ACUTE KIDNEY INJURY (AKI) STUDY
National Confidential Enquiry into Patient Outcome and Death (NCEPOD)

Patient Care Questionnaire

Hospital number of patient: ____________________________________________

Name of NCEPOD Local Reporter: ________________________________________

Specialty of doctor completing form: ______________________________________

What Is this study about?

NCEPOD is examining the process of care of patients who die with a diagnosis of acute kidney injury (AKI) following admission to hospital, looking for areas where their care might have been improved (remediable factors). Data will be collected on all patients aged 16 years or over, who died with a primary diagnosis of acute kidney injury between 1st October 2006 and 31st March 2007. All NHS and independent hospitals that admit both acute and elective admissions in England, Wales and Northern Ireland; public hospitals in the Isle of Man, Jersey and Guernsey, as well as Defence Secondary Care Agency hospitals, will be included in the study.

Exclusions - Patients with known chronic kidney disease who have undergone regular renal replacement therapy prior to their final hospital episode

Questions or help?

If you have any queries about the study or this questionnaire, please contact NCEPOD at:
Email: acutekidneyinjury@ncepod.org.uk
Telephone: 020 7631 3444

Thank you for taking the time to complete this questionnaire. The findings of the full study will be published in late 2009.

How to complete this questionnaire?

Information will be collected using two methods: Box cross and free text, where your clinical opinion will be requested.

This form will be electronically scanned. Please use a black or blue pen. Please complete all questions with either block capitals or a bold cross inside the boxes provided e.g.

Was the patient referred to a nephrologist?

☒ Yes ☐ No

If you make a mistake, please “black-out” the incorrect box and re-enter the correct information, e.g.

☒ Yes ☐ No

Unless indicated, please mark only one box per question.

A list of definitions is provided on page 10.
Clinician specialty codes are listed on page 11

Please return the completed questionnaire and casenote extracts to NCEPOD in the SAE provided.

A copy must not be kept in the patient’s notes.

Non-returned questionnaires will be followed up with your medical director.

CPD Accreditation

Consultants who complete NCEPOD questionnaires make a valuable contribution to the investigation of patient care. Completion of questionnaires also provides an opportunity for consultants to review their clinical management and undertake a period of personal reflection. These activities have a continuing medical and professional development value for individual consultants. Consequently, NCEPOD recommends that consultants who complete NCEPOD questionnaires keep a record of this activity which can be included as evidence of internal/ self directed Continuous Professional Development in their appraisal portfolio.
Please supply copies of the following casenote extracts for this admission period when returning your questionnaire

Inpatient annotations.

Nursing Notes.

Biochemistry results (LFT, U&E).

Drug charts.

Fluid balance charts (including urine output).

Observation charts (including TPR, CVP).

Weight chart.

Urinalysis

X-ray/CT/USS results

Any operating notes.

Do Not Attempt Resuscitation (DNAR) statement

Post mortem report

Please provide a clinical summary of the patient's care in hospital
A. PATIENT DETAILS

1. Age at time of death: [ ] years [ ] Unknown

2. Gender: [ ] Male [ ] Female

B. THE ADMISSION

3. What was the date of admission? [ ] [ ] [ ] [ ]
   dd mm yyyy

4. What was the time of admission? [ ] [ ] [ ]
   (please use 24-hr clock)
   hh mm

5. Was the admission:
   [ ] A planned admission
   [ ] An emergency admission
   [ ] Inter-hospital transfer
   [ ] Unknown

6. a. Primary diagnosis on admission: 

6. b. Final diagnosis at death: 

7. a. Grade of doctor who undertook initial clerking
   (excluding Triage):
   [ ] FY1
   [ ] SPR/ST3 or higher
   [ ] FY2
   [ ] Staff Grade
   [ ] SHO/ST1-2
   [ ] Consultant
   [ ] FTSTA
   [ ] Other

7. b. Specialty of consultant patient admitted under
   (Please see codes on page 11)
C. RECOGNITION AND ASSESSMENT OF AKI

8. a. What were the patient's most recent U+Es and eGFR in the 6 months prior to admission (if available)?

Na [ ] mmol/L  [ ] unknown
K [ ] mmol/L
Urea [ ] mmol/L
Creatinine [ ] umol/L
eGFR [ ] ml/min  [ ] unknown

b. What was the date of the U+E measurements above?

d d m m y y

9. a. What were the patient's first U+Es and eGFR during this admission?

