UK Kidney Association

Transmitting AKI Warning Stage Data to the UK Renal Registry

Best Practice Guidance

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1. Background

Acute kidney injury (AKI), previously known as acute renal failure is an emerging global healthcare challenge. It is characterised by a sudden decline in kidney function and is rarely caused by physical injury or trauma to the kidneys. Acute kidney injury can occur without symptoms and is detected through a routine blood test. It has many different causes and usually occurs alongside other serious illnesses such as infection or dehydration and is common in patients in hospital. In some cases, certain medications can also affect the kidneys adversely and this can lead to acute kidney injury or add to the severity of acute kidney injury. Acute kidney injury is linked to an increased risk of death or prolonged illness as toxins and fluid collect in the body.

It is estimated that one in five emergency admissions into hospital are associated with acute kidney injury (Wang et al, 2012). Up to 100,000 deaths in hospitals are associated with acute kidney injury and a quarter to a third could potentially be prevented (National Confidential Enquiry into Patient Outcome and Death (NCEPOD) Adding Insult to Injury 2009). The National Institute for Health and Care Effectiveness (NICE) acute kidney injury guidance (published August 2013) highlights that the older person with complex health issues and associated illnesses is most at risk. The complication of acute kidney injury to ongoing illness prolongs hospital stays and increases mortality even when the severity of acute kidney injury seems mild. The long term outcomes of acute kidney injury are especially poor for people in this situation. The financial burden upon the NHS is large. NHS Kidney Care estimated that the cost to the NHS per annum is £500 million.

'Think Kidneys' is a national programme led by NHS England in partnership with the UK Renal Registry (UKRR). The main aim of the Programme Board is to ensure avoidable harm related to acute kidney injury is prevented in all healthcare settings.

2. Patient Safety Alert

The Think Kidneys detection workstream developed a national algorithm, standardising the definition of acute kidney injury. This was issued as an NHS England Patient Safety Alert in June 2014. NHS England AKI Patient Safety Alert recommended that the algorithm be implemented across the NHS. When integrated into a Laboratory Information Management System (LIMS) the algorithm identifies potential cases of acute kidney injury from laboratory data in real time and produces a test result. The laboratory system then sends the test result, using existing IT connections to patient management systems.

The installation of the NHS England acute kidney injury detection algorithm should be regarded as one part of a trust wide approach to tackling acute kidney injury. The installation of the algorithm is primarily the role of laboratory staff but other elements of the pathway require a multispecialty approach, including appropriate clinical engagement and senior executive buy in.

The nationally agreed algorithm provides the ability to ensure that a timely and consistent approach to the detection and diagnosis of patients with acute kidney injury is taken across the NHS. One of the requirements stipulated in the NHS England patient safety alert from June 2014 was to set up processes to extract AKI Warning Stage data and send them to the UKRR. The aim of this is to facilitate benchmarking and quality improvement for the condition. This document supports the AKI Warning Algorithm Best Practice Guidance publication, which can be found here: https://ukkidney.org/sites/renal.org/files/AKI_Warning_Algorithm.pdf

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3. How to transmit data to the UK Renal Registry

The NHS England patient safety alert requires that a report of the data is produced and transmitted electronically to the UKRR for patients with an AKI Warning Stage Result.

The AKI detection algorithm will produce a test result for every creatinine result that is consistent with a positive result for AKI; the test result is named 'AKI Warning Stage'. The test result will be a numerical field containing one of the three possible stages of AKI (1,2 or 3). These should be sent to your local results reporting system/patient management system and set to flag as abnormal, as for all other biochemical test results. In addition some laboratory systems may produce a null value which is not reported.

We are aware that some LIMS may have difficulty in extracting elements of the required data so we are asking for two files – a file of AKI Warning Stage data which we expect every system to be able to supply and an additional file with the creatinine result data for these patients. Laboratories with modern LIMS systems should have been able to supply both of these files to the UKRR by the March 2015 deadline; less modern systems will have to work towards being able to submit the second file in the future. Please note, the need to submit RV1 and RV2 data (as used by the AKI algorithm to calculate the AKI Warning Stage Result) has been dropped.

Please note that for any single index creatinine, there may be two available baselines; the latest previous creatinine (if one is available within 7 days of the index value) and a median based on more than one serum creatinine within the previous year. The algorithm is intended to instruct the LIMS to calculate both RV1 and RV2 and to select the higher value for checking against the threshold value of 1.5.

Sites should send one submission per month containing the data for the previous full calendar month (1 - 31st) based on Date Processed. The files should be submitted to the UKRR before the end of the following month. Sites should start sending from the first full month that the Alert has been running.

All Alerts / Results should be reported including those where fields such as the Source of Request are not known. Alerts should be counted whether or not they are being forwarded outside the LIMS (such as Primary Care at some sites).

If a site is only able to supply local patient identifiers but not NHS numbers or sufficient demographics to allow the number to be traced, you should expect that the UKRR will contact you periodically to request an extract from your PAS to supply this information.

