

SUPPLEMENTAL TABLES

Supplemental Table 1. Baseline Characteristics of the Development Cohort ^a

Variable	Patients			P Value
	All Patients (N=3,816)	Without AKI (n=3,423)	Patients With Any AKI (n=393)	
Demographics				
Age, y	68 (53.0-81.1)	67 (52.1-80.8)	75 (60.8-84.7)	<.001
Men	1,705 (44.7)	1,501 (43.9)	204 (51.9)	.003
White	3,492 (91.5)	3,133 (91.5)	359 (91.4)	.98
Medical unit	2,345 (61.4)	2,034 (59.4)	311 (79.1)	<.001
Length of stay, d	3.9 (4.0)	3.6 (3.4)	6.4 (6.8)	<.001
No. of rehospitalizations in 1 year	1.4 (0.9)	1.4 (0.9)	1.7 (1.3)	<.001
BMI, kg/m ²	30 (8)	30 (8)	30 (9)	.80
Baseline kidney function				
Creatinine, mg/dL	1.0 (0.4)	1.0 (0.4)	1.3 (0.8)	<.001
Estimated GFR, mL/min/1.73 m ²	76.3 (27.2)	78.1 (26.5)	61.2 (28.4)	<.001
CKD 3 or worse	1,082 (28.4)	879 (25.7)	203 (51.7)	<.001
Comorbid conditions				
Charlson score (without age)	2.5 (3.0)	2.3 (2.9)	4.2 (3.6)	<.001
Charlson score (with age)	4.8 (3.8)	4.5 (3.7)	7.0 (4.2)	<.001
Coronary artery disease	311 (8.1)	262 (7.7)	49 (12.5)	.001
Heart failure	504 (13.2)	409 (11.9)	95 (24.2)	<.001
Peripheral vascular disease	847 (22.2)	705 (20.6)	142 (36.1)	<.001
Cerebrovascular disease	734 (19.2)	620 (18.1)	114 (29.0)	<.001

Dementia	97 (2.5)	86 (2.5)	11 (2.8)	.90
Chronic pulmonary disease	974 (25.5)	832 (24.3)	142 (36.1)	<.001
Rheumatic disease	98 (2.6)	87 (2.5)	11 (2.7)	.90
Peptic ulcer disease	207 (5.4)	176 (5.2)	31 (7.9)	.03
Mild liver disease	585 (15.3)	511 (14.9)	74 (18.8)	.05
Diabetes mellitus without complications	394 (10.3)	321 (9.3)	73 (18.6)	<.001
Diabetes mellitus with complications	380 (9.9)	291 (8.5)	89 (22.6)	<.001
Hemiplegia or paraplegia	182 (4.8)	156 (4.6)	26 (6.6)	.09
Renal disease	624 (16.4)	490 (14.3)	134 (34.1)	<.001
Cancer	556 (14.6)	477 (13.9)	79 (20.1)	.001
Moderate-severe liver disease	55 (1.4)	39 (1.3)	16 (4.1)	<.001
Metastatic cancer	192 (5.0)	158 (4.6)	34 (8.7)	<.001
HIV/AIDS	0 (0)	0 (0)	0 (0)	>.99
Hypertension, uncomplicated	2,381 (62.4)	2,069 (60.4)	312 (79.4)	<.001
Hypertension, complicated	497 (13.0)	382 (11.2)	115 (29.7)	<.001
Coagulopathy	384 (10.7)	321 (9.4)	63 (16.0)	<.001
Obesity	491 (12.9)	425 (12.4)	66 (16.8)	.02
Weight loss	469 (12.3)	408 (11.9)	61 (15.5)	.05
Fluid electrolyte disorders	1,347 (40.5)	1,137 (38.1)	210 (61.3)	<.001

Abbreviations: AIDS=acquired immunodeficiency syndrome; AKI=acute kidney injury; BMI=body mass index; CKD=chronic kidney disease; GFR=glomerular filtration rate; HIV=human immunodeficiency virus.

^a Values are median (interquartile range), No. of patients (%), or mean (SD).

