Supplemental Material

Supplemental Table 1. Diagnostic codes used for classification of diseases in study.

Disease/Condition	ICD-9 Codes	ICD-10 Codes
Type 1 diabetes	250.01, 250.03, 250.11, 250.13,	E10.xx
	250.21, 250.23, 250.31, 250.33,	
	250.41, 250.43, 250.51, 250.53,	
	250.61, 250.63, 250.71, 250.73,	
	250.81, 250,83, 250.91, 250.93	
Type 2 diabetes	250.00, 250.02, 250.10, 250.12,	E11.xx
	250.20, 250.22, 250.30, 250.32,	
	250.40, 250.42, 250.50, 250.52,	
	250.60, 250.62, 250.70, 250.72,	
	250.80, 250,82, 250.90, 250.92	
	249.xx	E08.xx, E09.xx, E13.xx, E89.1
Hypoglycemia	251.2	E08.641, E08.649, E09.641,
		E09.649, E10.641, E10.649,
		E11.641, E11.649, E16.0, E16.1,
		E16.2

Age (years), median (IQR) Sex: Male, No.(%) Race, No.(%) White Black Other	n=17373 62.0 (47.0, 72.0) 8044 (46.3%) 7802 (44.9%) 7682 (44.2%)	n=2853 62.0 (50.0, 73.0) 1382 (48.4%)	<0.001 0.034
Sex: Male, No.(%) Race, No.(%) White Black	8044 (46.3%) 7802 (44.9%) 7682 (44.2%)	1382 (48.4%)	
Race, No.(%) White Black	7802 (44.9%) 7682 (44.2%)		0.034
White Black	7682 (44.2%)		
Black	7682 (44.2%)		
		1214 (42.6%)	0.003
Other		1358 (47.6%)	
	1889 (10.9%)	281 (9.8%)	
BMI (kg/m2), median (IQR)	26.5 (22.1, 31.8)	25.8 (22.0, 31.2)	0.009
Length of stay (days), median (IQR)	8.2 (4.3, 18.8)	8.0 (4.0, 17.5)	0.009
Hospital type, No.(%)			
Academic	10054 (57.9%)	1828 (64.1%)	< 0.001
Community	7319 (42.1%)	1025 (35.9%)	
Admitting service at time of CBG results, No.(%)			
Medicine	5383 (31.1%)	793 (27.9%)	<0.001
Emergency Room	1960 (11.3%)	525 (18.5%)	
Intensive Care Unit	3480 (20.1%)	695 (24.4%)	
Intermediate Care Unit	1903 (11.0%)	335 (11.8%)	
Labor & Delivery/ Obstetrics	694 (4.0%)	29 (1.0%)	
Pediatrics	180 (1.0%)	51 (1.8%)	
Psychiatry	430 (2.5%)	47 (1.7%)	
Operating Room	265 (1.5%)	43 (1.5%)	
Procedural	218 (1.3%)	25 (0.9%)	
Surgery	2812 (16.2%)	302 (10.6%)	
Diagnosis of diabetes at admission, No.(%)			
None	9904 (57.0%)	1607 (56.3%)	0.54
Type 1 Diabetes	682 (3.9%)	114 (4.0%)	
Type 2 Diabetes	6444 (37.1%)	1085 (38.0%)	
Other types	343 (2.0%)	47 (1.6%)	
Diet, No.(%)			
Regular diet	5073 (29.2%)	697 (24.4%)	<0.001
Carbohydrate controlled	4653 (26.8%)	669 (23.4%)	
NPO or clear liquid	5084 (29.3%)	863 (30.2%)	
Other or unknown	2563 (14.8%)	624 (21.9%)	
Medications On Board, No.(%)			
Glucocorticoid, No.(%)	1197 (6.9%)	185 (6.5%)	0.43
Insulin, No.(%)	6606 (38.0%)	1068 (37.4%)	0.55
Secretagogue, No.(%)	629 (3.6%)	73 (2.6%)	0.004
Hypoglycemia Treatment Medications ^a , No. (%)	025 (5.070)	73 (2.070)	0.004
Dextrose oral gel	43 (0.2%)	7 (0.2%)	0.98
Dextrose IV	884 (5.1%)	245 (8.6%)	<0.001
Glucagon IM	34 (0.2%)	18 (0.6%)	<0.001
Dextrose and/or glucagon	959 (5.5%)	2698 (9.4%)	<0.001
CBG Summary Measures	333 (3.370)	2030 (3.470)	\U.UUI
Index CBG Value, mg/dL, median (IQR)	62.0 (54.0, 67.0)	51.0 (39.0, 61.0)	<0.001
Index CBG value, mg/aL, median (IQR)	02.0 (34.0, 07.0)	JI.0 (39.0, 0I.0)	\U.UUI
54-70 mg/dl	13214 (76.1%)	1293 (45.3%)	<0.001

