

# Acute Kidney Injury (AKI)

## Primary Care & Laboratory ALERTS

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# 1. OVERVIEW

- Introduction to AKI
- AKI Laboratory alerts
- Primary care response
- AKI Hospital CQUIN



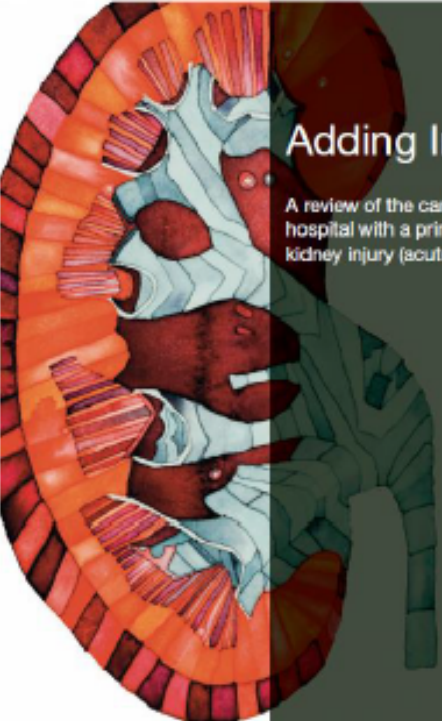
BEK

# What is acute kidney injury?

Acute kidney injury (AKI) is a rapid deterioration of **renal** function, resulting in inability to maintain fluid, electrolyte and acid-base balance. It normally occurs in the context of other serious illness (e.g. sepsis) on a background of risk.



"Wait a minute here, Mr. Crumbley. ... Maybe it isn't kidney stones after all."



## Adding Insult to Injury

A review of the care of patients who died in hospital with a primary diagnosis of acute kidney injury (acute renal failure).

NCEPOD

SUMMARY

## Acute kidney injury

Prevention, detection and management of acute kidney injury up to the point of renal replacement therapy

Issued: August 2013

NICE clinical guideline 169  
[guidance.nice.org.uk/cg169](http://guidance.nice.org.uk/cg169)

# Could preventing Acute Kidney Injury (AKI) hold the key to cutting the number of avoidable deaths in the NHS?

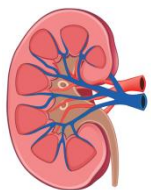
One in five emergency admission to hospital with have AKI

