**Table S1.** ICD-9/10-CM diagnosis codes for hypoglycemia

| | |
|---|---|
| ICD-9-CM [a] | 251.0; 251.1; 251.2; 250.8 and without any of co-diagnosis: 259.8, 272.7, 681.xx, 682.xx, 686.9x, 707.xx, 709.3, 730.0–730.2, or 731.8. |
| ICD-10-CM [b] | E160; E161; E162; E1164; E1364; E1064; E0864. |

ICD-9/10-CM, International Classification of Disease, Ninth/Tenth Revision, Clinical Modification diagnosis codes.

*Source:* [a] Ginde AA, Blanc PG, Lieberman RM, Camargo CA Jr. Validation of ICD-9-CM coding algorithm for improved identification of hypoglycemia visits. *BMC Endocr Disord.* 2008;8:4. [b] Dugan J, Shubrook J. International Classification of Diseases, 10th Revision, Coding for Diabetes. *Clin Diabetes*. 2017;35(4):232-238.

**Table S2.** ICD-9/10-CM diagnosis and CPT codes for solid organ transplants

| | | |
|---|---|---|
| ICD-9 [a] | Diagnosis | Kidney: 996.81; V42.0;<br>Heart: 996.83; V42.1;<br>Lung: 996.84; V42.6;<br>Liver: 996.82; V42.7. |
| | Procedure | Kidney: 5561; 5569<br>Heart: 3751;<br>Lung: 3350; 3351;3352;<br>Liver: 5051; 5059. |
| ICD-10 [b] | Diagnosis | Kidney:<br>T86.10; T86.11; T86.12; T86.13; T8619; Z94.0;<br>Heart:<br>T86.20; T86.21; T86.22; T86.23; T86.290; T86.298; Z94.1;<br>Lung:<br>T86.810; T86.811; T86.812; T86.818; T86.819; Z94.2;<br>Liver:<br>T86.40; T86.41; T86.42; T86.43; T86.49; Z94.4. |
| | Procedure | Kidney:<br>0TY00Z0; 0TY00Z1; 0TY00Z2; 0TY10Z0; 0TY10Z1; 0TY10Z2;<br>Heart:<br>02YA0Z0; 02YA0Z1; 02YA0Z2;<br>Lung:<br>0BYK0Z0; 0BYK0Z1; 0BYK0Z2; 0BYL0Z0; 0BYL0Z1; 0BYL0Z2;<br>0BYC0Z0; 0BYC0Z1; 0BYC0Z2; 0BYD0Z0; 0BYD0Z1; 0BYD0Z2;<br>0BYF0Z0; 0BYF0Z1; 0BYF0Z2; 0BYG0Z0; 0BYG0Z1; 0BYG0Z2;<br>0BYH0Z0; 0BYH0Z1; 0BYH0Z2; 0BYJ0Z0; 0BYJ0Z1; 0BYJ0Z2;<br>0BYK0Z0; 0BYK0Z1; 0BYK0Z2; 0BYL0Z0; 0BYL0Z1; 0BYL0Z2;<br>0BYM0Z0; 0BYM0Z1; 0BYM0Z2;<br>Liver:<br>0FY00Z0; 0FY00Z1; 0FY00Z2. |
| CPT [a] | | Kidney: 50360; 50365;<br>Heart: 33945;<br>Lung: 00580; 32854; 32853; 32852; 32851; 33935;<br>Liver: 47135. |

ICD-9/10-CM, International Classification of Disease, Ninth/Tenth Revision, Clinical Modification diagnosis codes.

*Source:* [a] Sigel K, Veluswamy R, Krauskopf K, et al. Lung Cancer Prognosis in Elderly Solid Organ Transplant Recipients. *Transplantation.* 2015;99(10):2181-2189. [b] HIPAASPACE. https://www.hipaaspace.com/medical_billing/crosswalk.services/icd-9.to.icd-10.mapping