Supplemental Table 2. Patient and Admission Characteristics at Time of Index Hypoglycemic CBG Readings by Time to repeat \leq 15 min

40-53 mg/dl	3108 (17.9%)	846 (29.7%)		
<40 mg/dl	1051 (6.0%)	714 (25.0%)		
Any previous CBG ≤70 mg/dL during admission, No.(%)	12139 (69.9%)	1951 (68.4%)	0.11	
Admission coefficient of variation of CBG, median (IQR)	0.4 (0.3, 0.5)	0.4 (0.3, 0.5)	<0.001	
Previous CBG value, median (IQR)	80.0 (65.0, 109.0)	85.0 (61.0, 123.5)	0.011	
^a within 15 minutes of index CBG value; IV, intravenous; IM, intramuscular; NPO, nil per os; CBG, capillary blood				
glucose; TTR= time to repeat; IQR, Interquartile range (25th percentile, 75th percentile)				

Factor	TTR ≤ 15 min	TTR 16-30 min	p-value
	n=2853	n=3796	
Age (years), median (IQR)	62.0 (50.0, 73.0)	61.0 (48.0, 72.0)	0.003
Sex: Male, No.(%)	1382 (48.4%)	1837 (48.4%)	0.97
Race, No.(%)			
White	1214 (42.6%)	1754 (46.2%)	0.004
Black	1358 (47.6%)	1651 (43.5%)	
Other	281 (9.8%)	391 (10.3%)	
BMI (kg/m2), median (IQR)	25.8 (22.0, 31.2)	26.1 (22.2, 31.6)	0.25
Length of stay (days), median (IQR)	8.0 (4.0, 17.5)	8.2 (4.3, 19.2)	0.025
Hospital type, No.(%)			
Academic	1828 (64.1%)	2372 (62.5%)	0.18
Community	1025 (35.9%)	1424 (37.5%)	
Admitting service at time of CBG results, No.(%)			
Medicine	793 (27.9%)	1151 (30.4%)	<0.001
Emergency Room	525 (18.5%)	459 (12.1%)	
Intensive Care Unit	695 (24.4%)	801 (21.2%)	
Intermediate Care Unit	335 (11.8%)	418 (11.0%)	
Labor & Delivery/ Obstetrics	29 (1.0%)	54 (1.4%)	
Pediatrics	51 (1.8%)	42 (1.1%)	
Psychiatry	47 (1.7%)	138 (3.6%)	
Operating Room	43 (1.5%)	51 (1.3%)	
Procedural	25 (0.9%)	42 (1.1%)	
Surgery	302 (10.6%)	631 (16.7%)	
Diagnosis of diabetes at admission, No.(%)			
None	1607 (56.3%)	1924 (50.7%)	<0.001
Type 1 Diabetes	114 (4.0%)	212 (5.6%)	
Type 2 Diabetes	1085 (38.0%)	1579 (41.6%)	
Other types	47 (1.6%)	81 (2.1%)	
Diet, No.(%)			
Regular diet	697 (24.4%)	993 (26.2%)	<0.001
Carbohydrate controlled	669 (23.4%)	1156 (30.5%)	
NPO or clear liquid	863 (30.2%)	1056 (27.8%)	
Other or unknown	624 (21.9%)	591 (15.6%)	
Medications On Board, No.(%)	021(21070)	551 (15.676)	
Glucocorticoid	185 (6.5%)	273 (7.2%)	0.26
Insulin	1068 (37.4%)	1762 (46.4%)	<0.001
Secretagogue	73 (2.6%)	104 (2.7%)	0.65
Hypoglycemia Treatment Medications ^a , No. (%)	73 (2.070)	104 (2.776)	0.05
Dextrose oral gel	7 (0.2%)	15 (0.4%)	0.29
Dextrose IV	245 (8.6%)	365 (9.6%)	0.15
Glucagon IM	18 (0.6%)	14 (0.4%)	0.13
Dextrose and/or glucagon	268 (9.4%)	394 (10.4%)	0.13
CBG Summary Measures	200 (5.470)	334 (10.470)	0.10
Index CBG Value, mg/dL, median (IQR)	51.0 (39.0, 61.0)	57.0 (47.0, 64.0)	<0.001
Index Hypoglycemic Category, No.(%)	51.0 (55.0, 01.0)	57.0 (47.0, 04.0)	\U.UUI
54-70 mg/dl	1202 (45 20/)		<0.001
54-70 mg/ui	1293 (45.3%)	2257 (59.5%)	<0.001