Supplemental Table 2. ICD-9-CM Coding Algorithms for Charlson Scores and Comorbid Conditions

Comorbidities	Enhanced ICD-9-CM
Myocardial infarction	410.x, 412.x
Congestive heart failure	398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 425.4-425.9, 428.x
Peripheral vascular disease	093.0, 437.3, 440.x, 441.x, 443.1-443.9, 47.1, 557.1, 557.9, V43.4
Cerebrovascular disease	362.34, 430.x-438.x
Dementia	290.x, 294.1, 331.2
Chronic pulmonary disease	416.8, 416.9, 490.x-505.x, 506.4, 508.1, 508.8
Rheumatic disease	446.5, 710.0-710.4, 714.0-714.2, 714.8, 725.x
Peptic ulcer disease	531.x-534.x
Mild liver disease	070.22, 070.23, 070.32, 070.33, 070.44, 070.54, 070.6, 070.9, 570.x, 571.x, 573.3, 573.4, 573.8, 573.9, V42.7
Diabetes without chronic complication	250.0-250.3, 250.8, 250.9
Diabetes with chronic complication	250.4-250.7
Hemiplegia or paraplegia	334.1, 342.x, 343.x, 344.0-344.6, 344.9
Renal disease	403.01, 403.11, 403.91, 404.02, 404.03, 404.12, 404.13, 404.92, 404.93, 582.x,

	583.0-583.7, 585.x, 586.x, 588.0, V42.0, V45.1, V56.x
Any malignancy, including lymphoma and leukemia, except neoplasm of skin	140.x-172.x, 174.x-195.8, 200.x-208.x, 238.6
Moderate or severe liver disease	456.0-456.2, 572.2-572.8
Metastatic solid tumor	196.x-199.x
AIDS/HIV	042.x-044.x

Data from *Med Care*.²⁷

Supplemental Table 3. Comorbid Conditions Associated With Hospital-Acquired Acute Kidney Injury at Any Stage (Univariate Logistic Regression)

Feature	Coefficient ^a	Odds Ratio (95% CI)	P Value
Hypertension	0.97	2.65 (2.06-3.45)	<.001
Medical Unit	0.95	2.59 (2.02-3.35)	<.001
Renal Disease	0.95	2.58 (2.08-3.20)	<.001
Diabetes Mellitus	0.95	2.57 (2.00-3.28)	<.001
Heart Failure	0.85	2.35 (1.82-3.02)	<.001
Vascular Disease	0.80	2.23 (1.81-1.76)	<.001
Coagulopathy	0.61	1.84 (1.37-2.46)	<.001
Pulmonary Disease	0.57	1.76 (1.41-2.19)	<.001
Coronary Artery Disease	0.54	1.72 (1.23-2.36)	.001
Cancer	0.46	1.58 (1.22-2.04)	<.001
Obesity	0.35	1.42 (1.06-1.88)	.02
Male Gender	0.32	1.38 (1.12-1.70)	.002
Liver Disease	0.32	1.37 (1.04-1.78)	.02
Weight Loss	0.31	1.36 (1.00-1.80)	.04
Charlson Score (per 1- point increase)	0.17	1.18 (1.15-1.22)	<.001
Age (per 1-year increase)	0.02	1.02 (1.01-1.03)	<.001

^a Coefficient estimate for the model.

Supplemental Table 4. Table based on cutoffs for 80% sensitivity and specificity in the validation cohort

Score	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
Low (< -2.57)	0.24 (0.20, 0.29)	0.38 (0.36, 0.40)	0.05 (0.04, 0.06)	0.80 (0.78, 0.83)
Med (-2.57 to -1.94)	0.33 (0.28, 0.38)	0.74 (0.72, 0.75)	0.13 (0.11, 0.16)	0.90 (0.89, 0.91)
High (> -1.94)	0.43 (0.38, 0.48)	0.88 (0.87, 0.89)	0.31 (0.27, 0.35)	0.93 (0.92, 0.94)

Supplemental Table 5. Table based on cutoffs for 90% sensitivity and specificity in the validation cohort

