

# Regional Health System Deployment of Clinical Decision Support for Detection of Acute Kidney Injury: Effects on Hospital Survival and Length of Stay

## ***Supplementary Appendix***

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**Supplementary Table 1:** Kidney Disease Improving Global Outcomes (KDIGO) Acute Kidney Injury Classification

Stage	Serum creatinine	Urine Output
1	≥1.5 times baseline OR 0.3mg/dl increase	< 0.5ml/kg/hr for ≥ 6hrs
2	≥2 times baseline	< 0.5ml/kg/hr for ≥ 12hrs
3	≥3 times baseline OR increase in creatinine to ≥ 4.0 mg/dl  In patients <18 yrs decrease of eGFR to less than 35 ml/min/1.73m <sup>2</sup>	< 0.3ml/kg/hr for ≥ 24hrs OR Anuria for ≥ 12hrs

Source: Kidney Disease: Improving Global Outcomes (KDIGO) Clinical Practice Guideline for Acute Kidney Injury. *Kidney inter, Suppl* 2012; 2 : 1–138. 2012

**Supplementary Table 2: Sensitivity Analysis: Medical and Surgical Unit data specific outcomes**

Medical Patients (N=341,179)

<b>Mortality</b>				
	Pre, n (%)	Post, n (%)	OR	p
No AKI	1882 (1.9%)	3323 (1.7%)	0.738 [0.661-0.825]	<0.001
AKI	1525 (10.1%)	3045 (9.0%)*	0.563 [0.480-0.660]	<0.001
AKI / pre-post interaction			0.793 [0.723-0.869]	<0.001
<b>Length of stay</b>				
	Pre, mean ± SD	Post, mean ± SD	IRR	p
No AKI	5.4±9.5	5.4±9.7	0.966 [0.940-0.992]	0.01
AKI	7.2±6.9	7.1±7.1*	0.908 [0.863-0.954]	<0.001
AKI / pre-post interaction			0.952 [0.929-0.975]	<0.001

Surgical Patients (N= 186,460)

<b>Mortality</b>				
	Pre, n (%)	Post, n (%)	OR	p
No AKI	467 (0.8%)	913 (0.8%)	0.553 [0.447-0.683]	<0.001
AKI	519 (10.7%)	1129 (10.6%)	0.715 [0.539-0.949]	0.02
AKI / pre-post interaction			0.676 [0.569-0.804]	<0.001
<b>Length of stay</b>				
	Pre, mean ± SD	Post, mean ± SD	IRR	p
No AKI	5.0±6.5	5.0±6.2	0.800 [0.781-0.818]	<0.001
AKI	16.0±18.4	15.2±15.8*	0.803 [0.723-0.892]	<0.001
AKI / pre-post interaction			0.772 [0.739-0.808]	<0.001

Shown are unadjusted results from mortality and length of stay stratified by medical vs. surgical patients. \*P<0.05 for unadjusted comparison between Pre- and Post-. Covariate adjusted odds ratios (OR), incidence rate ratios (IRR), and interactions are also shown with corresponding p-values. AKI, acute kidney injury; SD, standard deviation.

**Supplementary Table 3:** Covariate-adjusted mortality and length of stay after removing one hospital at a time

**Mortality**

Hospital removed	OR	SE	p	Lower 95% CI	Upper 95% CI
1	0.760	0.036	<.001	0.692	0.835
2	0.762	0.032	<.001	0.702	0.827
3	0.764	0.032	<.001	0.703	0.830
4	0.792	0.035	<.001	0.726	0.864
5	0.759	0.032	<.001	0.700	0.824
6	0.760	0.032	<.001	0.700	0.824
7	0.769	0.032	<.001	0.709	0.834
8	0.763	0.032	<.001	0.702	0.830
9	0.758	0.033	<.001	0.696	0.826
10	0.761	0.032	<.001	0.701	0.826
11	0.757	0.034	<.001	0.694	0.826
12	0.762	0.035	<.001	0.698	0.833
13	0.743	0.032	<.001	0.683	0.808
14	0.763	0.031	<.001	0.704	0.827
<b>Length of stay</b>					
Hospital removed	IRR	SE	p	Lower 95% CI	Upper 95% CI
1	0.918	0.007	<.001	0.904	0.933
2	0.907	0.007	<.001	0.894	0.920
3	0.910	0.007	<.001	0.897	0.923
4	0.907	0.007	<.001	0.893	0.921
5	0.906	0.007	<.001	0.893	0.920
6	0.906	0.007	<.001	0.893	0.919
7	0.912	0.007	<.001	0.899	0.926
8	0.907	0.007	<.001	0.894	0.921
9	0.906	0.007	<.001	0.892	0.920
10	0.907	0.007	<.001	0.894	0.920
11	0.908	0.007	<.001	0.895	0.922
12	0.902	0.007	<.001	0.888	0.916
13	0.907	0.007	<.001	0.894	0.921
14	0.900	0.006	<.001	0.888	0.912

OR, odds ratio; IRR, incidence rate ratios; SE, standard error; CI, confidence interval.

**Supplementary Table 4:** Effect of CDSS on hospital length of stay and mortality by age, severity of illness, and medical versus surgical admissions.

Length of Stay

	IRR	p	LCI	UCI	p*
Age≥60	0.896	<.001	0.873	0.919	0.974
Age<60	0.853	<.001	0.809	0.898	
Charlson index >0	0.890	<.001	0.868	0.912	0.286
Charlson index = 0	0.879	0.002	0.810	0.954	
Surgical	0.772	<.001	0.739	0.808	0.023
Medical	0.952	<.001	0.929	0.975	

Mortality

	OR	p	LCI	UCI	p*
Age≥60	0.745	<.001	0.681	0.816	0.005
Age<60	0.870	0.131	0.726	1.043	
Charlson index >0	0.798	<.001	0.734	0.867	0.888
Charlson index = 0	0.629	0.002	0.472	0.838	
Surgical	0.676	<.001	0.569	0.804	0.127
Medical	0.793	<.001	0.723	0.869	

\*p-value for the interaction between strata; CDSS: clinical decision support system; IRR: incidence rate ratio; OR: odds ratio; LCI: lower confidence interval; UCI: upper confidence interval.