Staff in Medical Record or Discharge Summary

### 23. Date of Hospital Discharge (Enter Date in YYYYMMDD Format or 'Still in Patient')

### 24. Patient Alive One Calendar Month After Achieved Definition of AKI
- [ ] Yes (Go to Q25)
- [ ] No (Go to Q26)

### 25. Patient Kidney Function One Calendar Month After Achieving Definition of AKI
- [ ] On Dialysis
- [ ] Recovered to Baseline
- [ ] Above Baseline
- [ ] Not Applicable (For Example Patient Died)
- [ ] Not Available (For Example Creatinine Not Checked by Clinical Team)

### 26. Patient Discharged From Acute Trust
- [ ] Alive
- [ ] Deceased
- [ ] Not Applicable (Still Inpatient)
Initial results

- 47 acute trust in England taking part (of 163).
- Summary of trust characteristics.
- August biochemical data from 39.
- Notes review on-going.
Centre characteristics

- 68% have a renal unit on site, and of these 85% provide acute dialysis.
- 97% have a critical care unit on site, all of which provide 24hr access to RRT.
- 92% have access to a nephrostomy service (but only 43% have one that operates 24/7).
Centre characteristics

- 100% have an Early Warning Score system (61% of which include oliguria).
- 59% have a policy for senior review of admissions within 12hrs (31% in 24hrs).
- 50% have an alert system in place for elevated serum creatinine.
- 68% have a formal training programme for junior doctors about AKI.
Centre characteristics

• 63% have guidance on prevention and management of AKI.
• 37% have referral guidance to renal unit and similar percentage to critical care.
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<th>Trust</th>
<th>Number of emergency admissions 2010/11 Source: HES Online</th>
<th>Number of AKI cases submitted August</th>
<th>AKI cases per 1,000 emergency admissions/year</th>
<th>Trust</th>
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Next steps

• Six months biochemical data will complete end January 2013.
• 200 x 47 = 9400 case note reviews complete end February 2013.
• Report of finding from first Audit March 2013.
• Relevance to the NHS Outcomes Framework and NICE AKI guidance in 2013 drives to sustainability.
Further information

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