Supplemental Digital Content 15A: Subgroup Analysis: Multivariable Analysis of Preoperative Characteristics and Postoperative Acute Kidney Injury – Logistic Regression Full Model[†] Performed on Derivation Cohort Among High Risk Surgical Cases [‡]

Risk Factor	β Coefficient	Multivariable model p-value	Adjusted Odds Ratio (95% Confidence Interval) [†]
Medical Factors			
Patient Age (years)[§]	0.00007	<0.002	1.00 (1.00-1.00)
BMI (kg/m²)[§§]	0.274	<0.001	1.32 (1.24-1.40)
Male Gender	0.482	<0.001	1.62 (1.47-1.78)
Patient Medical History [*]			
Congestive Heart Failure	-0.050	0.564	0.95 (0.80-1.13)
Cardiac Arrhythmias	0.191	0.002	1.21 (1.07-1.37)
Valvular Disease	0.114	0.243	1.12 (0.93-1.36)
Pulmonary Circulation Disorders	0.166	0.097	1.18 (0.97–1.44)
Peripheral Vascular Disorders	0.125	0.045	1.13 (1.00-1.28)
Hypertension, Uncomplicated	0.049	0.361	1.05 (0.95-1.17)
Hypertension, Complicated	0.491	<0.001	1.63 (1.38-1.93)
Paralysis/Other Neurological Disorders	-0.061	0.513	0.94 (0.78-1.13)
Chronic Pulmonary Disease	0.079	0.173	1.08 (0.97-1.21)
Diabetes, Uncomplicated	0.036	0.548	1.04 (0.92-1.17)
Diabetes, Complicated	0.410	0.007	1.51 (1.12-2.03)
Hypothyroidism	-0.182	0.018	0.83 (0.72-0.97)
Liver Disease	0.590	<0.001	1.80 (1.57-2.08)
Peptic Ulcer Disease Excluding Bleeding	-0.091	0.568	0.91 (0.67-1.25)
AIDS/HIV	0.824	0.079	2.28 (0.91-5.71)
Rheumatoid Arthritis / Collagen Vascular Diseases	-0.091	0.459	0.91 (0.71-1.16)
Coagulopathy	0.454	<0.001	1.58 (1.34-1.85)
Lymphoma	0.011	0.951	1.01 (0.72-1.43)
Metastatic Cancer	0.026	0.715	1.03 (0.89-1.18)
Solid Tumor	0.192	0.002	1.21 (1.08-1.37)
Weight Loss	0.328	<0.001	1.39 (1.21-1.59)
Alcohol Abuse	0.100	0.406	1.10 (0.87-1.40)
Drug Abuse	-0.102	0.521	0.90 (0.66-1.23)
Psychoses	0.086	0.690	1.09 (0.71-1.66)
Preoperative Chronic Medications			
ACEI/ARB	-0.016	0.807	0.98 (0.86-1.12)
Beta Blocker	0.055	0.376	1.06 (0.93-1.20)
Preoperative hemoglobin (g/dL) [§]	-0.006	<0.001	0.99 (0.99-0.99)
Preoperative eGFR (mL/min/1.73 m²) [**][§]	-0.00004	<0.001	1.00 (1.00-1.00)
Preinduction Baseline Mean Arterial Pressure (mmHg) [§]	0.000005	0.489	1.00 (1.00-1.00)
Surgical Factors			
Emergent Surgery	0.411	<0.001	1.51 (1.31-1.74)
Anesthetic Factors			
ASA Class			
ASA Class 1	0	(reference)	
ASA Class 2	-0.108	0.572	0.90 (0.62-1.31)
ASA Class 3	0.370	0.050	1.45 (1.00-2.09)
ASA Class 4	0.776	<0.001	2.17 (1.48-3.19)
ASA Class 5	1.633	<0.001	5.12 (3.02-8.68)
Expected Anesthesia Duration[§§§]	2.053	<0.001	7.79 (6.18-9.82)
General Anesthesia	0.291	0.285	1.34 (0.78-2.28)
Institutional Factors			
Non-university Hospital (Fixed Effect)	0.262	0.282	1.30 (0.81-2.09)
Institution (Random Effect), ICC (95% CI)			0.26 (0.14-0.47)
Original Model performance (c-statistic)			0.75 (0.74-0.76)
New Model performance (c-statistic)			0.76 (0.75-0.77)