Supplemental Table 3. Patient and Admission Characteristics at Time of Index Hypoglycemic CBG Readings by Time to repeat 16-30 min

40-53 mg/dl	846 (29.7%)	1042 (27.4%)		
<40 mg/dl	714 (25.0%)	497 (13.1%)		
Any previous CBG ≤70 mg/dL during admission, No.(%)	1951 (68.4%)	2820 (74.3%)	<0.001	
Admission coefficient of variation of CBG, median (IQR)	0.4 (0.3, 0.5)	0.4 (0.3, 0.5)	<0.001	
Previous CBG value, median (IQR)	85.0 (61.0, 123.5)	76.0 (56.0,	<0.001	
^a within 15 minutes of index CBG value; IV, intravenous; IM, intramuscular; NPO, nil per os; CBG, capillary blood				
glucose; TTR= time to repeat; IQR, Interquartile range (25th percentile, 75th percentile)				

Factor	TTR ≤ 15 min	TTR 31-45 min	p-value
	n=2853	n=2981	
Age (years), median (IQR)	62.0 (50.0, 73.0)	62.0 (49.0, 72.0)	0.044
Sex: Male, No.(%)	1382 (48.4%)	1405 (47.1%)	0.32
Race, No.(%)			
White	1214 (42.6%)	1318 (44.2%)	0.050
Black	1358 (47.6%)	1331 (44.6%)	
Other	281 (9.8%)	332 (11.1%)	
BMI (kg/m2), median (IQR)	25.8 (22.0, 31.2)	26.5 (22.0, 31.6)	0.14
Length of stay (days), median (IQR)	8.0 (4.0, 17.5)	8.2 (4.3, 19.3)	0.025
Hospital type, No.(%)			
Academic	1828 (64.1%)	1779 (59.7%)	<0.001
Community	1025 (35.9%)	1202 (40.3%)	
Admitting service at time of CBG results, No.(%)			
Medicine	793 (27.9%)	938 (31.6%)	<0.001
Emergency Room	525 (18.5%)	342 (11.5%)	
Intensive Care Unit	695 (24.4%)	665 (22.4%)	
Intermediate Care Unit	335 (11.8%)	306 (10.3%)	
Labor & Delivery/ Obstetrics	29 (1.0%)	49 (1.6%)	
Pediatrics	51 (1.8%)	28 (0.9%)	
Psychiatry	47 (1.7%)	57 (1.9%)	
Operating Room	43 (1.5%)	52 (1.8%)	
Procedural	25 (0.9%)	35 (1.2%)	
Surgery	302 (10.6%)	499 (16.8%)	
Diagnosis of diabetes at admission, No.(%)			
None	1607 (56.3%)	1578 (52.9%)	0.017
Type 1 Diabetes	114 (4.0%)	128 (4.3%)	
Type 2 Diabetes	1085 (38.0%)	1201 (40.3%)	
Other types	47 (1.6%)	74 (2.5%)	
Diet, No.(%)			
Regular diet	697 (24.4%)	762 (25.6%)	<0.001
Carbohydrate controlled	669 (23.4%)	862 (28.9%)	
NPO or clear liquid	863 (30.2%)	911 (30.6%)	
Other or unknown	624 (21.9%)	446 (15.0%)	
Medications On Board, No.(%)			
Glucocorticoid	185 (6.5%)	203 (6.8%)	0.62
Insulin	1068 (37.4%)	1272 (42.7%)	<0.001
Secretagogue	73 (2.6%)	101 (3.4%)	0.063
Hypoglycemia Treatment Medications ^a , No. (%)			
Dextrose oral	7 (0.2%)	17 (0.6%)	0.053
Dextrose IV	245 (8.6%)	261 (8.8%)	0.82
Glucagon IM	18 (0.6%)	8 (0.3%)	0.038
Dextrose and/or glucagon	268 (9.4%)	284 (9.5%)	0.86
CBG Summary Measures		, ,	
BG Value, mg/dL, median (IQR)	51.0 (39.0, 61.0)	59.0 (51.0, 65.0)	<0.001
Index Hypoglycemic Category, No.(%)		, , -,	
54-70 mg/dl	1293 (45.3%)	2017 (67.7%)	<0.001

Supplemental Table 4. Patient and Admission Characteristics at Time of Index Hypoglycemic CBG Readings by Time to repeat 31-45 min

40-53 mg/dl	846 (29.7%)	718 (24.1%)			
<40 mg/dl	714 (25.0%)	246 (8.3%)			
Any previous CBG ≤70 mg/dL during admission, No.(%)	1951 (68.4%)	2188 (73.4%)	<0.001		
Admission coefficient of variation of CBG, median (IQR)	0.4 (0.3, 0.5)	0.4 (0.3, 0.5)	0.34		
Previous CBG value, median (IQR)	85.0 (61.0, 123.5)	79.0 (60.0,	<0.001		
^a within 15 minutes of index CBG value; IV, intravenous; IM, intramuscular; NPO, nil per os; CBG, capillary blood					
glucose; TTR= time to repeat; IQR, Interquartile range (25th percentile, 75th percentile)					

