**Introduction** AKI is commonly defined using KDIGO criteria, including Serum creatinine (SCr) and urine output. Urine output has been suggested as a sensitive marker of AKI: use of urine output as well as SCr may increase incidence of AKI by up to 50% (Koeze et al, BMC nephrology, 2017). There is no consensus on whether urine output should be measured using consecutive hourly readings or mean output over fixed time periods. The method used may affect incidence of AKI and sensitivity/specificity of urine output as a diagnostic test. Previous studies of urine output as a marker of AKI have focused on critical care rather than groups with a timed causative event such as cardiac surgery.

**Aims** We aimed to determine whether using urine output to identify AKI led to increased incidence in cardiac surgery and ICU, and whether there was a significant difference between mean vs consecutive hours of oliguria.

**Methods** We conducted an observational study of patients undergoing cardiac surgery or admitted to ICU. Urine output was measured hourly and SCr was recorded daily for 5 days. AKI was staged using KDIGO SCr criteria alone. We then staged AKI using urine output in addition to SCr. We compared 2 methods of measurement: hourly urine output where each consecutive hour met KDIGO criteria (method 1) and mean hourly urine output (method 2). We then classified AKI using urine output alone and calculated sensitivity/specificity using SCr as gold standard.

**Results** Data from 150 ICU admissions and 151 cardiac surgeries were analysed. Patients were 68% male, mean age 62 +/- 16.Incidence of AKI using SCr was 24% in cardiac surgery and 32% in ICU. In cardiac surgery incidence of AKI increased by 16% using method 1 + SCr, and 49% using method 2 + SCr (table 1.). In ICU the incidence of AKI increased by 25% using method 1 + SCr or 37% using method 2 + SCr. Method 1 led to more diagnosis of stage 1 AKI but method 2 led to increased stage 2 AKI in both groups.

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| **Table 1. Incidence of AKI by stage using SCr +/- mean or consecutive hourly urine output** | | | | | | |
|  | SCr alone | | Consecutive hours urine output (method 1) + SCr | | Mean urine output (method 2) + SCr | |
|  | Cardiac Surgery | ICU | Cardiac Surgery | ICU | Cardiac Surgery | ICU |
| Stage 1 | 16% | 15% | 30% | 28% | 31% | 19% |
| Stage 2 | 2% | 7% | 3% | 13% | 36% | 37% |
| Stage 3 | 6% | 10% | 6% | 16% | 6% | 13% |

When AKI was classified using urine output alone and compared to classification by SCr, method 1 had good specificity in both groups but poorer sensitivity (table 2.). Method 2 had higher sensitivity (83%) in cardiac surgery but poor specificity (36%) and in ICU both sensitivity and specificity were poor.

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| **Table 2. Comparison of methods of defining hourly urine output for predicting SCr rise** | | | | |
|  | Consecutive hourly urine output (method 1) | | Mean urine output (method 2) | |
|  | Cardiac surgery | ICU | Cardiac surgery | ICU |
| Sensitivity | 61% | 58% | 83% | 67% |
| Specificity | 79% | 73% | 36% | 45% |

**Conclusion** Using urine output as well as SCr to define AKI increases the incidence of AKI in ICU and cardiac surgical settings. Using mean vs consecutive hours urine output increases sensitivity but has very poor specificity for predicting SCr rise. Mean urine output probably overestimates the incidence of AKI. A standardised method of defining hourly urine output is would reduce variability in incidence in AKI and would allow more accuracy in studies of AKI in medical literature.