[‡] Defined as intraperitoneal, intrathoracic, and suprainguinal vascular procedures.
[†] Mixed effects model with anonymized institution ID as random effect; all other covariates fixed effects.
[*] *As determined by Elixhauser Comorbidity Enhanced ICD-9-CM/ICD-10 CM Algorithm*

Supplemental Digital Content 15B: Subgroup Analysis: Risk of Acute Kidney Injury Associated with

Intraoperative Hypotension by Preoperative Risk Quartile – High Risk Cases[‡]

Absolute Hypotension - Derivation Cohort				
Intraoperative Hypotension[†] - Absolute MAP Values	Quartile 1[*] Low Preoperative Risk (N = 6,525)	Quartile 2[*] Medium Preoperative Risk (N = 6,524)	Quartile 3[*] High Preoperative Risk (N = 6,524)	Quartile 4[*] Highest Preoperative Risk (N = 6,524)
No Absolute Hypotension	(reference) n = 3,933	(reference) n = 3,687	(reference) n = 3,449	(reference) n = 2,705
MAP 60-64 mmHg	1.18 (0.78-1.76) n = 1,391	1.15 (0.85-1.57) n = 1,482	1.25 (1.01-1.54) **Increased AKI** n = 1,567	0.98 (0.84-1.14) n = 1,702
MAP 55-59 mmHg	0.91 (0.52-1.60) n = 797	1.44 (1.03-2.01) **Increased AKI** n = 953	1.23 (0.96-1.57) n = 1,002	1.35 (1.15-1.57) **Increased AKI** n = 1,287
MAP 50-54 mmHg	1.81 (0.93-3.55) n = 274	1.37 (0.78-2.41) n = 277	2.05 (1.47-2.86) **Increased AKI** n = 322	1.61 (1.30-1.98) **Increased AKI** n = 515
MAP <50 mmHg	1.13 (0.35-3.63) n = 130	2.73 (1.47-5.08) **Increased AKI** n = 125	1.88 (1.22-2.90) **Increased AKI** n = 184	2.00 (1.56-2.57) **Increased AKI** n = 315

Relative Hypotension - Derivation Cohort				
Intraoperative Hypotension[†] – Relative MAP Values	Quartile 1[*] Low Preoperative Risk (N = 6,525)	Quartile 2[*] Medium Preoperative Risk (N = 6,524)	Quartile 3[*] High Preoperative Risk (N = 6,524)	Quartile 4[*] Highest Preoperative Risk (N = 6,524)
No Relative Hypotension	(reference) n = 1,993	(reference) n = 1,678	(reference) n = 1,595	(reference) n = 1,762
MAP 20-30% Below Baseline	1.21 (0.77-1.89) n = 1,835	1.11 (0.78-1.58) n = 1,727	0.85 (0.66-1.09) n = 1,618	0.81 (0.68-0.95) **Decreased AKI** n = 1,552
MAP 30-40% Below Baseline	1.40 (0.89-2.19) n = 1,750	1.35 (0.97-1.90) n = 1,873	1.09 (0.86-1.38) n = 1,932	0.82 (0.70-0.97) **Decreased AKI** n = 1,686
MAP > 40% Below Baseline	1.88 (1.15-3.09) **Increased AKI** n = 947	1.69 (1.18-2.41) **Increased AKI** n = 1,246	1.29 (1.01-1.66) **Increased AKI** n = 1,379	1.00 (0.85-1.18) n = 1,524

Adjusted Odds Ratio – Color Scale[†]

1.00	
1.20	
1.40	
1.60	
1.80	
2.00	
2.20	
2.40	
2.60	
2.80	
3.00	

Values presented as adjusted odds ratio and 95% confidence interval.
‡Defined as intraperitoneal, intrathoracic, and suprainguinal vascular procedures.
[*] Patients were stratified by risk of postoperative AKI using the full multivariable model.
† Color scale used only for adjusted odds ratios demonstrating statistically significant associations.
Regression within each quartile included all four blood pressure ranges and operative duration (log transformed).
AKI = acute kidney injury; MAP = mean arterial pressure