Factor	TTR ≤ 15 min	TTR 46-60 min	P-value
No. of Index CBG events	n=2,853	n=2,033	-
Age (years), median (IQR)	62.0 (50.0, 73.0)	61.0 (47.0, 71.0)	<0.001
Sex: Male, No.(%)	1382 (48.4%)	950 (46.7%)	0.24
Race, No.(%)			
White	1214 (42.6%)	906 (44.6%)	0.002
Black	1358 (47.6%)	877 (43.1%)	
Other	281 (9.8%)	250 (12.3%)	
BMI (kg/m2), median (IQR)	25.8 (22.0, 31.2)	26.8 (22.5, 31.9)	<0.001
Length of stay (days), median (IQR)	8.0 (4.0, 17.5)	7.4 (4.1, 17.2)	0.42
Hospital type, No.(%)			
Academic	1828 (64.1%)	1159 (57.0%)	<0.001
Community	1025 (35.9%)	874 (43.0%)	
Admitting service at time of CBG results, No.(%)			
Medicine	793 (27.9%)	578 (28.5%)	<0.001
Emergency Room	525 (18.5%)	256 (12.6%)	
Intensive Care Unit	695 (24.4%)	482 (23.8%)	
Intermediate Care Unit	335 (11.8%)	208 (10.3%)	
Labor & Delivery/ Obstetrics	29 (1.0%)	61 (3.0%)	
Pediatrics	51 (1.8%)	24 (1.2%)	
Psychiatry	47 (1.7%)	38 (1.9%)	
Operating Room	43 (1.5%)	39 (1.9%)	
Procedural	25 (0.9%)	29 (1.4%)	
Surgery	302 (10.6%)	314 (15.5%)	
Diagnosis of diabetes at admission, No.(%)			
None	1607 (56.3%)	1137 (55.9%)	0.25
Type 1 Diabetes	114 (4.0%)	89 (4.4%)	
Type 2 Diabetes	1085 (38.0%)	758 (37.3%)	
Other types	47 (1.6%)	49 (2.4%)	
Diet, No.(%)			
Regular diet	697 (24.4%)	499 (24.5%)	<0.001
Carbohydrate controlled	669 (23.4%)	555 (27.3%)	
NPO or clear liquid	863 (30.2%)	616 (30.3%)	
