

# Responding to Acute Kidney Injury

## Warning Stage Test Results in Primary Care



From April 2016 primary care will start receiving Acute Kidney Injury (AKI) warning stage test results when a significant change in creatinine concentration is measured. This is as a result of a new detection algorithm, which was recommended for implementation in path labs' information management systems across the country, through an NHS England Patient Safety Alert, in June 2014.

GPs and practice nurses will want to know how to respond to the alerts, which identify potential cases of acute kidney injury in real time, producing a test result (AKI stage 1, 2 or 3) alongside the serum creatinine result. The result, called 'AKI Warning Stage' will be delivered directly to the GP clinical IT systems of the requesting GP or practice nurse.

**Help is at hand** in managing these results, which are likely to be small in number (1 alert per whole time GP per 1-2 months). Think Kidneys has produced a number of resources to help clinicians decide the appropriate response to the test result, and to help establish a process for timely communication of the test results to both in and out-of-hours primary care services.

**The resources** have been designed to help primary care manage AKI and are all online at <https://www.thinkkidneys.nhs.uk/aki/resources/primary-care/>

- Short film on AKI and Primary Care
- Response Times to AKI Warning Stage Test Results for Adults in Primary Care  
This at-a-glance resource explains what actions to take when, when to treat or when to refer.
- Recognising and Responding to AKI in Primary Care – Understanding cause, possible medication factors, fluid volume status and options for review.
- Guidelines for Medicines Optimisation in Patients with AKI - Medicines management for patients with, or at risk of AKI, e.g. which meds should or shouldn't be suspended, which may be used with caution and alternative therapeutic options.
- Quick Guide to Potentially Problematic Drugs and Actions to Take in Primary Care
- When or if to re-start drugs after an episode of AKI
- Useful Patient Leaflets
- Best Practice Guidance - Responding to AKI Warning Stage Test Results in Primary Care which provides more detail on factors to consider when responding to results for adults, including, for example, the stages of AKI, history of acute illness, co-morbidities and risk factors.

**Table 1. Acute Kidney Injury: Recommended response times to AKI Warning Stage Test Results for Adults in Primary Care**

AKI Warning Stage Test Result Confirm or refute automated AKI Test Result by comparing patient's current creatinine within clinical context against baseline creatinine	Clinical Context Within Which Blood Test Taken <sup>†</sup>	
	LOW Pre-test Probability of AKI Stable Clinical Context	HIGH Pre-test Probability of AKI Context of Acute Illness
<b>AKI Warning Stage 1</b> Current creatinine $\geq 1.5 \times$ baseline level (or creatinine rise $>26 \text{ mol/L}$ 48 hrs)	Consider clinical review $\leq 72$ hours of e-alert* If AKI confirmed $\rightarrow$ manage as per table 2	Consider clinical review $\leq 24$ hours of e-alert* Likely Stage 1 AKI $\rightarrow$ manage as per table 2
<b>AKI Warning Stage 2</b> Current creatinine $\geq 2 \times$ baseline level	Consider clinical review $\leq 24$ hours of e-alert* If AKI confirmed $\rightarrow$ manage as per table 2	Consider clinical review $\leq 6$ hours of e-alert* Likely Stage 2 AKI $\rightarrow$ manage as per table 2
<b>AKI Warning Stage 3</b> Current creatinine $\geq 3 \times$ baseline level (or creatinine $1.5 \times$ baseline and $>354 \text{ mol/L}$ )	Consider clinical review $\leq 6$ hours of e-alert* If AKI confirmed $\rightarrow$ consider admission	Consider immediate admission* Likely Stage 3 AKI

**†Clinical Context**

Why was the blood test taken?

- Routine chronic disease monitoring
- Drug monitoring
- Assessment of acute illness

Creatinine rise within stable clinical context may reflect unstable CKD instead of AKI, especially if longer time period between current and baseline creatinine.

**\*AKI Risk Factors/Clinical Features Prompting Earlier Review**

- Poor oral intake/urine output
- Evidence of hyperkalaemia, especially if moderate/severe ( $6.0-6.4$ ) or severe ( $\geq 6.5$ )
- Known history of CKD stages 4 & 5 or history of kidney transplant
- Deficient immunity
- Frail with co-morbidities (CKD, diabetes, heart failure, liver disease, neurological or cognitive impairment)
- Past history of AKI
- Suspected intrinsic kidney disease
- Suspected urinary tract obstruction

<sup>†</sup> UK Renal Association Clinical Practice Guidelines (2014) recommends emergency assessment and treatment of severe hyperkalaemia ( $K^+ \geq 5.5 \text{ mmol/l}$ ) – click here  
Refer to main guidance document – Responding to AKI Warning Stage Test Results for Adults in Primary Care

The table is a guide to support an initial response to an AKI Warning Stage Test Result but clinical judgement must prevail.  
The table does not apply to children and young people (<18 years) or patients receiving end of life care.