Na [ ] mmol/L  [ ] unknown
K [ ] mmol/L
Urea [ ] mmol/L
Creatinine [ ] umol/L
eGFR [ ] ml/min  [ ] unknown

b. What was the date of the above U+E measurements?

d d m m y y

10. a. Did the patient have evidence of kidney disease on admission?

[ ] Yes  [ ] No

b. If yes was this

[ ] *A new diagnosis
[ ] *Chronic  *CKD stage  
[ ] *Acute on Chronic  *stage of pre-existing CKD  

1 2 3 4 5

1 2 3 4 5

* See definitions at back of questionnaire

c. If indicated above, what was the aetiology of the the CKD?

11. If No to 10a was there any documented consideration that the patient was at risk of AKI?

[ ] Yes  [ ] No

12. What measures were made to specifically reduce the risk of AKI?
13. In the initial assessment at admission, which of the following factors were assessed and recorded in the patient’s casenotes? 

- Age
- Sepsis
- Co-morbidity
- Biochemistry
- Medication
- Urinalysis
- Previous CKD
- Weight
- Hypovolaemia
- Nutritional state

14. a. If the patient developed AKI post-admission was this recognised immediately? 

- Yes
- No
- NA

b. If no how long was the delay? 

- [ ] days
- [ ] hours

c. Why was there a delay? 

15. a. If the patient developed AKI post-admission was this in the post-operative period? 

- Yes
- No
- NA

b. If yes how long post-op? 

- [ ] days
- [ ] hours

c. In your opinion was this directly related to: 

- Poor surgical technique
- Complications of surgery
- Poor post-operative management
- Other

16. How was the AKI recognised? 

(answers may be multiple)

- Deteriorating biochemistry
- Oliguria
- Anuria
- Other

17. a. If the patient developed AKI post-admission what were the patients U+Es at the time AKI was recognised? 

- Na: [ ] mmol/L
- K: [ ] mmol/L
- Urea: [ ] mmol/L
- Creatinine: [ ] umol/L

b. What was the date and time of the U+E measurements above? 

Time (please use 24-hr clock)?

d d m m y y
h h m m

18. What *stage AKI was the patient in? 

* See definitions at back of questionnaire

- Stage 1
- Stage 2
- Stage 3
19. Was urinalysis undertaken?  

20. At the time the AKI was recognised which of the following contributory factors were assessed/considered?

- Sepsis
- Drugs
- Hypovolaemia
- Clinicalexamination
- Fluidprescription
- Fluidbalancecharts
- Electrolytes
- Recentuseofcontrast
- Contributoryco-morbidty

What was the clinical basis for this assessment of hypovolaemia (answers maybe multiple)?

- Clinical examination
- Fluid balance charts
- Fluid prescription
- Electrolytes
- Other

21. In the assessment of the patient with AKI, which of the following modalities were employed (answers maybe multiple)?

- Fluid balance
- Urinalysis
- MRI
- Sepsis recognition
- USS
- CT
- Acid base balance
- Renal biopsy
- Other

22. Was a definitive diagnosis made to explain the cause of AKI?

- Yes
- No

If yes diagnosis

23. If the AKI was due to contrast nephropathy were any of following preventative measures undertaken (answers maybe multiple)?

- Discussion with radiologist
- Pre-contrast hydration

Which IV fluid was used?

- Cessation of ACE inhibitors/NSAIDS
- N-acetylcysteine
24. Did the AKI occur as single or part of multiple organ failure? 
   - Single 
   - Multiple 
   - Unknown

**D. MANAGEMENT OF AKI**

25. Please indicate which of the following were done to manage the patients AKI (answers maybe multiple)

- [ ] TPR chart
- [ ] Fluid balance chart
- [ ] Daily weight chart
- [ ] Catheter
- [ ] Hourly urine output measurements
  - Yes
  - No
- [ ] CVP
- [ ] Correction of hypovolaemia

Type of fluid administered

- [ ] Regular monitoring of biochemistry
- [ ] Cessation of nephrotoxic drugs (including diuretics)
  - Which drugs
- [ ] Diuretics administered
- [ ] Other drugs administered
  - Which drugs
- [ ] Patients medications altered to 'renal doses'
  - If yes which drugs?
- [ ] Review by renal dietitian or nutrition team
- [ ] Other
### E. REFERRAL AND SUPPORT