60% of AKI cases start in the community

AKI is 100x more deadly than MRSA infection

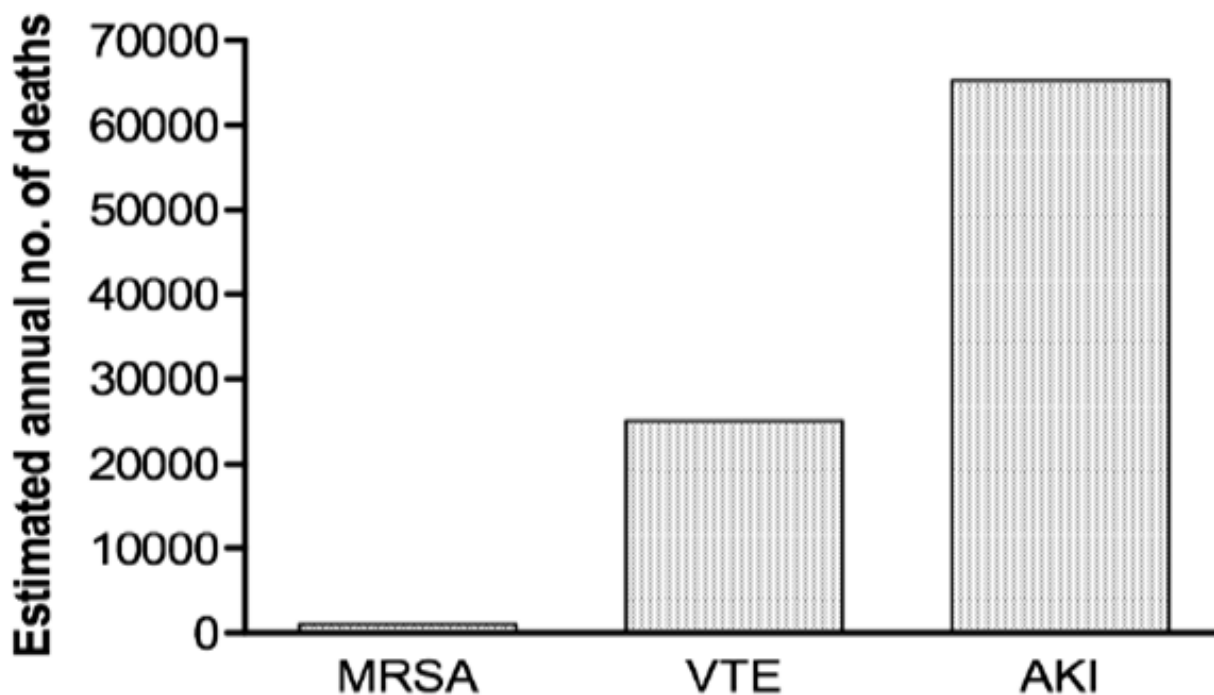
Around 30% of AKI cases are PREVENTABLE

Cost to NHS around **£500million per year!**

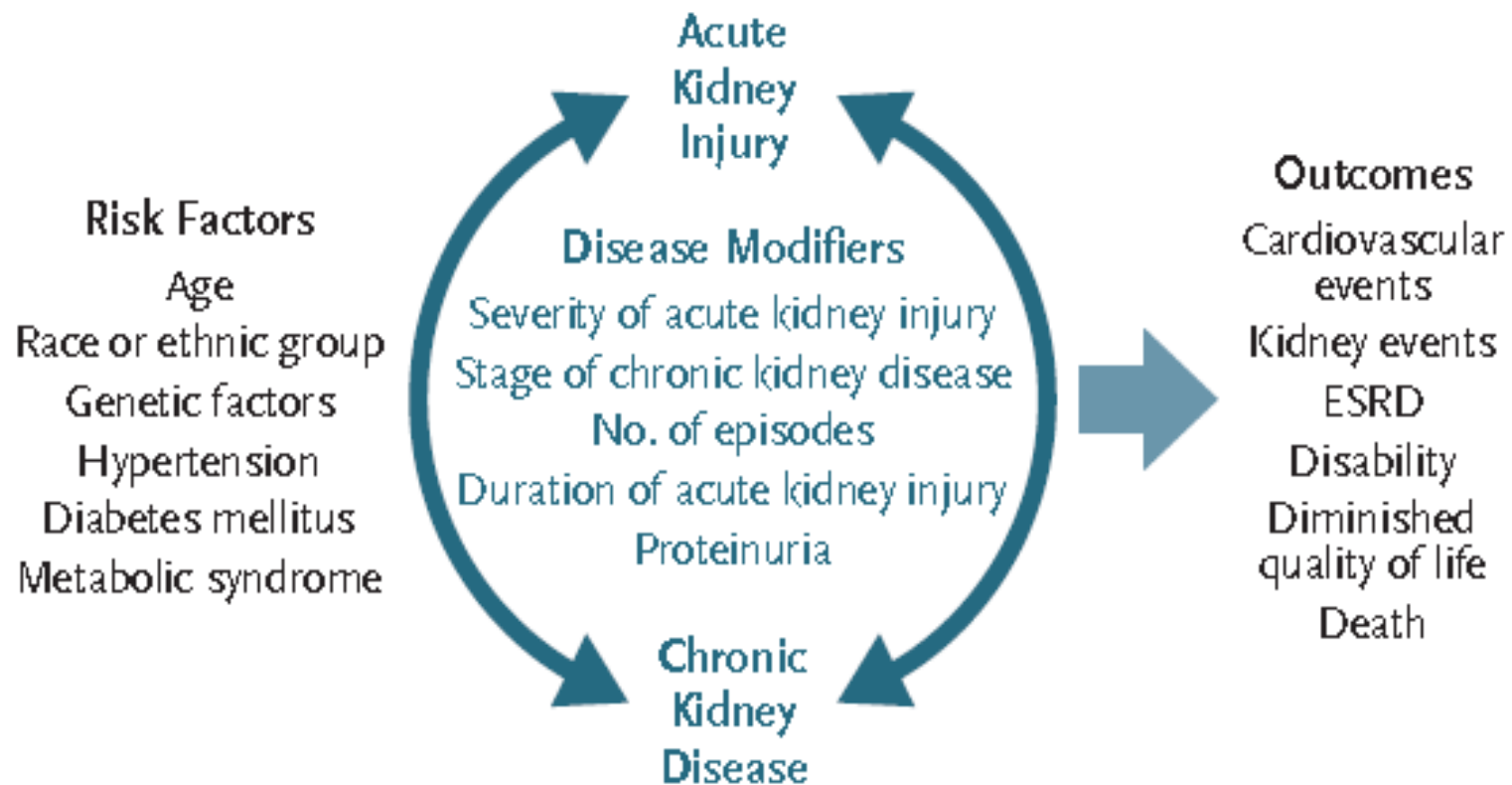


# Excess Deaths and AKI

**'Over 60,000 excess deaths per year' (Kerr et al April 2014)**



# AKI and CKD: 'Inter-connected Syndrome'





## **What can we do?**

Early detection, better treatment





## Patient Safety Alert

### Stage Three: Directive

*Standardising the early  
identification of  
Acute Kidney Injury*

9 June 2014

Alert reference number: NHS/PSA/D/2014/010

Alert stage: Three - Directive

### Actions

**Who:** NHS acute trusts  
and foundation  
trusts providing  
pathology services

**When:** By 9 March 2015

Patient Safety | Domain 5  
[www.england.nhs.uk/patientsafety](http://www.england.nhs.uk/patientsafety)

Contact us: [patientsafety.enquiries@nhs.net](mailto:patientsafety.enquiries@nhs.net)  
Sign up for regular updates: [www.england.nhs.uk/patientsafety](http://www.england.nhs.uk/patientsafety)