**Table 2: Recognising and Responding to Acute Kidney Injury for Adults in Primary Care\***

"Think" Cause	"Think" Medication <sup>†</sup>	"Think" Fluids	"Think" Review <sup>‡</sup>
History of acute illness? • Think Sepsis • Think Hypotension	Any medication which could exacerbate AKI? Consider withholding: • NSAIDs • Diuretics • Antihypertensive medication	What is the patient's volume status? If hypovolaemia present: • When did patient last pass urine? • Can the patient increase fluid intake? • Is admission for IV fluid replacement and monitoring required?	Does the patient need acute admission? If not, when will you review? Have you ensured handover? <sup>‡‡</sup>
Intrinsic kidney disease? (E.g. vasculitis) • Think Urinalysis	Any medication which may accumulate and cause harm during AKI?  Any new medication that may cause AKI? (E.g. drug induced tubulointerstitial nephritis)	Does the patient have and/or need carer support?	

\* Refer to main guidance document – Responding to AKI Warning Stage Test Results in Primary Care  
† Refer to medicines optimisation toolkit for primary care <http://www.thinkkidneys.nhs.uk/aki/medicines-optimisation-for-aki>  
‡ Refer to overarching principles in communication of diagnostic test results <https://www.england.nhs.uk/patientsafety/discharge>

The table is a guide to support recognition and response to AKI in primary care  
The table does not apply to children and young people (<18 years) or patients receiving end of life care

**(Almost) everything you need to know about your kidneys**

**What causes kidney problems?**

- One of the most common causes of kidney disease is diabetes.
- There are many others including genetic and inflammatory conditions, blockages of urine and high blood pressure that can be a cause and/or consequence of kidney problems.
- About 1 in 10 people have some form of Chronic Kidney Disease (CKD).
- CKD is a long term loss of kidney function which can be harmful. Not all CKD gets worse but it can lead to kidney failure. CKD also increases the risk of heart attack or stroke and increases the risk of acute kidney injury.
- Acute kidney injury (AKI) is serious and can occur when a person is unwell and a quick reduction in kidney function. Finding AKI in the early stages is very important as it can make other health problems more difficult to treat.
- Of emergency admissions to hospital 1 in 5 people have AKI.
- AKI can occur after major surgery or with heart problems. Up to 100,000 deaths in hospital in the UK each year are associated with AKI. It causes harm and suffering and costs a lot.

**Why you need to think kidneys**

- If you are worried about your kidneys visit your GP and find out if screening is necessary.
- Always 'Think Kidneys' when visiting your GP as CKD and AKI often show few symptoms.
- Your kidneys are remarkable and can look after you at just 10% functionality.
- AKI often gets better and can even recover fully as the underlying problems are treated.

**What do your kidneys do?**

- Make urine**: Regulate salt and water in your body, making about 3-4 pints of urine each day. Remove waste products from your blood into your urine.
- Produce hormones**: Regulate your blood pressure.
- Activate Vitamin D**: Create erythropoietin to control the production of red blood cells.
- Clean your blood**: Keep bones healthy. Remove many drugs that some people take for other conditions.

**What are the symptoms of kidney problems?**

- In the early stages of kidney disease there are often no symptoms.
- There may be few pain or discomfort in urine output. Kidney problems are found by a simple blood or urine test so we recommend that people at risk of CKD or AKI are tested regularly to spot problems as soon as possible.
- Symptoms of more serious kidney problems can include:  
• Tiredness • Frequent headaches • Loss of appetite • Sleep problems • Itchy skin • Nausea or vomiting • Swelling or numbness of the hands or feet • Passing urine more frequently at night or less often than usual • Darkening/lightening of the skin • Muscle cramps

**How to keep your kidneys healthy**

- Lead a healthy lifestyle
- Keep hydrated
- Don't smoke
- Keep your weight down
- Exercise regularly
- Eat a healthy diet including fresh fruit, vegetables and fish
- Reduce your intake of salt, processed foods and high sugar drinks

*If you take regular medication ask your pharmacist how it may affect your kidneys*

Kidney disease is serious. It's harmful and changes lives. Protect your kidneys as if your life depended on it: because it does! Find out how to keep your kidneys healthy and safe [www.thinkkidneys.nhs.uk](http://www.thinkkidneys.nhs.uk)

You can become a donor and help save a life by signing up at: [www.organdonation.nhs.uk](http://www.organdonation.nhs.uk)

Your kidneys are amazing. They work so hard for you. Look after them and Think Kidneys.

## Your patients, everyone else and AKI

We know from our research people generally don't know much about their kidneys – what they do and how to keep them healthy. Think Kidneys will be running a public campaign in the summer to help raise awareness for everyone – those at risk of AKI and everyone else who needs to know more.

If you'd like to be involved in the campaign in your practice, drop us an email at [thinkkidneys@renalregistry.nhs.uk](mailto:thinkkidneys@renalregistry.nhs.uk) and write 'campaign' in the message box, and we'll send you all the information and materials.