#### 26. a. Was the patient referred to a nephrologist?
- [ ] Yes
- [ ] No

**If yes how long after the patient developed AKI?**
- [ ] days
- [ ] hours

**If the patient was referred to a nephrologist what was offered (answers may be multiple)?**
- [ ] Telephone advice
- [ ] Transfer to HDU/ITU
- [ ] Ward review
- [ ] Transfer to renal unit

**Was there difficulty in contacting a nephrologist?**
- [ ] Yes
- [ ] No

**If the patient was transferred/admitted to a renal unit did they receive RRT?**
- [ ] Yes
- [ ] No

**If yes what type of RRT?**
- [ ] Intermittent Haemodialysis
- [ ] Continuous Haemodialysis
- [ ] Intermittent Haemofiltration
- [ ] Continuous Haemofiltration
- [ ] Peritoneal dialysis

**If yes what?**

**Were there any complications associated with the RRT?**
- [ ] Yes
- [ ] No
- [ ] NA

**If yes what?**

#### 27. a. Did the patient receive renal support/RRT in a level 2/3 setting (other than a renal unit)?
- [ ] Yes
- [ ] No
- [ ] NA

**If yes what type of RRT?**

**Were there any complications associated with the RRT?**
- [ ] Yes
- [ ] No
- [ ] NA

**If yes what?**

**Were there any complications associated with the RRT?**
- [ ] Yes
- [ ] No
- [ ] NA

**If yes what?**

**If a decision was made not to treat the AKI who was involved in the decision? (answers may be multiple)**
- [ ] Consultant in charge
- [ ] Renal team
- [ ] ITU/HDU
- [ ] Patient
- [ ] Relatives
29. Which of the following complications occurred and which treatments were used to correct?

<table>
<thead>
<tr>
<th>Complication</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperkalaemia</td>
<td>Calcium gluconate</td>
</tr>
<tr>
<td></td>
<td>Insulin/dextrose</td>
</tr>
<tr>
<td></td>
<td>Bicarbonate</td>
</tr>
<tr>
<td></td>
<td>Salbutamol nebulisers</td>
</tr>
<tr>
<td></td>
<td>Bicarbonate</td>
</tr>
<tr>
<td>Acidosis</td>
<td>RRT (type)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
<tr>
<td>Oedema</td>
<td>Diuretics</td>
</tr>
<tr>
<td></td>
<td>Albumin</td>
</tr>
<tr>
<td></td>
<td>RRT (type)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
<tr>
<td>Sepsis</td>
<td>Antibiotics</td>
</tr>
<tr>
<td></td>
<td>Inotropic drugs</td>
</tr>
<tr>
<td></td>
<td>Drainage of septic focus</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
<tr>
<td>Serositis</td>
<td>RRT (type)</td>
</tr>
<tr>
<td>Encephalopathy</td>
<td>RRT</td>
</tr>
</tbody>
</table>

30. a. On review of this case do you think the AKI was avoidable?  
   - Yes  - No