Other or unknown	624 (21.9%)	363 (17.9%)	
Medications On Board, No.(%)			
Glucocorticoid	185 (6.5%)	116 (5.7%)	0.26
Insulin	1068 (37.4%)	794 (39.1%)	0.25
Secretagogue	73 (2.6%)	67 (3.3%)	0.13
Hypoglycemia Treatment Medications ^a , No. (%)			
Dextrose oral	7 (0.2%)	6 (0.3%)	0.74
Dextrose IV	245 (8.6%)	98 (4.8%)	<0.001
Glucagon IM	18 (0.6%)	3 (0.1%)	0.011
Dextrose and/or glucagon	268 (9.4%)	107 (5.3%)	<0.001
CBG Summary Measures	, ,		
BG Value, mg/dL, median (IQR)	51.0 (39.0, 61.0)	61.0 (53.0, 67.0)	<0.001
Index Hypoglycemic Category, No.(%)			

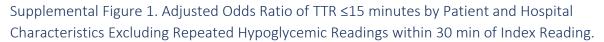
Supplemental Table 5. Patient and Admission Characteristics at Time of Index Hypoglycemic CBG Readings by Time to repeat 46-60 min

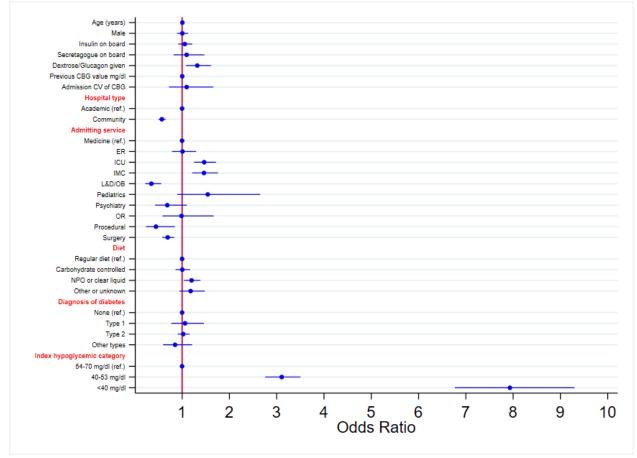
54-70 mg/dl	1293 (45.3%)	1518 (74.7%)	<0.001	
40-53 mg/dl	846 (29.7%)	387 (19.0%)		
<40 mg/dl	714 (25.0%)	128 (6.3%)		
Any previous CBG ≤70 mg/dL during admission, No.(%)	1951 (68.4%)	1424 (70.0%)	0.22	
Admission coefficient of variation of CBG, median (IQR)	0.4 (0.3, 0.5)	0.4 (0.3, 0.5)	0.14	
Previous CBG value, median (IQR)	85.0 (61.0, 123.5)	80.0 (65.0,	0.018	
^a within 15 minutes of index CBG value; IV, intravenous; IM, intramuscular; NPO, nil per os; CBG, capillary blood				
glucose; TTR= time to repeat; IQR, Interquartile range (25th percentile, 75th percentile)				