Score	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
Low (< -2.93)	0.11 (0.10, 0.12)	0.64 (0.62, 0.66)	0.03 (0.02, 0.04)	0.85 (0.84, 0.87)
Med (-2.93 to -1.63)	0.61 (0.56, 0.66)	0.41 (0.39, 0.43)	0.11 (0.10, 0.13)	0.90 (0.88, 0.91)
High (>-1.63)	0.29 (0.25, 0.34)	0.95 (0.94, 0.96)	0.41 (0.35, 0.47)	0.92 (0.91, 0.93)

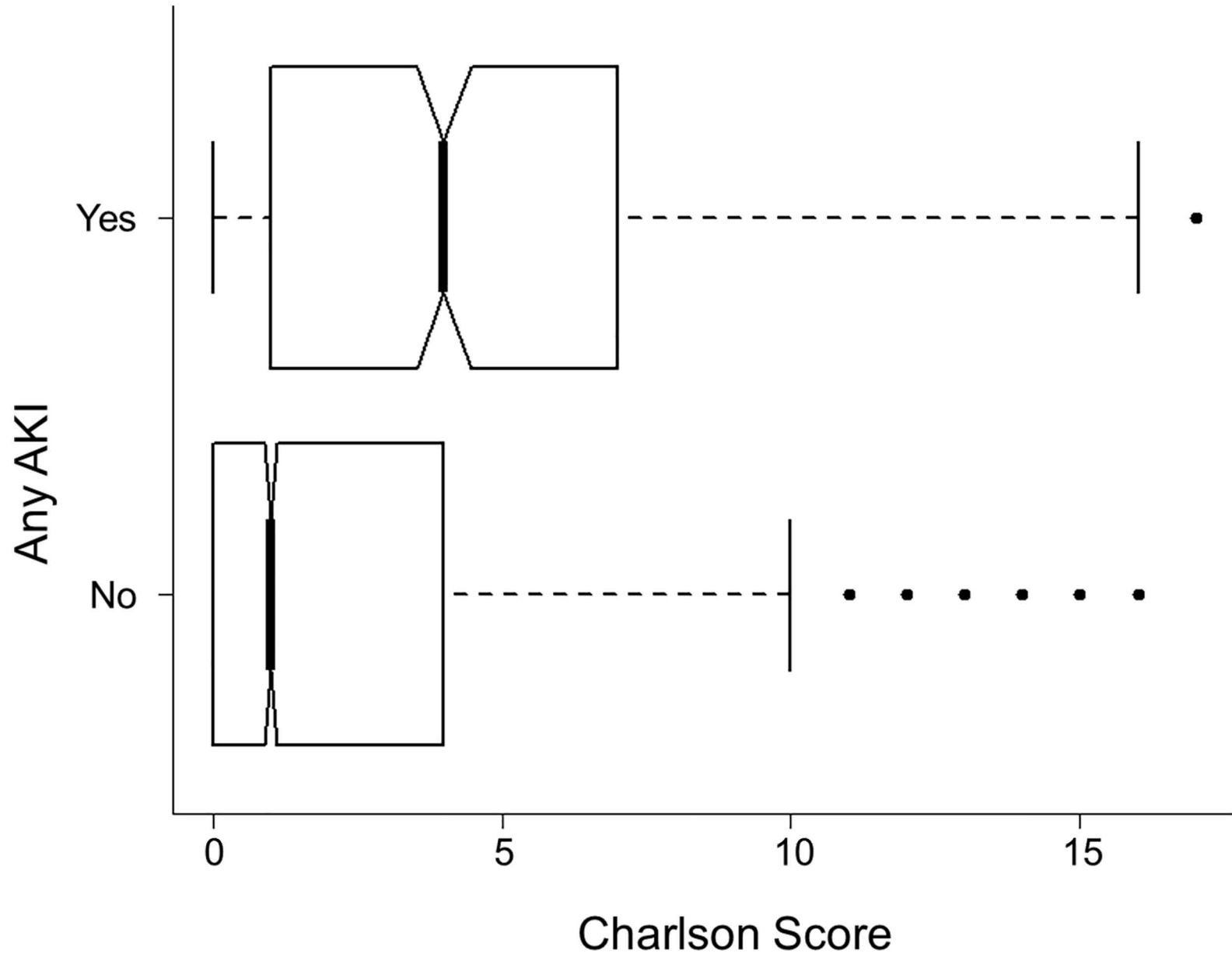
Supplemental Legends

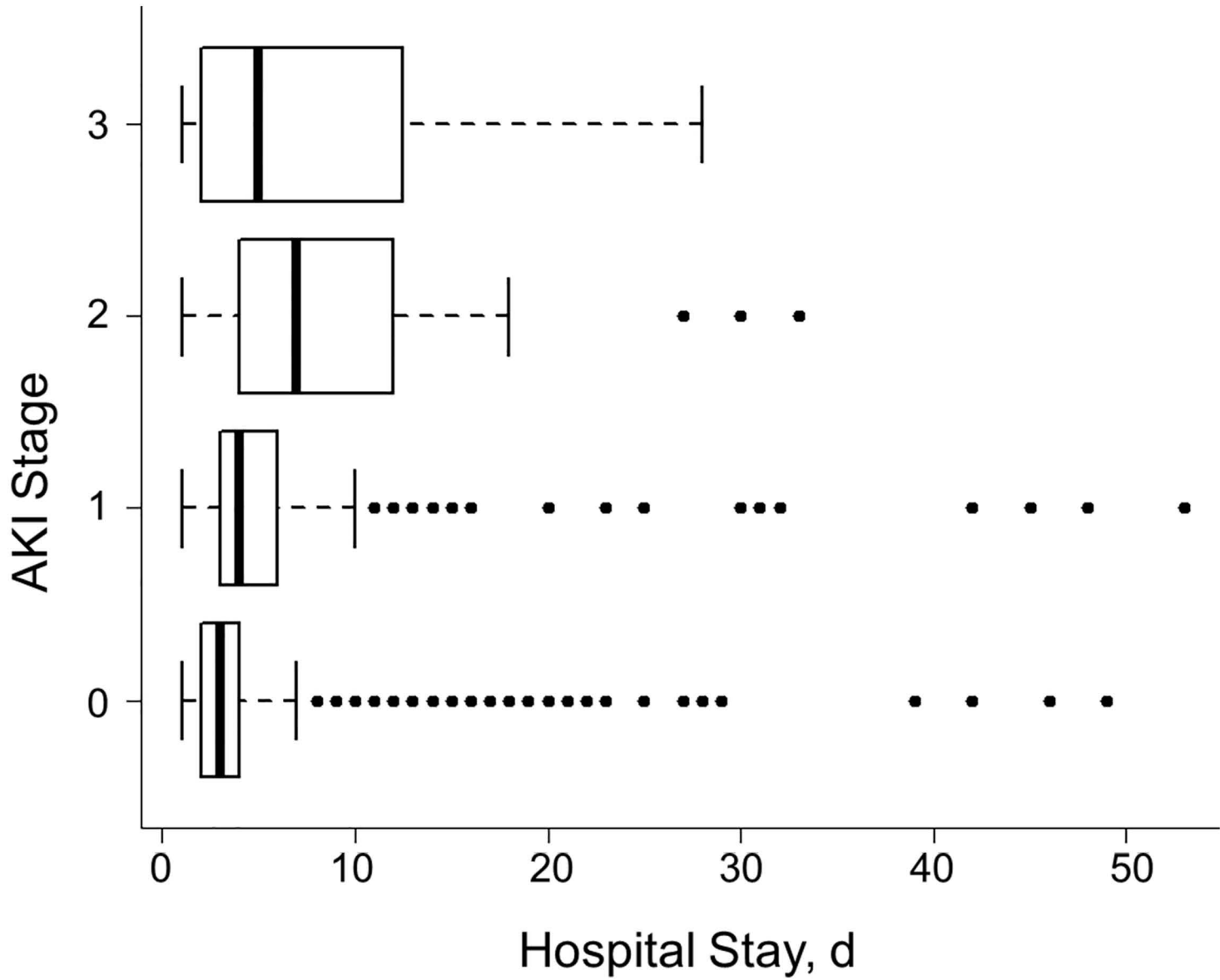
Supplemental Figure 1. Box Plots Showing Number of Baseline Comorbid Conditions (Charlson Score) by Presence or Absence of Any Hospital-Acquired Acute Kidney Injury (AKI) (Development Cohort). $P < .001$.