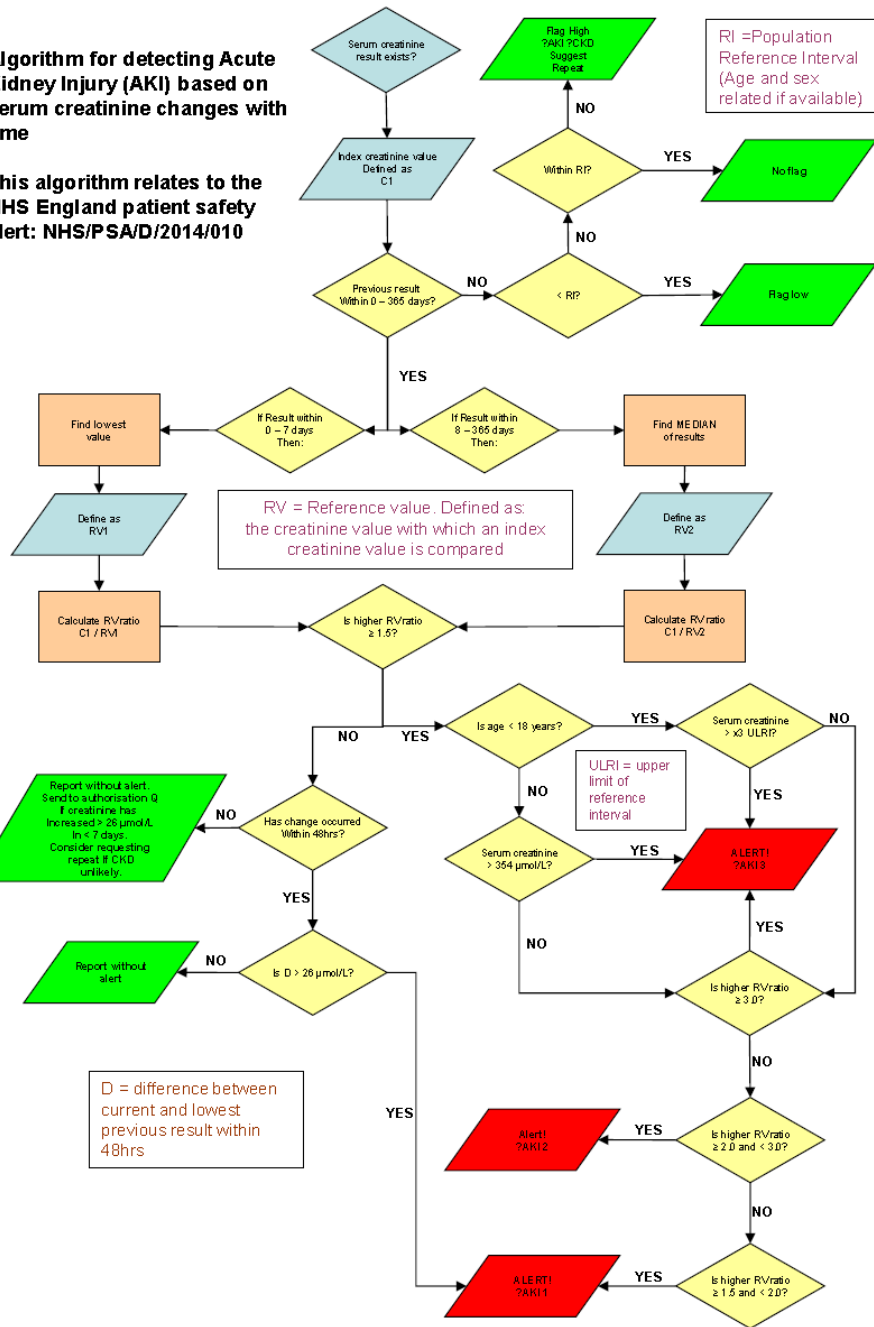
Publications Gateway Reference: 01702

© NHS England June 2014

Primary Care AKI Alerts to be in place by April 2016

**Algorithm for detecting Acute Kidney Injury (AKI) based on serum creatinine changes with time**

This algorithm relates to the NHS England patient safety alert: NHS/PSA/D/2014/010



## Algorithm Key Points

Creatinine Measured (C1)

C1 compared to previous results on ICE to determine baseline change

If previous result within 0-365 days

- **Within 0-7 days** = Lowest creatinine value used for baseline
- **Within 8-365 days** = Median creatinine used for baseline

Ratio of creatinine (C1:reference) rise then assessed for AKI Stage

If **NO** previous result within 365 days but C1 is greater than reference index for population then flagged ?AKI or CKD. Repeat sample suggested

## ALGORITHM SUMMARY: AKI Stage

AKI Stage KDIGO	Serum Creatinine (Cr) ( $\mu\text{mol/L}$ )
<b>1</b>	Cr $\uparrow \geq 1.5\text{x}$ from baseline Cr $\uparrow \geq 26\mu\text{mol/L}$ in 48hr
<b>2</b>	Cr $\uparrow \geq 2\text{x}$ from baseline
<b>3</b>	Cr $\uparrow \geq 3\text{x}$ from baseline Cr $\geq 354\mu\text{mol/L}$ and meets at least AKI Stage 1 criteria Cr $> 3\text{x}$ upper limit normal in $< 18\text{yr}$ old

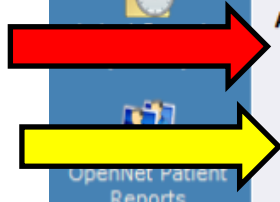
# ICE: What is reported?