Factor	TTR ≤ 15 min	TTR >60 min	p-value
	n=2853	n=8563	
Age (years), median (IQR)	62.0 (50.0, 73.0)	62.0 (47.0, 72.0)	<0.001
Sex: Male, No.(%)	1382 (48.4%)	3852 (45.0%)	0.001
Race, No.(%)			
White	1214 (42.6%)	3824 (44.7%)	0.021
Black	1358 (47.6%)	3823 (44.6%)	
Other	281 (9.8%)	916 (10.7%)	
BMI (kg/m2), median (IQR)	25.8 (22.0, 31.2)	26.5 (22.0, 31.9)	0.012
Length of stay (days), median (IQR)	8.0 (4.0, 17.5)	8.4 (4.5, 18.9)	0.002
Hospital type, No.(%)			
Academic	1828 (64.1%)	4744 (55.4%)	<0.001
Community	1025 (35.9%)	3819 (44.6%)	
Admitting service at time of CBG results, No.(%)			
Medicine	793 (27.9%)	2716 (31.8%)	<0.001
Emergency Room	525 (18.5%)	903 (10.6%)	
Intensive Care Unit	695 (24.4%)	1532 (17.9%)	
Intermediate Care Unit	335 (11.8%)	971 (11.4%)	
Labor & Delivery/ Obstetrics	29 (1.0%)	530 (6.2%)	
Pediatrics	51 (1.8%)	86 (1.0%)	
Psychiatry	47 (1.7%)	197 (2.3%)	
Operating Room	43 (1.5%)	123 (1.4%)	
Procedural	25 (0.9%)	112 (1.3%)	
Surgery	302 (10.6%)	1368 (16.0%)	
Diagnosis of diabetes at admission, No.(%)			
None	1607 (56.3%)	5265 (61.5%)	<0.001
Type 1 Diabetes	114 (4.0%)	253 (3.0%)	
Type 2 Diabetes	1085 (38.0%)	2906 (33.9%)	
Other types	47 (1.6%)	139 (1.6%)	
Diet, No.(%)			
Regular diet	697 (24.4%)	2819 (32.9%)	<0.001
Carbohydrate controlled	669 (23.4%)	2080 (24.3%)	
NPO or clear liquid	863 (30.2%)	2501 (29.2%)	
Other or unknown	624 (21.9%)	1163 (13.6%)	
Medications On Board, No.(%)			
Glucocorticoid	185 (6.5%)	605 (7.1%)	0.29
Insulin	1068 (37.4%)	2778 (32.4%)	<0.001
Secretagogue	73 (2.6%)	357 (4.2%)	<0.001
Hypoglycemia Treatment Medications ^a , No. (%)			
Dextrose oral	7 (0.2%)	5 (0.1%)	0.008
Dextrose IV	245 (8.6%)	160 (1.9%)	< 0.001
Glucagon IM	18 (0.6%)	9 (0.1%)	< 0.001
Dextrose and/or glucagon	268 (9.4%)	174 (2.0%)	<0.001
CBG Summary Measures			
BG Value, mg/dL, median (IQR)	51.0 (39.0, 61.0)	65.0 (59.0, 68.0)	<0.001
Index Hypoglycemic Category, No.(%)	51.0 (55.0, 51.0)		
54-70 mg/dl	1293 (45.3%)	7422 (86.7%)	<0.001