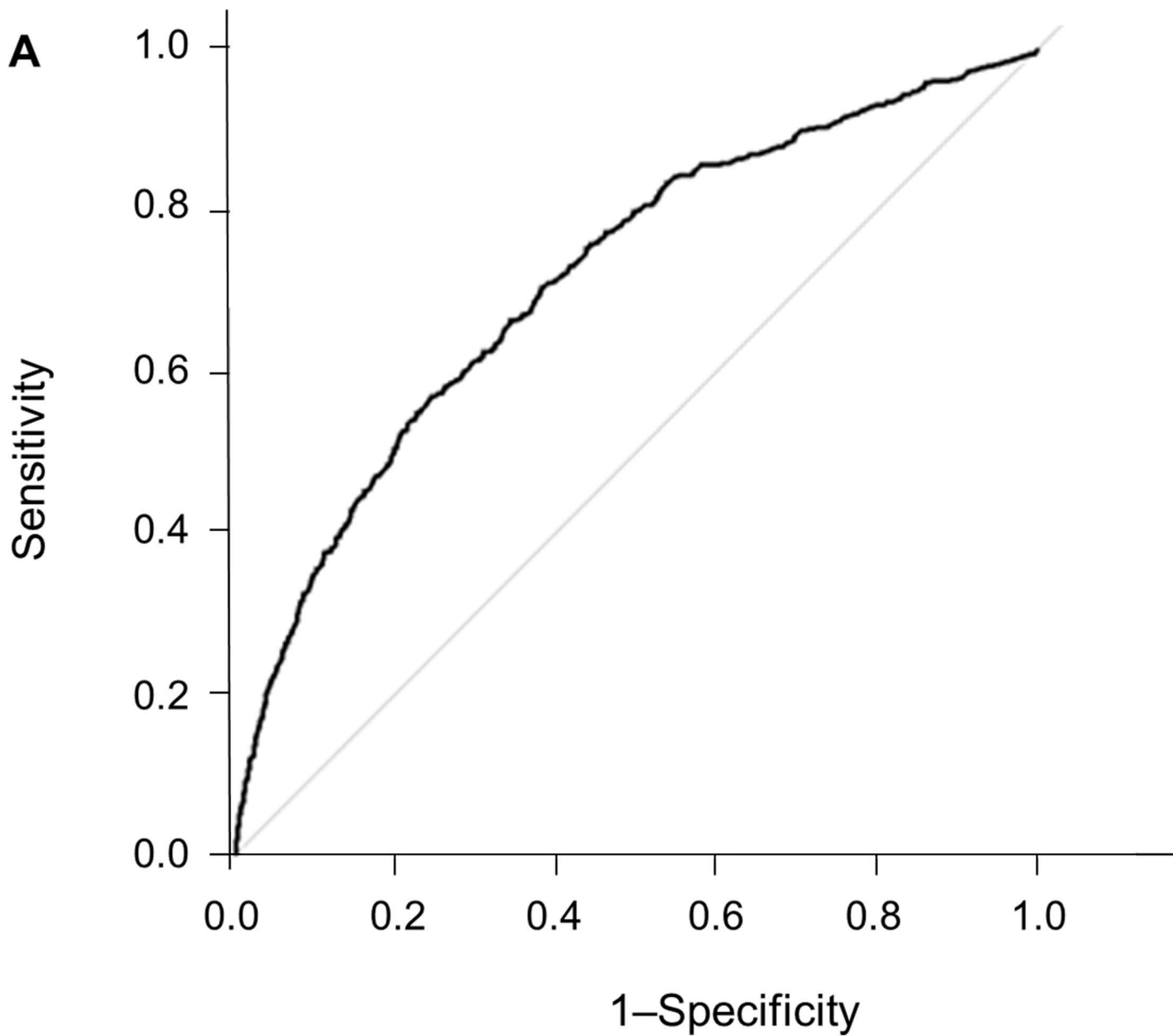
Supplemental Figure 2. Box Plots Showing Hospital Length of Stay by Acute Kidney Injury (AKI) Stage (Development Cohort). $P < .001$.

Supplemental Figure 3. Analysis of the Final Model (Development Cohort). A, Receiver operating characteristic curve. B, Calibration graph. Observed vs expected acute kidney injury.

