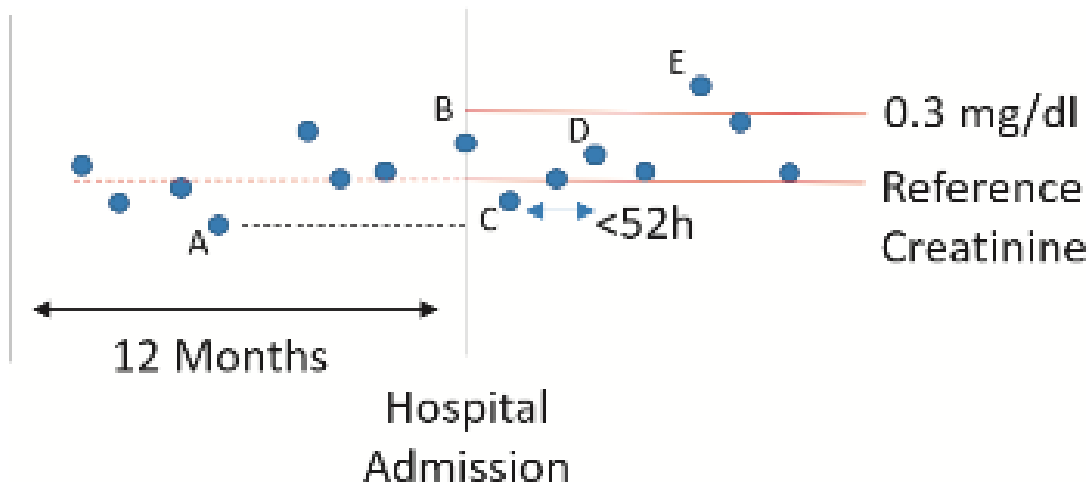


Figure S1. Graphic illustration of AKI surveillance system. Serum creatinine values are shown as circles. The baseline serum creatinine was previously determined as the lowest value over the preceding 12 months (A). In the new system, the median value is used for the baseline (dashed red line). When a baseline is available, it automatically becomes the reference creatinine (solid red line). Admission creatinine (B) is 50% greater than baseline value (A) and hence would have been counted as AKI, whereas in the new system B is not 50% increased from the new reference creatinine. Similarly, value D is 0.3 mg/dl greater than value C and these two values are within 52hrs so in the previous system this would be flagged as AKI. However, since value D is not 0.3 mg/dl greater than the reference value it would not be flagged in the new system. However, value E is both greater than the preceding value (also within 52h) and the reference by 0.3 mg/dl so this value would be flagged as AKI in both the previous and new systems.



Item S1. Additional Methods

Calculation of Sensitivity and Specificity of the AKI alert:

The sensitivity of the alert was calculated as a proportion of patients with the AKI alert among those with AKI. For this analysis, we first defined AKI as having an ICD-10 code for AKI (N19, N140, N170-172, N178-179, N990, O904, O0332, O0382, O0482, O0732, O084, R944, S37009A, T3995XA). Conversely, the specificity of the alert was then computed as the proportion of patients without an AKI alert among those with no ICD-10 code for AKI. However, because billing codes themselves are known to have limited accuracy, we also used clinical adjudication as a gold standard. We randomly audited charts such that each 100 of them should fit in one of the four categories - an active AKI alert with ICD-10 code for AKI, an active AKI alert without the ICD-10 code for AKI, no AKI alert with ICD-10 code for AKI and no AKI alert without ICD-10 code for AKI. The adjudication was performed by two authors, Drs. Kellum and Bataineh. Each case was reviewed by both adjudicators and any conflicts were resolved by discussion. The sensitivity and specificity of the alert was also calculated from these by adjusting for the proportion of patients in each category compared to the overall sample. Analyses were generated using Stata version 15.0 (College Station, TX).

Patient Protections

This was an approved, ongoing quality improvement project. IRB oversight was waived in accordance with institutional policy; informed consent was not obtained.

Development of Weighted Tables (Table 2)

To develop the weighted table for new alert we first tabulated the patients into 4 groups based on presence/absence of alert and presence of AKI (by ICD-10 code) as below:

	AKI code	No AKI code
Alert	39,494	30,539
No alert	15,615	251,732

Table a: Tabulation of patients into 4 groups based on presence/absence of alert and presence of AKI by ICD-10 code

We then calculated the percentage of patients in each cell as the percentage of total population (337,380) as below:

	AKI code	No AKI code
Alert	11.7%	9.1%
No alert	4.6%	74.6%

Table b: Percentage of the 4 groups based on presence/absence of alert and presence of AKI by ICD-10 code

We then developed the weighted table by calculating each cell based on the % of clinically adjudicated AKI (or lack thereof) in each cell and the percentage of population in each cell (from table above) as adjusted to the 400 charts reviewed as below –

The upper right cell with +Alert/-clinically adjudicated AKI was calculated as the percentage of patients in Table b that did not have clinically adjudicated AKI. As 68 patients out of 100 charts reviewed in this group did not have clinically adjudicated AKI, this translates into $(68\% \text{ of } 9.1\%) * 400 = (0.68 * 0.091) * 400 = 0.062 * 400 = 24.8$ (rounded off to 25).

The lower left cell with -Alert/+clinically adjudicated AKI was calculated as percentage of patients in Table b that had clinically adjudicated AKI. As 0 out of 100 patients in this group had clinically adjudicated AKI, this translates into $(0\% \text{ of } 4.6\%) * 400 = (0 * 0.046) * 400 = 0 * 400 = 0$.

The upper left cell with +Alert/+clinically adjudicated AKI was calculated as percentage of patients in Table b who had both clinically adjudicated AKI and positive alert. All 100 out of 100 charts that were with + alert and +ICD-10 code for AKI also had clinically adjudicated AKI. Additionally, there were 32 out of 100 charts with + alert but without AKI code who were judged to have clinically adjudicated AKI as above. Therefore the number was calculated as $([100\% \text{ of } 11.7\%] + [32\% \text{ of } 9.1\%]) * 400 = ([1.0 * 0.117] + [0.32 * 0.091]) * 400 = 0.146 * 400 = 58.4$ (rounded off to 58).

The lower right cell with -Alert/-clinically adjudicated AKI was calculated as percentage of patients in Table b that did not have clinically adjudicated AKI. All 100 out of 100 charts that were with – alert and – ICD-10 code for AKI did not have clinically adjudicated AKI. Additionally, all 100 charts reviewed with – alert but + ICD-10 code for AKI also were judged to not have clinically adjudicated AKI. Therefore this number was calculated as $([100\% \text{ of } 4.6\%] + [100\% \text{ of } 74.6\%]) * 400 = ([1 * 0.046] + [1 * 0.746]) * 400 = 0.792 * 400 = 316.8$ (rounded off to 317).

This gives us the adjusted table as below –

New alert weighted table –

	Clinically Adjudicated Gold Standard		Total
	AKI	Not AKI	
Positive Alert	58	25	83
Negative Alert	0	317	317
Total	58	342	400

This also translates into an unweighted table amongst the 400 charts reviewed as below –

New alert unweighted table –

	Clinically Adjudicated Gold Standard		Total
	AKI	Not AKI	
Positive Alert	132	68	200
Negative Alert	0	200	200
Total	132	268	400