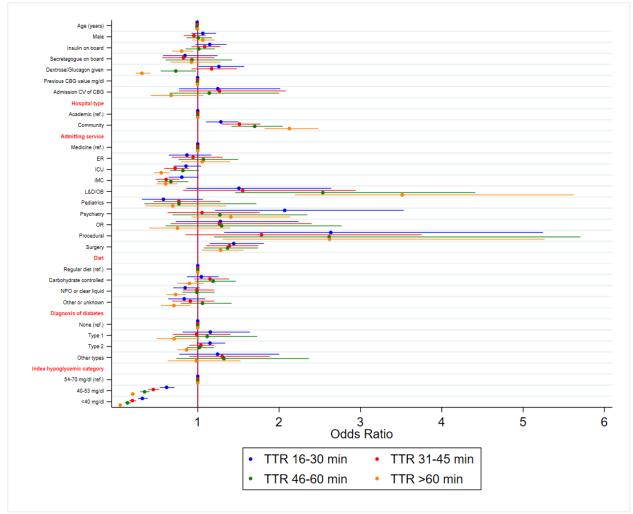
Supplemental Table 6. Patient and Admission Characteristics at Time of Index Hypoglycemic CBG Readings by Time to repeat >60 min

40-53 mg/dl	846 (29.7%)	961 (11.2%)		
<40 mg/dl	714 (25.0%)	180 (2.1%)		
Any previous CBG ≤70 mg/dL during admission, No.(%)	1951 (68.4%)	5707 (66.6%)	0.087	
Admission coefficient of variation of CBG, median (IQR)	0.4 (0.3, 0.5)	0.3 (0.2, 0.4)	<0.001	
Previous CBG value, median (IQR)	85.0 (61.0, 123.5)	82.0 (69.0,	0.47	
^a within 15 minutes of index CBG value; IV, intravenous; IM, intramuscular; NPO, nil per os; CBG, capillary blood				
glucose; TTR= time to repeat; IQR, Interquartile range (25th percentile, 75th percentile)				

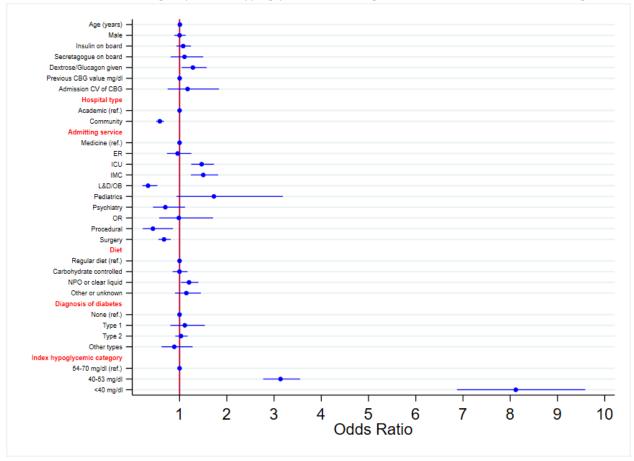




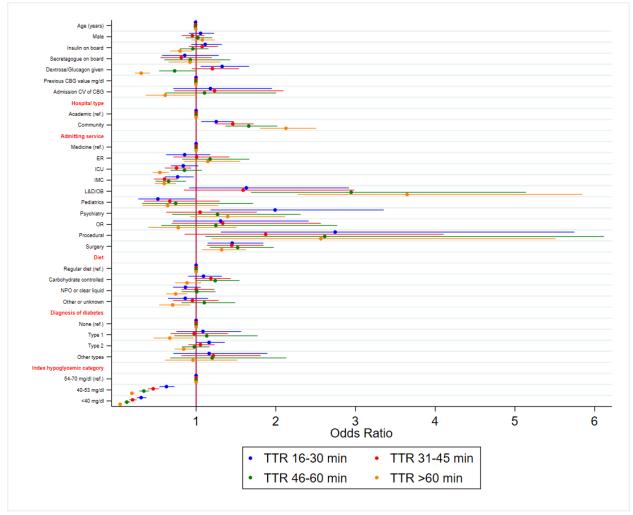
Supplemental Figure 2. Adjusted Odds Ratios of Patient Admission Characteristics at Time of Index Hypoglycemia Reading and TTR Outcome Measures Excluding Repeated Hypoglycemic Readings within 30 min of Index Reading.