The screenshot displays the sunquest ICE Desktop Live interface. On the left is a vertical navigation menu with options: Patient Search, Discharge Reporting, Cumulative Reports, View Patient Reports, View Ward Reports, and OpenNet Patient Reports. The main content area shows patient details (Name, Date of Birth, Address, Hospital Number, NHS Number) and a report table. The report table has columns: Reported, Specialty, Location, Clinician, and Status. A single report is listed: Reported on 22 Feb 2015 16:14, Specialty Chemical Pathology, Location (with an info icon), Clinician Dr D. (DS2) Diabetes (Diabetic Medicine), and Status F. Below the table, there is a section for 'Additional information is available for this report' with links to 'AKI AKI Care Bundle Checklist and Quick Ref Guide (22 Feb 2015 16:21)' and 'Nursing Care Guideline (22 Feb 2015 16:21)'. Another section states 'This report is linked to other reports. Click on the links below to see these linked reports:' with a link to 'UE (22 Feb 2015 16:02)' and a note '- Filed because: Filed in accordance with departmental SOP'. The 'Reasons for Request' section lists 'Hyponatraemia and urinary retention.' The 'Sample' section shows 'Sample IB296911N (BLOOD) Collected 22 Feb 2015 14:00 Received 22 Feb 2015 15:32'. The 'AKI STAGE' section contains a table with 'AKI Warning Stage' and the value '1', which is circled in red. Below this, a text block explains: 'The change in creatinine result suggests that this patient may have Acute Kidney Injury (AKI). Please review patient and refer to attached guidelines. In the presence of acute kidney injury, eGFR and CKD stage will be invalid.'

Reported	Specialty	Location	Clinician	Status
22 Feb 2015 16:14	Chemical Pathology		Dr D. (DS2) Diabetes (Diabetic Medicine)	F

AKI STAGE
AKI Warning Stage
1

AKI Stage  
1, 2 or 3  
Action  
Message



# Management of **ACUTE KIDNEY INJURY (AKI)** in ADULTS in Primary Care



## AKI e-Alert RESPONSE

**AKI Stage 1**

**CREATININE RISE**  
between 1.5 and 1.9x from normal baseline

**AKI Stage 2**

**CREATININE RISE**  
between 2 and 2.9x from normal baseline

**AKI Stage 3**

**CREATININE RISE**  
3x from normal baseline

**NO**

Manage In Community

Close follow-up  
Early repeat of Creatinine and monitoring of Potassium (K+)

**STOP-AKI**

Review Clinical State  
24 - 48hrs  
(use rapid response team if necessary)  
Discuss with Medical Team if On-going Concerns

Is the patient **ACUTELY UNWELL?**  
AKI Complications?  
Need IV Fluids?  
Worsening AKI?  
On-going Concerns?

**YES**

**Admit if Stage 3 AKI**

Clinically Unwell and/or high NEWS / Sepsis  
Any AKI STAGE with no clear cause  
If inadequate response to initial treatment

A possible diagnosis that may need specialist treatment:  
AKI with suspicion of urinary tract obstruction or intrinsic renal disease, pregnant, Urinalysis  $\geq 2+$  Blood AND Protein, Systemic symptoms (e.g. arthralgia, rash, epistaxis, haemoptysis)  
(Think glomerulonephritis, vasculitis, interstitial nephritis, myeloma)

AKI Complications: hyperkalaemia (K $>$ 6.0mmol/L), fluid overload, uraemia

Prior chronic kidney disease (CKD) stage 4 or 5 & added AKI. A renal transplant with any AKI

**Immediately REFER TO LOCAL HOSPITAL Medical SPR**

Consider Urgent discussion with Renal / Urology dependent on suspected cause and AKI severity

## STOP-AKI

**SEPSIS:** Recognise and treat infection. Do Urinalysis: If protein / leucocytes / nitrites: send MSU. Start Antibiotics. Check FBC, U&E at least every 48-72hrs until clinically stable

**TOXINS:** hold nephrotoxic drugs  
- NSAIDs (ibuprofen, naproxen)  
- ACE inhibitors  
- Angiotensin II Recept. Blockers  
- Nitrofurantoin  
- Allopurinol