b. Please expand on your answer:
# DEFINITIONS

<table>
<thead>
<tr>
<th>Mode of presentation</th>
<th>Inclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute renal failure</td>
<td>Presented unexpectedly with normal sized kidneys, or presented after known renal insult, previous renal function normal, or presented after known renal insult, previous function unknown but normal size kidneys</td>
</tr>
<tr>
<td>Acute-on-chronic</td>
<td>Presented either unexpectedly or after a known renal insult and known to have had previous serum creatinine &gt; 150 mmol/l, or shown on ultrasound to have at least one small kidney (&lt; 8 cm)</td>
</tr>
<tr>
<td>Chronic renal failure</td>
<td>Known to have had chronic renal failure followed by a physician, no obvious renal insult precipitating requirement for dialysis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CKD Stage</th>
<th>Estimated GFR (mL/min/1.73 m²)</th>
<th>Urine output criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90+</td>
<td>Normal kidney function but urine findings or structural abnormalities or genetic trait point to kidney disease</td>
</tr>
<tr>
<td>2</td>
<td>60-89</td>
<td>Mildery reduced kidney function and other findings (as stage 1) point to kidney disease</td>
</tr>
<tr>
<td>3</td>
<td>30-59</td>
<td>Moderately reduced kidney function</td>
</tr>
<tr>
<td>4</td>
<td>15-29</td>
<td>Severely reduced kidney function</td>
</tr>
<tr>
<td>5</td>
<td>&lt;15</td>
<td>Very severe or endstage kidney failure (sometimes called established renal failure)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AKI Stage</th>
<th>Serum creatinine criteria</th>
<th>Urine output criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Increase in serum creatinine of more than or equal to 0.3 mg/dl (≥ 26.4 μmol/l) or increase in more than or equal to 150% to 200% (1.5- to 2-fold) from baseline</td>
<td>Less than 0.5 ml/kg per hour for more than 6 hours</td>
</tr>
<tr>
<td>2</td>
<td>Increase in serum creatinine to more than 200% to 300% (&gt; 2- to 3-fold) from baseline</td>
<td>Less than 0.5 ml/kg per hour for more than 12 hours</td>
</tr>
<tr>
<td>3</td>
<td>Increase in serum creatinine to more than 300% (&gt; 3-fold) from baseline (or serum creatinine of more than or equal to 4.0 mg/dl [≥ 354 μmol/l] with an acute increase of at least 0.5 mg/dl [44 μmol/l])</td>
<td>Less than 0.3 ml/kg per hour for 24 hours or anuria for 12 hours</td>
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<tr>
<td>Code</td>
<td>Specialty</td>
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<td>------</td>
<td>-----------------------------------------------</td>
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<tr>
<td>100</td>
<td>General Surgery</td>
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<tr>
<td>101</td>
<td>Urology</td>
<td></td>
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<tr>
<td>103</td>
<td>Breast Surgery</td>
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<tr>
<td>104</td>
<td>Colorectal Surgery</td>
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<tr>
<td>105</td>
<td>Hepatobiliary &amp; Pancreatic Surgery</td>
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<td>106</td>
<td>Upper Gastrointestinal Surgery</td>
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<tr>
<td>107</td>
<td>Vascular Surgery</td>
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<tr>
<td>110</td>
<td>Trauma &amp; Orthopaedics</td>
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<tr>
<td>120</td>
<td>Ear, Nose and Throat (ENT)</td>
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<tr>
<td>130</td>
<td>Ophthalmology</td>
<td></td>
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<tr>
<td>143</td>
<td>Maxillo-Facial Surgery</td>
<td></td>
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<tr>
<td>150</td>
<td>Neurosurgery</td>
<td></td>
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<tr>
<td>160</td>
<td>Plastic Surgery</td>
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<tr>
<td>161</td>
<td>Burns Care</td>
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<tr>
<td>170</td>
<td>Cardiothoracic Surgery</td>
<td></td>
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<tr>
<td>171</td>
<td>Paediatric Surgery</td>
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<tr>
<td>172</td>
<td>Cardiac Surgery</td>
<td></td>
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<tr>
<td>173</td>
<td>Thoracic Surgery</td>
<td></td>
</tr>
<tr>
<td>180</td>
<td>Accident &amp; Emergency</td>
<td></td>
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<tr>
<td>186</td>
<td>Anaesthetics</td>
<td></td>
</tr>
<tr>
<td>192</td>
<td>Critical or Intensive Care Medicine</td>
<td></td>
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<tr>
<td>300</td>
<td>General Medicine</td>
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<tr>
<td>301</td>
<td>Gastroenterology</td>
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<td>302</td>
<td>Endocrinology</td>
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<td>306</td>
<td>Hepatology</td>
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<td>307</td>
<td>Diabetic Medicine</td>
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<td>314</td>
<td>Rehabilitation</td>
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<tr>
<td>320</td>
<td>Cardiology</td>
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<tr>
<td>321</td>
<td>Paediatric Cardiology</td>
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<tr>
<td>340</td>
<td>Thoracic/Respiratory Medicine</td>
<td></td>
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<tr>
<td>360</td>
<td>Genito-Urinary Medicine</td>
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<tr>
<td>361</td>
<td>Nephrology</td>
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<td>400</td>
<td>Neurology</td>
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<td>401</td>
<td>Clinical Neuro-Physiology</td>
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<tr>
<td>420</td>
<td>Paediatrics</td>
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<tr>
<td>421</td>
<td>Paediatric Neurology</td>
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<tr>
<td>430</td>
<td>Gynaecology</td>
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<td>Medicine</td>
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<td>Interventional Radiology</td>
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<td>520</td>
<td>General Pathology</td>
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<tr>
<td>521</td>
<td>Blood Transfusion</td>
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<tr>
<td>522</td>
<td>Chemical Pathology</td>
<td></td>
</tr>
<tr>
<td>523</td>
<td>Haematology</td>
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