



Predicting Acute Kidney Injury in a Georgia Quality Improvement Program Trauma Cohort

1. Background

- GQIP is a collaboration of Georgia ACS TQIP hospitals
- GQIP AKI rates were higher than national benchmarks (figure 1)
- We aimed to develop an early AKI prediction model for trauma

2. Methods

- Retrospective cohort study of adult trauma admissions in 2016 & 2017 from 10 GA trauma centers
- Primary endpoints:
 - AKI within 14 days of presentation
 - CRRT
- Data split:
 - 70% Training Set
 - 30% Validation Set
- Predictive multivariable regression was trained and validated

3. Results

Table 1 Multivariable Log Regression on Early AKI

Variable	Crude OR (95% CI)	Multivariable OR (95% CI)
Age	1.02 (1.00, 1.03)	1.02 (1.01, 1.04)
Hypertension		
Yes	2.36 (1.36, 4.09)	1.87 (0.90, 3.90)
No	REF	REF
CHF		
Yes	3.35 (0.82, 13.7)	3.91 (0.80, 19.1)
No	REF	REF
Injury Severity Score	1.06 (1.04, 1.08)	1.06 (1.03, 1.08)
ED Systolic BP	0.99 (0.98, 1.00)	0.99 (0.98, 1.00)
Admission Cr	0.84 (0.72, 0.98)	0.79 (0.60, 1.02)

Figure 1 GA 2020 TQIP Report

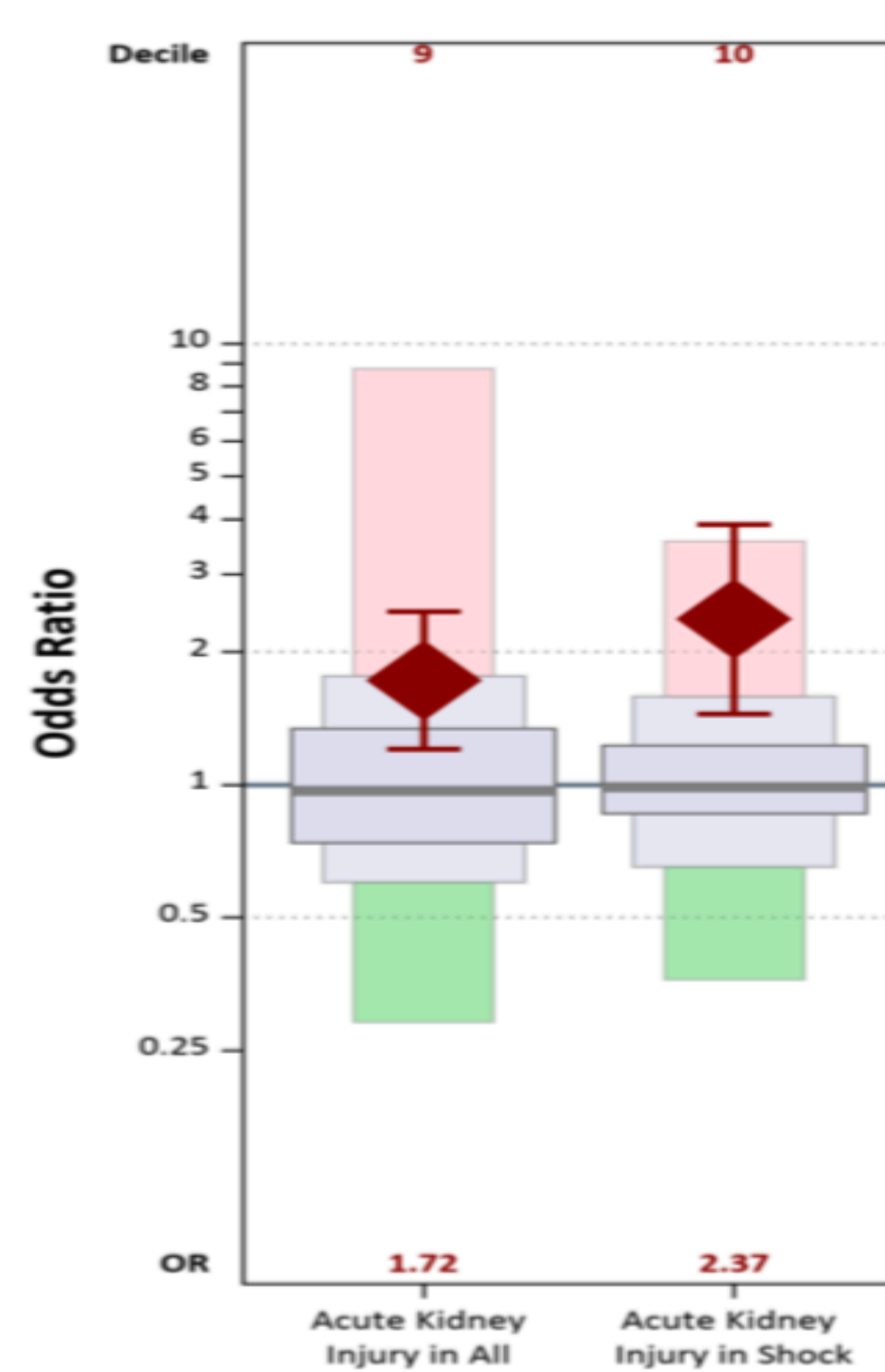


Table 2 Multivariable Log Regression on CRRT

Variable	Crude OR (95% CI)	Multivariable OR (95% CI)
Age	1.02 (1.00, 1.04)	1.00 (0.98, 1.03)
Sex		
Male	0.16 (0.04, 0.73)	11.3 (1.35, 94.7)
Female	REF	REF
Injury Severity Score	0.93 (0.91, 0.96)	1.05 (1.01, 1.08)
Blood Transfusion		
Yes	0.13 (0.05, 0.31)	3.70 (1.27, 10.8)
No	REF	REF
Admission Cr	0.90 (0.75, 1.09)	0.95 (0.75, 1.20)

