Supplemental Digital Content 14A: Subgroup Analysis: Multivariable Analysis of Preoperative Characteristics and Postoperative Acute Kidney Injury – Logistic Regression Full Model[†] Performed on Derivation Cohort Among Cases with >20 Minutes of Invasive Arterial Line Blood Pressure Monitoring

Risk Factor	β Coefficient	Multivariable model p-value	Adjusted Odds Ratio (95% Confidence Interval) [†]
Medical Factors			
Patient Age (years)[§]	0.000013	0.410	1.00 (1.00-1.00)
BMI (kg/m²)[§§]	0.261	<0.001	1.30 (1.23-1.38)
Male Gender	0.339	<0.001	1.40 (1.28-1.54)
Patient Medical History [*]			
Congestive Heart Failure	0.018	0.795	1.02 (0.89-1.16)
Cardiac Arrhythmias	0.098	0.082	1.10 (0.99-1.23)
Valvular Disease	0.006	0.942	1.01 (0.86-1.17)
Pulmonary Circulation Disorders	0.128	0.128	1.14 (0.96–1.34)
Peripheral Vascular Disorders	-0.023	0.681	0.98 (0.88-1.09)
Hypertension, Uncomplicated	-0.018	0.720	0.98 (0.89-1.08)
Hypertension, Complicated	0.472	<0.001	1.60 (1.39-1.85)
Paralysis/Other Neurological Disorders	0.073	0.331	1.08 (0.93-1.24)
Chronic Pulmonary Disease	0.013	0.819	1.01 (0.91-1.13)
Diabetes, Uncomplicated	0.041	0.461	1.04 (0.93-1.16)
Diabetes, Complicated	0.342	0.007	1.41 (1.10-1.80)
Hypothyroidism	-0.172	0.016	0.84 (0.73-0.97)
Liver Disease	0.672	<0.001	1.96 (1.71-2.24)
Peptic Ulcer Disease Excluding Bleeding	-0.022	0.890	0.98 (0.72-1.33)
AIDS/HIV	0.734	0.121	2.08 (0.82-5.28)
Rheumatoid Arthritis / Collagen Vascular Diseases	0.107	0.336	1.11 (0.90-1.38)
Coagulopathy	0.471	<0.001	1.60 (1.40-1.83)
Lymphoma	0.003	0.985	1.00 (0.73-1.38)
Metastatic Cancer	-0.080	0.284	0.92 (0.80-1.07)
Solid Tumor	-0.095	0.125	0.91 (0.80-1.03)
Weight Loss	0.168	0.011	1.04 (1.09-1.35)
Alcohol Abuse	-0.283	0.011	0.75 (0.61-0.94)
Drug Abuse	-0.118	0.434	0.89 (0.66-1.19)
Psychoses	-0.015	0.939	0.98 (0.66-1.46)
Preoperative Chronic Medications			
ACEI/ARB	0.032	0.606	1.03 (0.92-1.16)
Beta Blocker	-0.018	0.753	0.98 (0.88-1.10)
Preoperative hemoglobin (g/dL) [§]	-0.005	<0.001	0.99 (0.99-0.99)
Preoperative eGFR (mL/min/1.73 m²) [**] [§]	-0.00004	<0.001	0.99 (0.99-0.99)
Preinduction Baseline Mean Arterial Pressure (mmHg) [§]	0.00001	0.735	1.00 (1.00-1.00)
Surgical Factors			
Surgical Body Region			
Elevated Risk	1.24	<0.001	3.46 (3.00-3.99)
Emergent Surgery	0.354	<0.001	1.43 (1.25-1.62)
Anesthetic Factors			
ASA Class			
ASA Class 1	0		(reference)
ASA Class 2	-0.036	0.885	0.96 (0.59-1.58)
ASA Class 3	0.472	0.053	1.60 (0.99-2.59)
ASA Class 4	0.083	<0.001	2.37 (1.46-3.85)
ASA Class 5	1.534	<0.001	4.64 (2.60-8.26)
Expected Anesthesia Duration[§§]	1.322	<0.001	3.75 (3.03-4.65)
General Anesthesia	0.295	<0.001	1.84 (1.23-1.47)
Institutional Factors			
Non-university Hospital (Fixed Effect)	-0.043	0.841	0.96 (0.63-1.45)
Institution (Random Effect), ICC (95% CI)			0.21 (0.11-0.39)
Original Model performance (c-statistic)			0.75 (0.74-0.76)
New Model performance (c-statistic)			0.76 (0.75-0.77)

