

## Supplemental Digital Content 4: Independent Preoperative Predictors of Acute Kidney Injury from the Derivation

### Cohort of 70,929 Patients: Multivariable Logistic Regression Full Model †

Risk Factor	$\beta$ Coefficient	Adjusted Odds Ratio / (95% Confidence Interval)
<b>Medical Factors</b>		
Patient Age (years) <sup>§</sup>	0.0000134	1.00 (0.99-1.00)
BMI (kg/m <sup>2</sup> ) <sup>§§</sup>	0.178	1.19 (1.15-1.24)
Male Gender	0.306	1.36 (1.28-1.44)
<b>Patient Medical History *</b>		
Liver Disease	0.464	1.59 (1.45-1.74)
Coagulopathy	0.403	1.50 (1.36-1.64)
Hypertension, Complicated	0.553	1.74 (1.58-1.91)
Diabetes, Complicated	0.411	1.51 (1.30-1.76)
Weight Loss	0.185	1.20 (1.10-1.31)
Pulmonary Circulation Disorders	0.147	1.16 (1.04-1.29)
AIDS/HIV	0.461	1.59 (0.94-2.67)
Congestive Heart Failure	0.046	1.05 (0.95-1.15)
Cardiac Arrhythmias	0.081	1.08 (1.01-1.17)
Peripheral Vascular Disorders	0.059	1.06 (0.98-1.15)
Chronic Pulmonary Disease	0.004	1.00 (0.93-1.08)
Hypertension, Uncomplicated	0.007	1.01 (0.94-1.07)
Diabetes, Uncomplicated	0.060	1.06 (0.99-1.14)
Lymphoma	0.125	1.13 (0.93-1.38)
Paralysis/Other Neurological Disorders	0.103	1.11 (1.01-1.22)
Metastatic Cancer	0.008	1.01 (0.91-1.12)
Psychoses	-0.076	0.93 (0.73-1.18)
Valvular Disease	-0.024	0.98 (0.88-1.09)
Drug Abuse	-0.039	0.97 (0.82-1.16)
Rheumatoid Arthritis / Collagen Vascular Diseases	-0.060	0.94 (0.82-1.09)
Peptic Ulcer Disease Excluding Bleeding	0.032	1.03 (0.85-1.25)
Solid Tumor	-0.016	0.98 (0.90-1.07)
Hypothyroidism	-0.080	0.92 (0.84-1.01)
Alcohol Abuse	-0.154	0.86 (0.75-0.99)
<b>Preoperative Chronic Medications</b>		
ACEI/ARB	0.028	1.03 (0.95-1.12)
Beta Blocker	-0.022	0.98 (0.91-1.05)
Hemoglobin, g/dL <sup>§</sup>	-0.006	0.99 (0.99-0.99)
Preoperative eGFR (mL/min/1.73 m <sup>2</sup> ) <sup>§</sup>	-0.00002	0.99 (0.99-0.99)
Preinduction Baseline Mean Arterial Pressure (mmHg) <sup>§</sup>	0.000009	1.00 (1.00-1.00)
<b>Surgical Factors</b>		
<b>Surgical Body Region</b>		
Elevated Risk (all regions except below)	0.857	2.36 (2.14-2.60)
Low Risk (ENT, upper extremity, spine)		(reference)
Emergent Surgery	0.350	1.42 (1.29-1.56)
<b>Anesthetic Factors</b>		
<b>ASA Class</b>		
ASA Class 1		(reference)
ASA Class 2	0.056	1.06 (0.83-1.35)
ASA Class 3	0.730	2.08 (1.63-2.64)
ASA Class 4	1.132	3.10 (2.42-3.98)
ASA Class 5	1.876	6.52 (4.43-9.61)
Expected Anesthesia Duration (Hours) <sup>§§§</sup>	1.208	3.35 (2.95-3.80)
General Anesthesia	0.308	1.36 (1.24-1.49)
<b>Institutional Factors</b>		
Non-university Hospital	-0.062	0.94 (0.66-1.34)
Institution (Random Effect), ICC (95% CI)		0.21 (0.11-0.38)
<b>C-statistic (95% CI)</b>		
		0.75 (0.74-0.76)
<b>Preoperative Risk Quartiles</b>		
	Number of Cases, n(%)	Observed AKI Proportion (%)
Quartile 1 (Low Risk)	17,733 (25)	2.0
Quartile 2 (Medium Risk)	17,732 (25)	4.3
Quartile 3 (High Risk)	17,732 (25)	8.2
Quartile 4 (Highest Risk)	17,732 (25)	19.8

† Mixed effects model with anonymized institution ID as random effect; all other covariates fixed effects.

§ Squared transformation

§§ Square root transformation

§§§ Logarithmic transformation

\*As determined by Elixhauser Comorbidity Enhanced ICD-9-CM/ICD-10 CM Algorithm

AKI = acute kidney injury; ASA = American Society of Anesthesiologists; AIDS = autoimmune deficiency syndrome; CI = confidence interval; CKD = chronic kidney disease; CKD-EPI = Chronic Kidney Disease Epidemiology Collaboration; CPT = Current Procedural Terminology; eGFR = estimated glomerular filtration rate; ENT = ear/nose/throat; HIV = human immunodeficiency virus; ICC = intraclass correlation coefficient; KDIGO = Kidney Disease: Improving Global Outcomes; WHO = World Health Organization