Ref: 17/1

Date issued: 10th March 2017

East Lancashire Hospitals **NHS**

NHS Trust

Blood Sciences Department, Clinical Laboratory Medicine

Acute Kidney Injury Alerts in Primary Care

Acute kidney injury (AKI) is a sudden reduction in renal function. The diagnosis and staging of AKI is based on acute changes in serum creatinine and/or a reduction in urine output which is known or presumed to have occurred within the prior 7 days (See Table 1). AKI is extremely common in hospitalised patients and is associated with poor outcomes. Primary Care has a crucial role in prevention and early detection of AKI in addition to post-AKI management. Up to 2/3 of patients with AKI have already developed it by the time of their hospital admission. The NHS England algorithm in Telepath computer system allows the automatic identification of *potential* cases of AKI in real time using the creatinine criteria shown in Table 1. The algorithm compares the current creatinine result on every patient to that patient's baseline creatinine (defined as the lowest creatinine in the previous 7 days (if available) and the median creatinine over the previous 8-365 days) and if applicable an AKI alert is reported alongside the creatinine result.

AKI Stage	Serum creatinine		Urine output
1	Rise of ≥1.5x baseline level or increase of >26 µmol/L within the previous 48h	OR	<0.5mL/kg/h for 6-12h
2	Rise of ≥2x baseline	OR	<0.5mL/kg/h for ≥12h
3	Rise of ≥3x baseline or a rise of ≥1.5 baseline to >354 µmol/L	OR	<0.3mL/kg/h for ≥24h or anuria for ≥12 h

Table 1: Definition of Acute Kidney Injury[1] (Note that in patients < 18 years, AKI stage 3 is also defined as a rise in serum creatinine to >3 x the upper limit of the age-related creatinine reference range. The urine output criteria also differ for children)

Responding to AKI alerts: The algorithm identifies potential cases of AKI. However, AKI is a clinical diagnosis and alerts must be interpreted in the clinical context and with previous results to confirm AKI. False positive alerts (e.g. post-partum) and false negative alerts (e.g. recurrent previous AKI) may be generated by the algorithm. A rise in creatinine may reflect progression of Chronic Kidney Disease rather than an acute change if the baseline creatinine results are from almost 12 months ago. Depending on clinical history, consider repeating creatinine within 48-72 hours to determine whether changes are dynamic or stable. It should also be noted that alerts cannot be triggered on patients that have not had a serum creatinine result in the previous 12 months. Guidance on the response to alerts in Primary Care has been provided by Think Kidneys and is displayed in Table 2.

Alert	Stable clinical context	Context of acute illness
AKI Stage 1	Consider clinical review ≤ 72 hours of alert to confirm/refute AKI	Consider clinical review ≤ 24 hours of alert. Likely AKI Stage 1
AKI Stage 2	Consider clinical review ≤ 24 hours of alert to confirm/refute AKI	Consider clinical review ≤ 6 hours of alert. Likely AKI Stage 2
AKI Stage 3	Consider clinical review ≤ 6 hours of alert. If AKI confirmed, consider admission	Consider immediate admission. Likely AKI Stage 3

Table 2: Recommended response times to AKI alerts for adults in Primary Care[2] Consider drugs that maybe harmful to kidneys, obstruction, hydration and infection. If there are AKI risk factors (e.g. poor oral intake/fluid output, hyperkalaemia, known CKD stages 4-5, past history of AKI, other comorbidities) consider earlier review.

Summary: From 3rd April 2017, the algorithm to trigger AKI alerts will look at all creatinine results on Primary Care patients. Alerts will be reported to ICE with the creatinine result if triggered and must be interpreted within the clinical context. For further information, please refer to the Think Kidneys website: Recognising and Responding to Acute Kidney Injury for Adults in Primary Care[2].

References:

1. KDIGO Clinical Practice Guideline for Acute Kidney Injury. Kidney International Supplements (2012) 2, 8–12

2. https://www.thinkkidneys.nhs.uk/aki/resources/primary-care/responding-aki-warning-stage-test-results-primary-care/

For further information or if you have any queries, please contact the Clinical Biochemists:

Dr Kathryn Brownbill (01254 734153, kathryn.brownbill@elht.nhs.uk)
Jane Armer (01254 735927, jane.armer@elht.nhs.uk)