**Supplementary Materials**

Table S1. ICD-9 and ICD-10 codes to ascertain acute hypoglycemic events

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| ICD-9 codes |
| 251.0 | Hypoglycemic coma |
| 251.1 | Other specified hypoglycemia/hypoglycemia due to insulin |
| 251.2 | Hypoglycemia/Hypoglycemia, unspecified |
| 962.3 | Poisoning by insulins and antidiabetic agents |
| 250.8\* | Type 2 or unspecified type of diabetes mellitus with other specified manifestations, not stated as uncontrolled |
|  |  |
| ICD-10 codes |
| E08.641 | Diabetes mellitus due to underlying condition with hypoglycemia with coma |
| E08.649 | Diabetes mellitus due to underlying condition with hypoglycemia without coma |
| E08.641 | Drug or chemical induced diabetes mellitus with hypoglycemia with coma |
| E09.649 | Drug or chemical induced diabetes mellitus with hypoglycemia without coma |
| E10.641 | Type 1 diabetes mellitus with hypoglycemia with coma |
| E10.649 | Type 1 diabetes mellitus with hypoglycemia without coma |
| E11.641 | Type 2 diabetes mellitus with hypoglycemia with coma |
| E11.649 | Type 2 diabetes mellitus with hypoglycemia without coma |
| E13.641 | Other specified diabetes mellitus with hypoglycemia with coma |
| E13.649 | Other specified diabetes mellitus with hypoglycemia without coma |
| E15.x | Drug-induced insulin coma in non-diabetic/hyperinsulinism with hypoglycemic coma/hypoglycemic coma, unspecified |
| E16.0 | Drug-induced hypoglycemia without coma |
| E16.1 | Other hypoglycemia |
| E16.2 | Hypoglycemia, unspecified |
| \*Without any of the following co-diagnoses: 259.8 (other specified endocrine disorders), 272.7 (lipidoses), 681.XX (cellulitis/abscess of finger/toe/other digit, 682.XX (cellulitis/abscess of face/neck/arm/etc., 686.9X (local infection), 707.1-707.9 (ulcers), 709.3 (degenerative skin disorders, 730.0-730.2 (osteomyelitis) or 731.8(other bone involvement in disease classified elsewhere)  |

Table S2. Association between traditional risk factors, time-varying medication changes and acute hypoglycemic events defined without the use of ICD-9 code ‘250.80’

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Model 1: Univariate Model |  Model 2: Multivariate model\* |
|  |  | HR (95% CI) | HR (95% CI) |
| Age |  |  |  |
|  | <60 years old | REF | REF |
|  | 60-<70 years old | 1.03 (0.68, 1.56) | 1.08 (0.72, 1.63) |
|  | 70-<80 years | 0.97 (0.60, 1.55) | 1.00 (0.61, 1.63) |
|  | ≥80 years old | 1.24 (0.77, 1.99) | 1.30 (0.75, 2.22) |
| Female |  | 1.01 (0.72, 1.42) | 0.96 (0.68, 1.34) |
| Race/ethnicity |  |  |
|  | Non-Hispanic White | REF | REF |
|  | Non-Hispanic Asian | 0.85 (0.53, 1.37) | 0.90 (0.58, 1.42) |
|  | Non-Hispanic Black | 2.65 (1.72, 4.07) | 2.27 (1.42, 3.63) |
|  | Hispanic | 1.54 (0.87, 2.73) | 1.46 (0.85, 2.52) |
|  | Other/Unknown | 0.93 (0.53, 1.64) | 1.01 (0.57, 1.77) |
| HbA1c category |  |  |
|  | <6% | 1.94 (1.22, 3.09) | 1.61 (1.00, 2.59) |
|  | 6-6.9% | REF | REF |
|  | 7-7.9% | 0.86 (0.56, 1.33) | 0.78 (0.50, 1.21) |
|  | 8-8.9% | 1.87 (1.18, 2.97) | 1.37 (0.84, 2.21) |
|  | ≥9% | 1.51 (0.95, 2.43) | 0.98 (0.59, 1.64) |
| CKD (Stage 4-5) |  |  |
|  | No  | REF | REF |
|  | Yes  | 5.56 (3.73, 8.29) | 3.02 (1.94, 4.68) |
| Medication orders, pre-HbA1c |  |  |
|  | Any insulin | 2.76 (1.37, 5.59) | 1.93 (0.97, 3.87) |
|  | Any secretagogues, no insulin | 1.01 (0.50, 2.06) | 0.97 (0.47, 1.97) |
|  | Metformin only | 0.32 (0.13, 0.79) | 0.33 (0.14, 0.82) |
|  | Other glucose-lowering medication  | REF | REF |
| Insurance |  |  |
|  | Private | REF | REF |
|  | Medicare | 2.51 (1.63, 3.88) | 2.07 (1.31, 3.25) |
|  | Medicaid | 2.43 (1.40, 4.21) | 1.90 (1.09, 3.32) |
|  | Other/Unknown | 2.75 (1.13, 6.68) | 2.61 (1.08, 2.16) |
| Change in medication after HbA1c measurement |  |  |
|  | Change in insulin medication orders | 2.44 (1.76, 3.38) | 1.53 (1.08, 2.16) |
|  | Change in secretagogue medication orders, no change to insulin | 0.65 (0.34, 1.23) | 0.77 (0.40, 1.47) |
|  | Change in metformin only | 0.09 (0.01, 0.65) | 0.15 (0.02, 1.04) |
|  | Other glucose-lowering medication change | 0.59 (0.19, 1.83) | 0.66 (0.22, 2.03) |
|  | No change in medication orders | REF | REF |

Table S2 Footnotes: Extended cox models are used to examine the association between traditional risk factors and acute hypoglycemic events. Acute hypoglycemic events are identified via ICD-9 and ICD-10 diagnosis codes from encounters that occurred in the emergency department or in the hospital (and were present on admission); this sensitivity analysis excludes all acute hypoglycemic events identified using the ICD-9 code ‘250.80’. Race/ethnicity was based on patients' self-reported race/ethnicity. CKD was determined using eGFR labs, patients with Stage 4-5 CKD had eGFR lab values ≤29 mL/min/1.73m2. Insurance status was determined using the insurance class recorded for the last available encounter preceding the index date. \*Simultaneously adjusted for age, sex, race/ethnicity, HbA1c category, CKD, medication orders during baseline, insurance coverage, and time-varying change in medication after HbA1c measurement.