Files should be submitted as ASCII CSV files. Fields should be supplied in the order given in the specification. No header row should be submitted. Any fields in the specifications which do not exist in the source data should be present but blank. No Line Feeds / Carriage Return characters should be present in any field. If commas are present in fields they should be quoted. If this is not possible we can accept other delimiters if notified.

String	ASCII String
Number	an Integer
Date	DD/MM/YYYY
Datetime	DD/MM/YYYY HH:MM:SS

There is an appreciation that there will be some variation in the format of data produced by the various LIMS and the UKRR will try to accommodate this as part of the import logic.

Any 'quirks' of your LIMS output that could affect the interpretation of the data should be described in an email to ukrr.akiregistry@nhs.net including the ODS lab code of the submitting system. Please do not include any patient identifiable data in your initial email.

The "Alert" File

Filename:
Format: LABCODE_YYYYMMDD_YYYYMMDD_ALERTS.csv
(Where the 1st date is the start of the period and the 2nd the end inclusive) Example:
69120_20140301_20140331_ALERTS.csv

Criteria:
One row should be included in the file for every alert that is generated within the period of the report. It is possible that there will be more than one row per patient in the files.

Data Item	Data	Notes
NHS Number	String	
Local Patient Identifier	String	If NHS Number not available
Forename	String	
Surname	String	
Sex	M/F/U	
DOB	Date	
Address 1	String	
Address 2	String	
Address 3 (Town)	String	
Address 4 (County)	String	
Post Code	String	
Lab Code *	String	ODS Code of Processing Lab
Specimen Number	String	
Source of Request	String	ODS Code if possible or text
Inpatient/Outpatient/Community Care Indicator Field	IP/OP/COM	If the system cannot distinguish between Outpatient and Community (Inc. GP) requests they should be coded as OP.
Date/Time of Alert Triggering Sample	Datetime	Date used in the AKI Algorithm
AKI Warning Stage Test Result	1/2/3	
Serum Creatinine Result (umol/l)	Decimal	The result associated with the alert
eGFR by MDRD Result	Decimal	The result associated with the alert
eGFR by CKD EPI Result	Decimal	If being used in place of eGFR by MDRD

* Laboratory ODS codes can be found at https://digital.nhs.uk/organisation-data-service/data-downloads/miscellaneous. If your site is not present or your details are not correct please contact NHS Digital at enquiries@nhsdigital.nhs.uk

The "Creatinine" File(s) – pre- and post-alert creatinine values

Filename:
Format: LABCODE_YYYYMMDD_YYYYMMDD_CREATININES.csv
(Where the 1st date is the start of the period and the 2nd the end inclusive) Example:
69120_20140301_20140331_CREATININES.csv

Criteria:
Serum Creatinine results should be included in this table where:
1. Pre-alert creatinine values
An AKI Alert has been recorded for the patient within the report period and the creatinine result (based on processing date) occurred less than 15 months prior to the date the alert was generated.

Or

2. Post-alert creatinine values
The creatinine result (based on processing date) occurred within the report period and the patient has had an AKI alert generated 15 months or less prior to the processing date of the test.

Each result should only appear once in the file even if it meets multiple criteria for inclusion.

Data Item	Data Format	Notes
NHS Number	String	
Local Patient Identifier	String	If NHS Number not available
Lab Code	String	ODS Code of Processing Lab
Specimen Number	String	
Source of Request	String	ODS code if available or text
Inpatient/Outpatient/Community Care Indicator Field	IP/OP/COM	If the system cannot distinguish between Outpatient and Community (Inc. GP) requests they should be coded as OP.
Collection Date	Datetime	If known
Processing Date	Datetime	
Serum Creatinine Result (umol/l)	Decimal	
eGFR by MDRD Result	Decimal	The result associated with the creatinine
eGFR by CKD EPI Result	Decimal	If being used in place of eGFR by MDRD

Email

The files should be compressed as a Zip file if possible and sent from an NHS.Net email account to ukrr.akiregistry@nhs.net.

If you do not have an NHS.Net email account you will need to encrypt the files with PGP before sending them. Please contact the AKI data team at ukrr.akiregistry@nhs.net for further information.

SFTP

We also offer the ability to upload using SFTP. Please email ukrr.akiregistry@nhs.net to discuss setting up access.

4. Reporting

A dashboard is published at https://ukkidney.org/audit-research/data-portals and updated monthly to show which sites have submitted data. The dashboard is colour coded and shows where data has been received that is incomplete or which we have not yet been able to load.

5. Information governance

The Health Research Authority has granted the UKRR exemption from section 251 of the NHS Act 2006 for the purpose of collecting data relating to acute kidney injury. This allows the UKRR to hold personal identifiable data without individual patient consent for the longitudinal follow up of cases and linkage to other healthcare databases.

6. Where to go for help

Acute Kidney Injury resources, information and advice available at the website: https://www.ukkidney.org

For any further information, please contact at the AKI data team at ukrr.akiregistry@nhs.net.

7. Acknowledgements

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