Supplemental Figure 4. Analysis of the Final Model (Validation Cohort). A, Receiver operating characteristic curve. B, Calibration graph. Observed vs expected acute kidney injury.

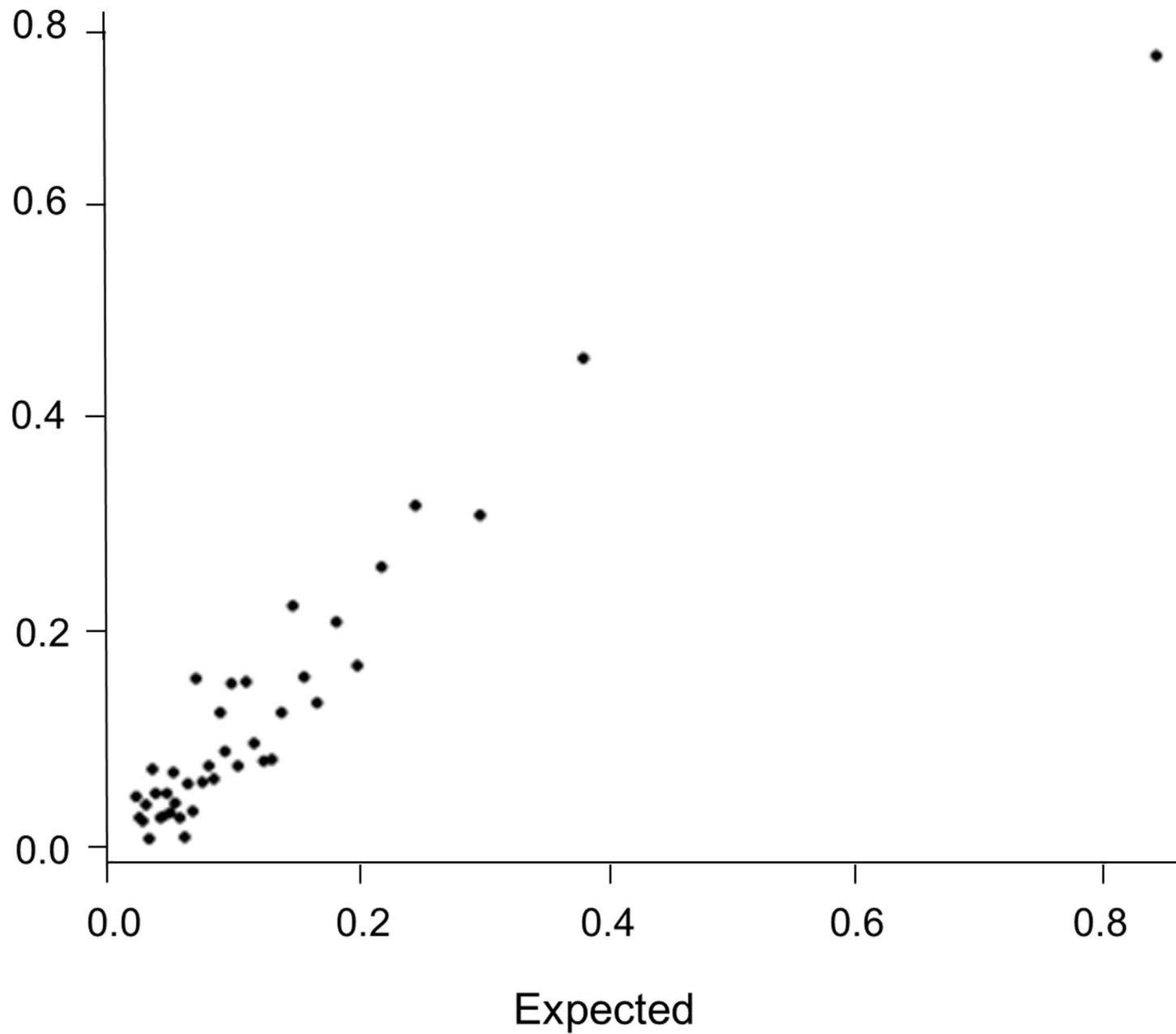




A

B

Observed



A

Sensitivity