**Table S3.** Non-glucose-lowering medications associated with hyperglycemia or hypoglycemia

| Category | Medication class | Mechanism of glucose lowering effects | Study | Design | Results/Summary | Selected medications in our study |
|---|---|---|---|---|---|---|
| Antihypertensive | Non-cardioselective beta blocker/ cardioselective beta blocker | Hypoglycemia; inhibit hepatic glucose production and glycogenolysis; attenuates signs and symptoms. | Shorr RI et al. (1997) | Retrospective cohort study, n=13,559 | Non-cardioselective beta blockers were associated with the highest rate of hypoglycemia, but none of the findings was statistically significant. | levobunolol, metipranolol, nadolol, propranolol, sotalol, timolol. |
| | | | Mays et al. (2011) | Systematic review | Non-cardioselective beta blockers such as propranolol are more likely to cause hypoglycemia than cardio selective ones such as atenolol and metoprolol. | |
| | Angiotensin-converting enzyme (ACE) inhibitors | Hypoglycemia; increases insulin sensitivity | Mays et al. (2011) | Systematic review | Small studies, and the data remain controversial. | |
| Lipid lowering medications | Statins | Hyperglycemia; Statins may lead to increase of insulin-resistance. | Kim et al. (2018) | Retrospective cohort of non-diabetic individuals, n= 379,865 | Use of atorvastatin, rosuvastatin, pitavastatin, and simvastatin were significantly associated with increase of the changes in fasting glucose. The effects of pravastatin, lovastatin, and fluvastatin were not significant. | atorvastatin, rosuvastatin, simvastatin. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | L. Maria Belalcazar et al. (2009) | Systematic review | Simvastatin and atorvastatin, but not pravastatin, have been shown to decrease insulin secretion in Beta cells./The JUPITER trial reported that rosuvastatin therapy was associated with a mild but significant increase in the identification of new-onset diabetes. | |
| Antidepressants | Monoamine oxidase inhibitors (MAOIs) | Hypoglycemia | Goodnick et al. (1995) | Systematic review | MAOIs use is related to the possible severity of the induced hypoglycemia, induced weight gain, and required diets. | isocarboxazid, phenelzine, selegiline, tranylcypromine. |
| | | | Barnard et al.(2013) | Systematic review | MAOIs were associated with improved glycemic control. | |
| | Serotonin selective reuptake inhibitors (SSRIs) | Hypoglycemia | Goodnick et al. (1995) | Systematic review | SSRIs may be hypoglycemic (causing as much as a 30% decrease in fasting plasma glucose). | citalopram, escitalopram, fluoxetine, paroxetine, sertraline. |
| | | | Barnard et al.(2013) | Systematic review | SSRIs were associated with improved glycemic control./Serotonergic antidepressants, such as fluoxetine, reduced hyperglycemia, normalized glucose homeostasis, and increased insulin sensitivity. | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Tricyclic antidepressants | Hyperglycemia | Goodnick et al. (1995) | Systematic review | The tricyclic antidepressants may lead to hyperglycemia, to an increase in carbohydrate craving (from 86% to 200%), and impaired memory. | amitriptyline, amoxapine, desipramine, doxepin, imipramine, nortriptyline, protriptyline, trimipramine. |
| | Serotonin-norepinephrine reuptake inhibitors (SNRI) | Dual-mechanism | Barnard et al.(2013) | Systematic review | Dual-mechanism antidepressants, such as duloxetine and venlafaxine, did not appear to disrupt glucose homeostasis dynamics. | |
| Antibiotics/ quinolones | Ciprofloxacin | Hypoglycemia | Berhe et al. (2019) | Cases report (35 cases) | This study suggests that ciprofloxacin can cause hypoglycemia even in nondiabetic patients. | ciprofloxacin, levofloxacin, moxifloxacin. |
| | | | Parekh et al. (2014) | Retrospective cohort study of Texas Medicare claims | Ciprofloxacin (odds ratio, 1.62 [95% CI, 1.33–1.97]) was associated with higher rates of hypoglycemia. | |
| | Levofloxacin | Hypoglycemia | Parekh et al. (2014) | Retrospective cohort study of Texas Medicare claims | Levofloxacin (odds ratio, 2.60 [95% CI, 2.18–3.10]) was associated with higher rates of hypoglycemia. | |
| | Moxifloxacin | Hypoglycemia | Parekh et al. (2014) | Retrospective cohort study of Texas Medicare claims | Moxifloxacin was not significantly associated with hypoglycemia. | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Food and Drug Administration (FDA, 2018) | | The FDA review found instances of hypoglycemic coma where users of fluoroquinolones experienced hypoglycemia | |
| Corticosteroids | | Hyperglycemia | | | | betamethasone, budesonide, dexamethasone, cortisone, methylprednisolone, prednisolone, prednisone. |

CI, confidence interval.

*Source*:

Shorr RI, Ray WA, Daugherty JR, Griffin MR. Antihypertensives and the Risk of Serious Hypoglycemia in Older Persons Using Insulin or Sulfonylureas. JAMA. 1997; 278 (1):40–43. https://jamanetwork.com/journals/jama/article-abstract/417273

Mays H. Vue, Stephen M. Setter. Drug-Induced Glucose Alterations Part 1: Drug-Induced Hypoglycemia. Diabetes Spectrum Aug 2011, 24 (3)171-177. https://spectrum.diabetesjournals.org/content/24/3/171.abstract

Kim, J., Lee, H.S. & Lee, K. Effect of statins on fasting glucose in non-diabetic individuals: nationwide population-based health examination in Korea. Cardiovasc Diabetol 17, 155 (2018). https://doi.org/10.1186/s12933-018-0799-4

Belalcazar, LM, