



## A Statewide Collaborative Drill Down and Analysis of Unplanned ICU Admissions



**1. BACKGROUND:** The Georgia Quality Improvement Program (GQIP) is a collaboration of hospitals in Georgia who participate in TQIP. Unplanned ICU admission was a consistent high outlier in GQIP reports over several years. We aimed to analyze our cohort of unplanned ICU admissions with a 10% or less TQIP calculated probability of ICU admission.

**2. METHODS:** Each center collected data on patients with a 10% or less probability of having an unplanned ICU readmission identified in their Fall 2019 TQIP report. Clinically relevant data were pulled from the trauma registry and the electronic medical record. Data validation was performed as centers confirmed a true unplanned ICU admit rather than a data collection error. The cohort was then stratified based on initial admission to the floor or ICU.

**3. FINDINGS:** Data was received from all 14 Level I & II centers for a total of 126 patients. 96 % were determined to be true Unplanned ICU admits consistent with NTDB. 61% were initially admitted to the floor and 39% were initially admitted to the ICU and required readmission. Initial ICU admissions had higher ISS scores and a higher rate of traumatic brain injury patients. The most common causes for unplanned ICU admission were respiratory (44%), neurogenic (21%) and cardiac (15%). Both groups had similar respiratory admissions while initial floor patients had a higher rate of cardiac issues and ICU readmissions had higher rates of neurogenic causes.

Table 1. Georgia TQIP Collaborative Report Table

Complication <sup>a</sup>	Cohort	Fall 2019	Spring 2020
Acute Kidney Injury	All Patients	1.47	1.71
Acute Kidney Injury	Shock	1.55	2.39
Ventilator-Associated Pneumonia	All Patients	1.51	1.58
Ventilator-Associated Pneumonia	Severe TBI	1.41	1.47
Pulmonary Embolism	All Patients	0.99	1.07
Surgical Site Infection	All Patients	1.09	1.32
Unplanned Admission to the ICU	All Patients	1.35	1.40
Unplanned Return to OR	All Patients	0.83	1.11
Catheter-Associated UTI	All Patients	1.20	1.35

Table 2. Baseline and Hospital Variables Between Initial Floor Admissions and Initial ICU admissions

Variables	All (N=126)	Initial Admission: ICU (N=49)	Initial Admission: Floor (N=77)	P-Value
Age	57 (36-74)	56.3 (31-77)	59 (47-74)	0.405
ISS	16 (10-20)	17 (14-25)	14 (9.5-17)	<.001
Admit Service				
Trauma	101 (82.1%)	43 (93.5%)	58 (75.3%)	0.014
Other	22 (17.9%)	3 (6.5%)	19 (24.6%)	
Injury Type				
Blunt	112 (91.1%)	41 (89.1%)	71 (92.2%)	0.521
Penetrating	10 (8.1%)	5 (10.9%)	5 (6.5%)	
TBI Diagnosis	36 (29.5%)	20 (43.5%)	16 (21.1%)	0.011
ED Disposition				
Floor	60 (48.8%)	0	60 (77.9%)	--
ICU	38 (30.9%)	38 (82.6%)	0	
OR	16 (13.0%)	8 (17.4%)	8 (10.4%)	
Stepdown	9 (7.3%)	0	9 (11.7%)	
Probability of Event	2% (1.6%-3%)	3% (2%-4%)	2% (1.5%-2.8%)	<.001
OR Procedure				
Yes	64 (50.8%)	24 (49.0%)	40 (52.0%)	0.745
No	62 (49.2%)	25 (51.0%)	37 (48.1%)	
Reason for ICU Admission				
Respiratory	54 (43.9%)	21 (45.7%)	33 (42.9%)	0.207
Cardiac	18 (14.6%)	2 (4.3%)	16 (20.8%)	
Neuro	26 (21.1%)	14 (30.4%)	12 (15.6%)	
Bleeding	9 (7.3%)	3 (6.5%)	6 (7.8%)	
Other	16 (13.0%)	6 (13.0%)	10 (13.0%)	
Hospital Day of ICU Admission	3 (2-6)	7 (4-7)	2 (2-4)	<.001
Hospital LOS	14 (9-22)	18 (10-32)	12 (8-17.5)	<.001

Categorical Variables: N (%), Continuous Variables: Median (IQR) Abbreviations: ISS – Injury Severity Score. TBI – Traumatic Brain Injury; ED – Emergency Department, OR – Operating Room, LOS – Length of Stay

Figure 1. Initial Admission Location

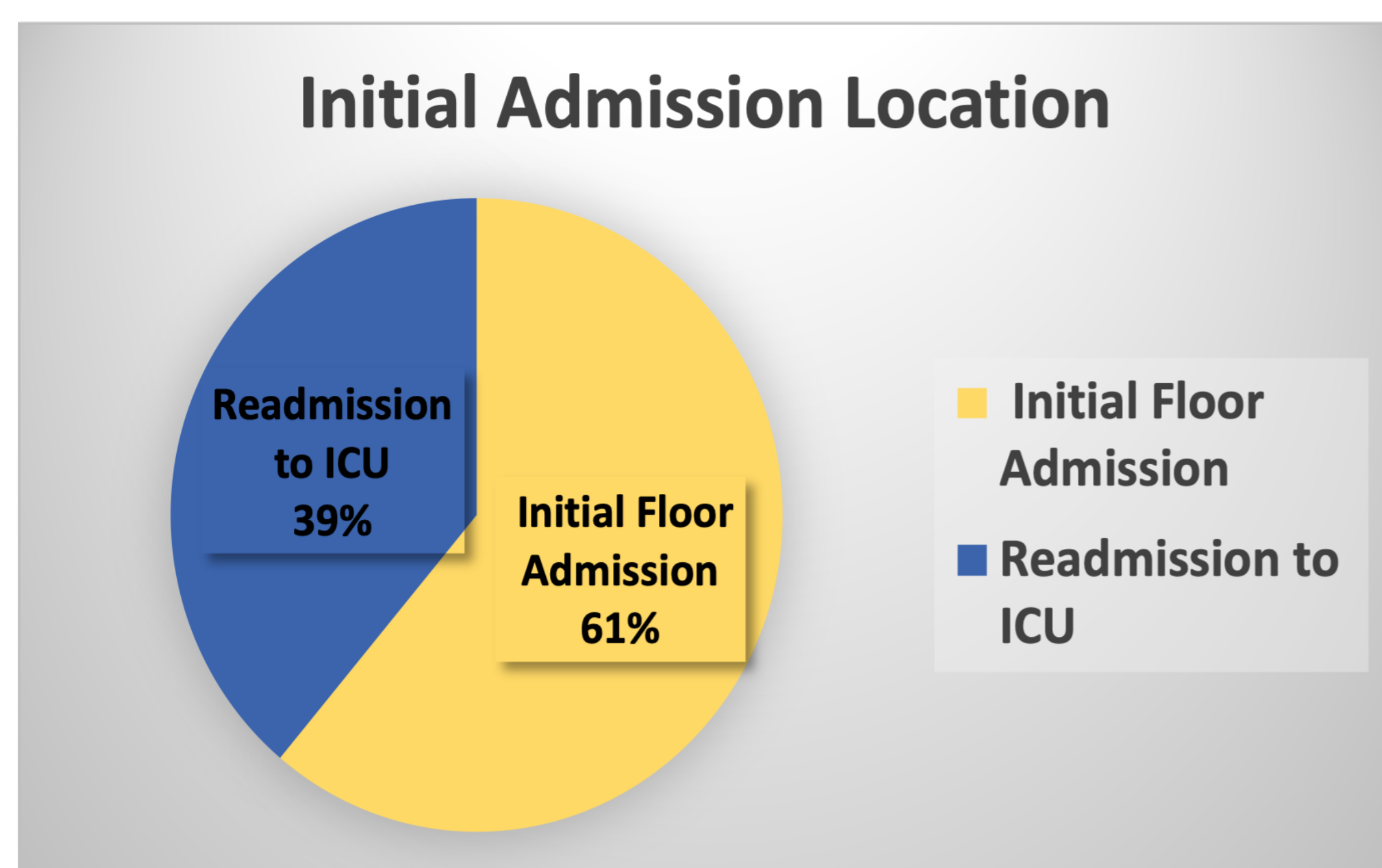
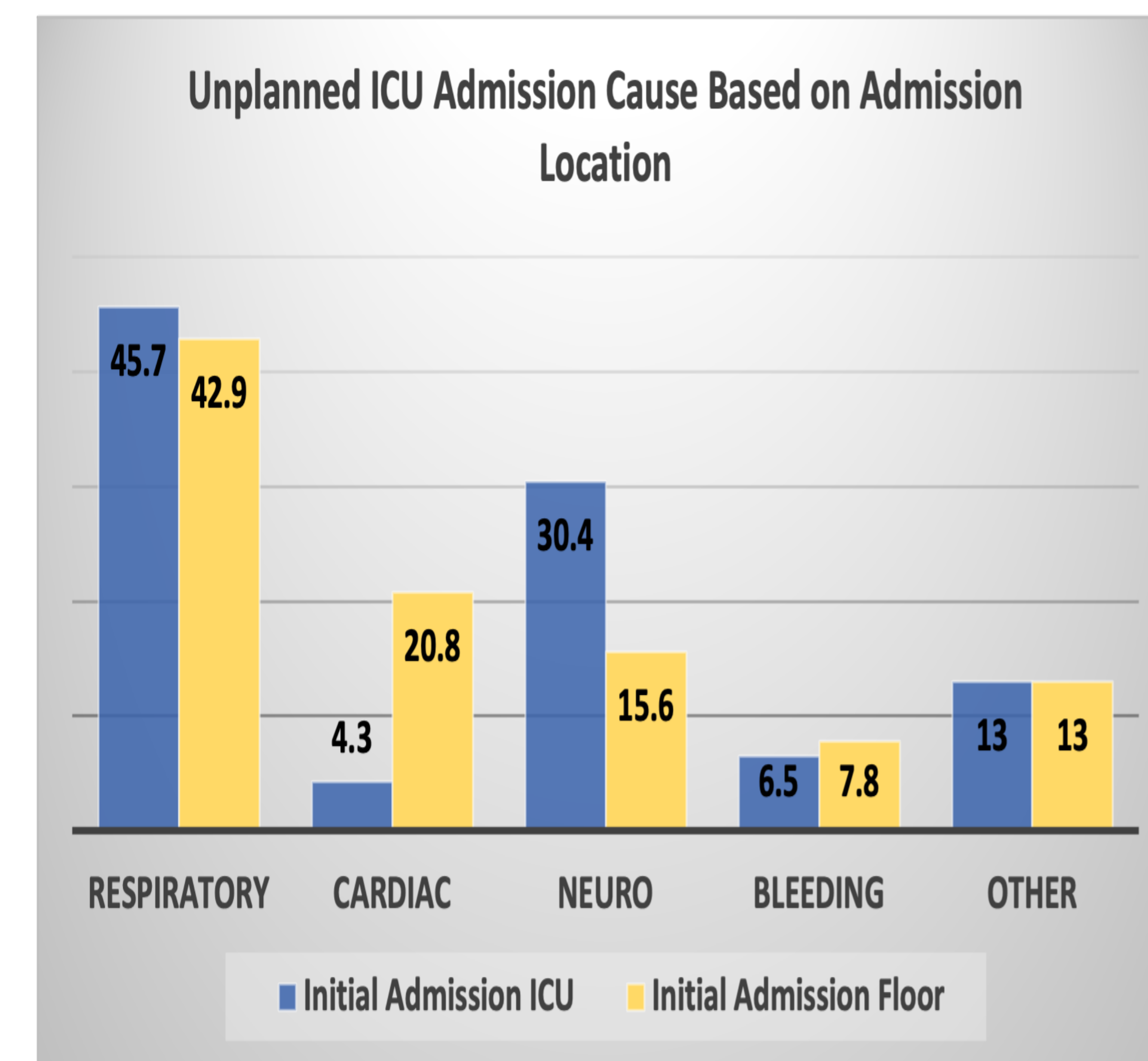


Figure 2. Unplanned ICU Admission Cause Based on Admission Location



**4. CONCLUSION:** This GQIP drill-down provided leading causes for unplanned ICU admissions in a low probability cohort. This analysis can be used to guide future efforts in decreasing unplanned ICU admissions. Focus should be on decreasing overall respiratory, neurologic and cardiac complications, which lead to unplanned ICU admissions.