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## Replication of Acute Kidney Injury e-Alerts

Davies, G<sup>1\*</sup>, Scale, T<sup>2</sup>, Akbari, A<sup>1</sup>, Chess, J<sup>2</sup>, and Lyons, R<sup>1</sup>

<sup>1</sup>Swansea University

<sup>2</sup>NHS

### Background

Acute Kidney Injury (AKI) is a serious condition occurring in approximately 20% of emergency hospital admissions. A Welsh AKI e-Alert (electronic alerts) system was introduced from 2013 with the aim of improving patient outcomes through early recognition of AKI.

### Objectives

Our objective is to replicate the AKI e-Alert system which has been implemented throughout Wales and create a retrospective AKI cohort to facilitate data linkage.

### Methods

The e-alert algorithm was re-produced in SQL (Structured Query Language) and applied to serum creatinine (SCr) values 2011-2014 held in the Secure Anonymised Information Linkage (SAIL) Databank. The algorithm utilises ratios between current SCr value (C1) to lowest SCr value within the previous 7 days (RV1), SCr median values from the previous 8-365 days (RV2), and lowest SCr within 48hrs (D). >50% increase in RV1 or RV2 or >26µmol/L above D triggers an alert. We created a temporal AKI cohort by using a renal dataset to exclude patients undergoing chronic dialysis.

### Findings

2,407,590 SCr tests were performed on adult patients with 2,077,493 of these coming from people in Abertawe Bro Morgannwg University Health Board who were not on dialysis at the time of the test. The average population for 2011-2014 was 520,293. 85,272 (4.1%) of these tests triggered alerts for AKI. The average incidence of AKI per 100,000 population per year for 2011-2014 was 1,717. The average first AKI episodes per year for 2011-2014 respectively were stage 1 (least severe): 79.2%; stage 2: 13.5%; stage 3 (most severe): 7.3%.

### Conclusions

The e-alert can be effectively reproduced using SQL to identify AKI in this large dataset, enabling subsequent validation of these alerts and evaluation of their impact through multi-source data linkage.

\*Corresponding Author:

Email Address: [g.i.davies@swansea.ac.uk](mailto:g.i.davies@swansea.ac.uk) (G Davies)