Figure 2 Early AKI ROC Curves

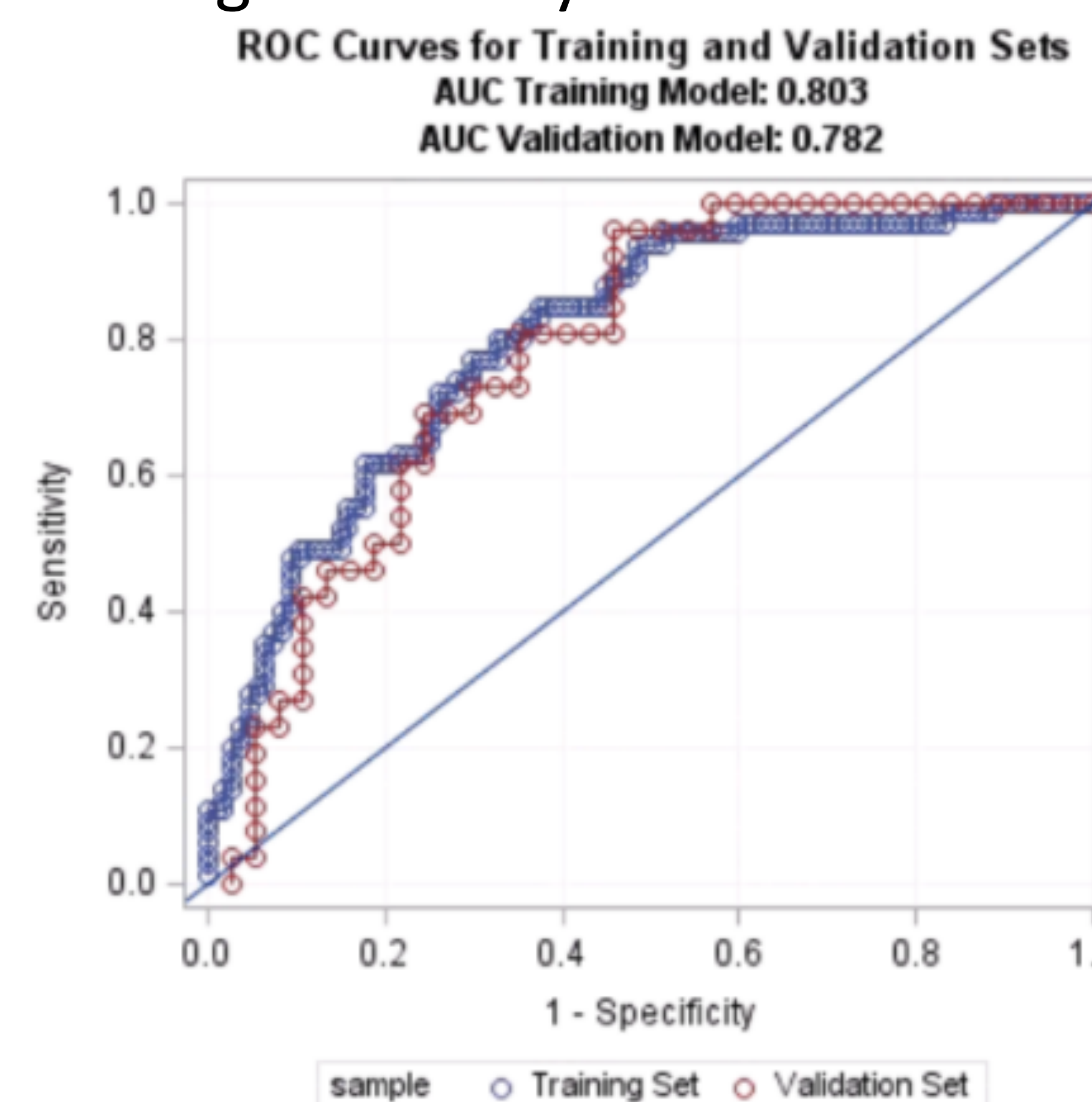
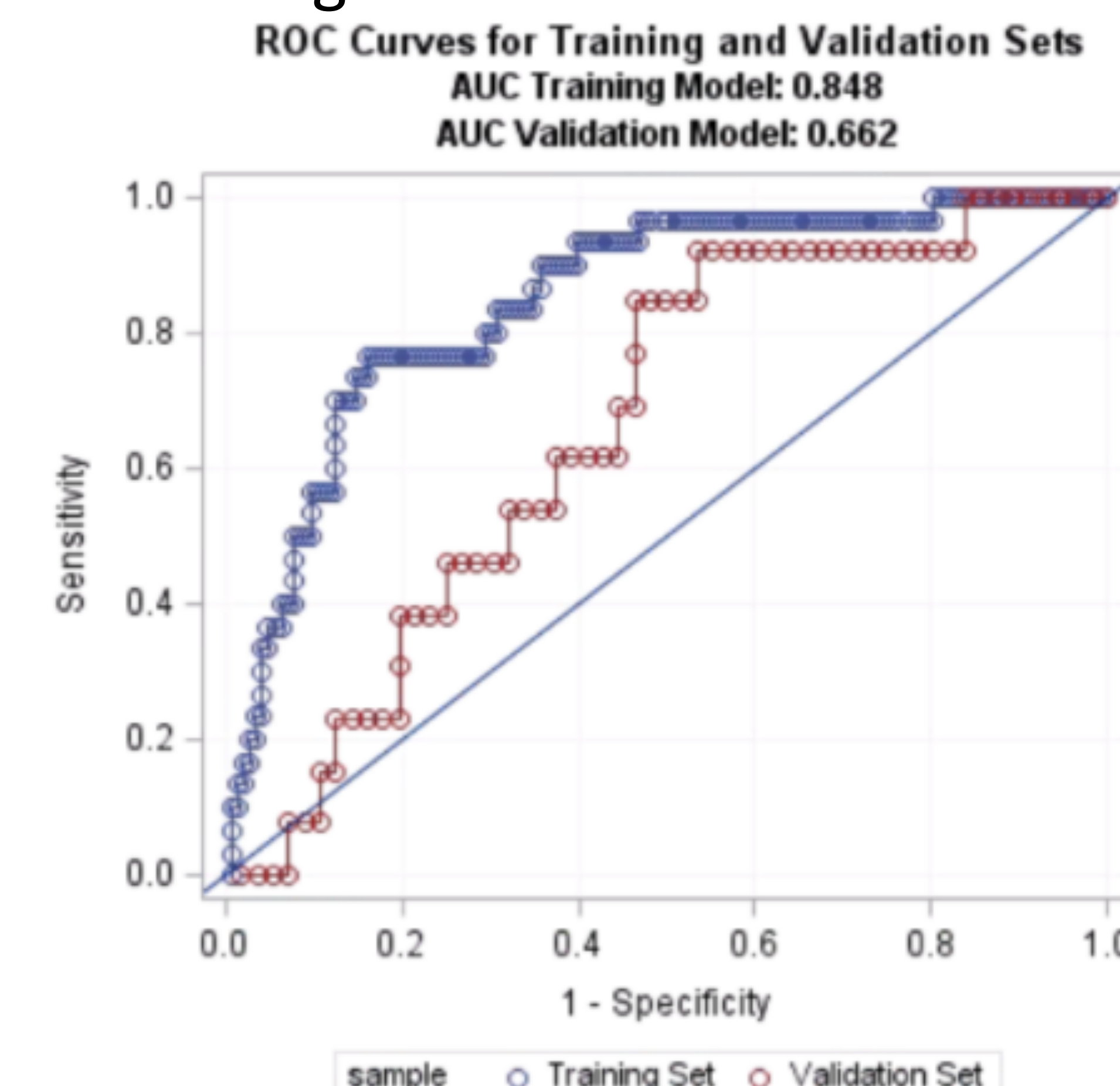


Figure 3 CRRT ROC Curves



4. Conclusion

- Final models show reasonable prediction (AUC-0.803 & AUC-0.848) for early AKI and CRRT in trauma admissions
- An AKI/CRRT prediction model using early trauma variables may be beneficial in AKI monitoring and protection

5. Future

- Collect prospective data to validate prediction models
- Build a tiered AKI protective bundle
- Implement AKI risk prediction tool and utilize AKI protective bundle for high risk patients

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