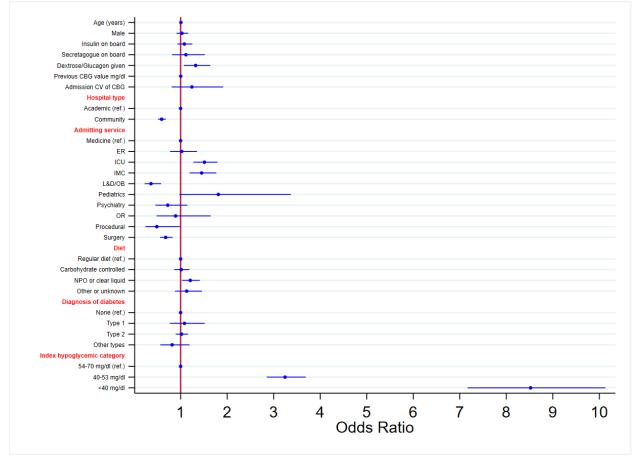
Supplemental Figure 3. Adjusted Odds Ratio of TTR ≤15 minutes by Patient and Hospital Characteristics Excluding Repeated Hypoglycemic Readings within 60 min of Index Reading.



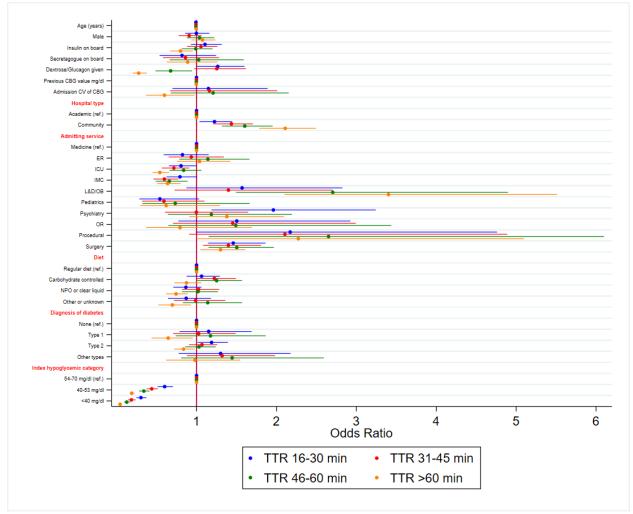
Supplemental Figure 4. Adjusted Odds Ratios of Patient Admission Characteristics at Time of Index Hypoglycemia Reading and TTR Outcome Measures Excluding Repeated Hypoglycemic Readings within 60 min of Index Reading

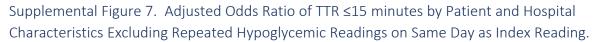


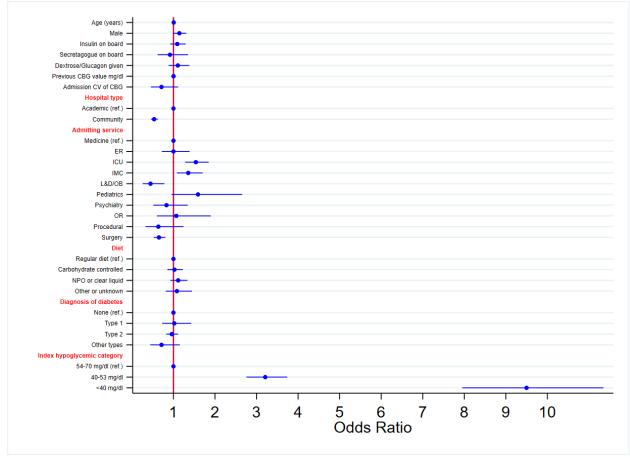




Supplemental Figure 6. Adjusted Odds Ratios of Patient Admission Characteristics at Time of Index Hypoglycemia Reading and TTR Outcome Measures Excluding Repeated Hypoglycemic Readings within 2 hours of Index Reading







Supplemental Figure 8. Adjusted Odds Ratios of Patient Admission Characteristics at Time of Index Hypoglycemia Reading and TTR Outcome Measures Excluding Repeated Hypoglycemic Readings on Same Day as Index Reading