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

Supplemental Digital Content 14B: Subgroup Analysis: Risk of Acute Kidney Injury Associated with Intraoperative Hypotension by Preoperative Risk Quartile – Cases with >20 Minutes of Invasive Arterial Line Blood Pressure Monitoring

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 |

Absolute Hypotension - Derivation Cohort				
Intraoperative Hypotension[†] - Absolute MAP Values	Quartile 1[*] Low Preoperative Risk (N = 6,061)	Quartile 2[*] Medium Preoperative Risk (N = 6,060)	Quartile 3[*] High Preoperative Risk (N = 6,060)	Quartile 4[*] Highest Preoperative Risk (N = 6,060)
No Absolute Hypotension	(reference) n = 3,089	(reference) n = 3,204	(reference) n = 3,086	(reference) n = 2,685
MAP 60-64 mmHg	1.03 (0.68-1.54) n = 1,616	1.26 (0.98-1.61) n = 1,493	0.95 (0.78-1.16) n = 1,507	1.19 (1.03-1.38) n = 1,498
MAP 55-59 mmHg	1.18 (0.72-1.93) n = 925	1.10 (0.80-1.50) n = 892	1.13 (0.90-1.42) n = 956	1.48 (1.26-1.73) **Increased AKI** n = 1,123
MAP 50-54 mmHg	1.49 (0.73-3.03) n = 313	0.82 (0.47-1.43) n = 298	1.44 (1.04-2.00) **Increased AKI** n = 320	1.73 (1.39-2.14) **Increased AKI** n = 460
MAP <50 mmHg	1.77 (0.63-4.98) n = 118	1.79 (1.06-3.02) **Increased AKI** n = 173	1.94 (1.33-2.83) **Increased AKI** n = 191	2.43 (1.89-3.13) **Increased AKI** n = 294
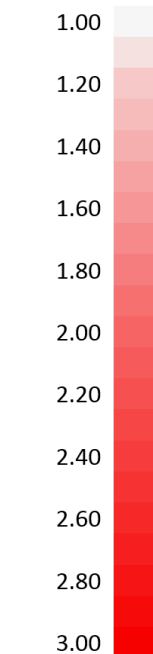
Relative Hypotension - Derivation Cohort				
Intraoperative Hypotension[†] – Relative MAP Values	Quartile 1[*] Low Preoperative Risk (N = 6,061)	Quartile 2[*] Medium Preoperative Risk (N = 6,060)	Quartile 3[*] High Preoperative Risk (N = 6,060)	Quartile 4[*] Highest Preoperative Risk (N = 6,060)
No Relative Hypotension	(reference) n = 1,355	(reference) n = 1,523	(reference) n = 1,558	(reference) n = 2,094
MAP 20-30% Below Baseline	1.17 (0.69-2.00) n = 1,476	0.98 (0.73-1.32) n = 1,471	0.88 (0.70-1.10) n = 1,553	0.81 (0.69-0.94) **Decreased AKI** n = 1,419
MAP 30-40% Below Baseline	1.54 (0.94-2.51) n = 1,863	1.04 (0.78-1.38) n = 1,746	1.00 (0.80-1.25) n = 1,641	0.83 (0.71-0.98) **Decreased AKI** n = 1,358
MAP > 40% Below Baseline	2.17 (1.32-3.57) **Increased AKI** n = 1,367	1.15 (0.85-1.56) n = 1,320	1.22 (0.97-1.53) **Increased AKI** n = 1,308	0.98 (0.83-1.16) n = 1,189

Values presented as adjusted odds ratio and 95% confidence interval.
[*] *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