**OPTIMISE:** BP and Fluid state  
-If dehydrated, **encourage oral** fluid intake  
-If fluid overload: Refer Medics  
-If HYPOTENSIVE, STOP anti-hypertensives/ diuretics until situation stable and BP returned to patient's norm

**PREVENT Harm: Drug Review Sick day Rules**  
Stop / Adjust dose:  
- Metformin (hyperlactaemia)  
- Proton pump inhibitors  
- Opiates (accumulates)  
- Sulphasalazine / Lithium  
Discuss with specialists re: dose reduction in AKI  
Aim to identify AKI Cause:  
Think Pre-renal, Intrinsic Renal disease and Obstructive causes

# STOP-AKI

**S** - Sepsis

**T** - Toxins

**O** - Optimise BP

**P** - Prevent Harm



Table 9 - National CQUIN Indicators 2015/16

## CQUIN Indicators

### Physical Health: Acute Kidney Injury (AKI)

To improve the follow up and recovery for individuals who have sustained AKI, reducing the risks of re-admission, re-establishing medication for other long term conditions and improving follow up of episodes of AKI which is associated with increased cardiovascular risk in the long term

### Physical Health: Sepsis

The Trust is required to screen for sepsis all those patients for whom sepsis screening is appropriate, and to rapidly initiate intravenous antibiotics within 1 hour of presentation for those patients who have suspected severe sepsis

### Mental Health: Dementia

To support the identification of patients with dementia in combination alongside other medical conditions

### Urgent & Emergency Care

Improving the recording of diagnosis in the Emergency Department and ED mental health re-attendances





# Acute Kidney Injury (AKI)

Patients who have had an episode of AKI are at increased risk of future Chronic Kidney Disease and worse outcomes including death

## The GP Discharge letter (D1) must include:

- AKI Severity (KDIGO Stage 1, 2 or 3):** Please document AKI Stage, any Risk Factors, Cause of AKI and Discharge Kidney Function (e.g. U&Es and/or eGFR. See <http://pathlabs.rbuht.nhs.uk/eGFRcalculator.htm> for online eGFR calculator)
- Medications Advice:** document any medications held and those that need to be reviewed / reintroduced by the GP
- Early Follow-up** is key. Please state what AKI follow-up arrangements are required, dependent on severity and recovery of AKI and with whom (e.g. with GP, Hospital physician or Renal Team) on discharge
- Type and frequency of blood tests:** Blood test are only required on discharge for monitoring if nephrotoxic drugs are to be introduced or ongoing/unresolved AKI issues remain. Please state proposed plan for discharge monitoring.

**Early Detection &  
Better Treatment  
of AKI  
Will SAVE Lives!**

Stage	Serum Creatinine (Cr) <u>Increase</u>	Urine Output (UO)
1	1.5-1.9x baseline OR $\geq 26.5 \mu\text{mol/L}$	$< 0.5 \text{ml/kg/hr}$ for 6-12hrs
2	2.0-2.9x baseline	$< 0.5 \text{ml/kg/hr}$ for $\geq 12 \text{hrs}$
3	3.0x baseline OR Rise $\geq 353.6 \mu\text{mol/L}$ OR Initiation of Renal Replacement Therapy OR, in patients $< 18 \text{yrs}$ old, decrease in eGFR to $< 35 \text{ml/min per } 1.73 \text{m}^2$	$< 0.3 \text{ml/kg/hr}$ for $> 12 \text{hrs}$ OR Anuria for $\geq 12 \text{hrs}$

**Patients need YOU to fill in the D1s correctly and include all required AKI information**

The AKI CQUIN target is worth  $> \pounds 250 \text{K}$  per year to Barnsley Hospital. This money will be lost if we fail to achieve the  $> 95\%$  compliance D1 target, directly affecting patient care and the services that we can offer.

**Improved AKI care = Improved Outcomes for Everyone! Thank you for your efforts!**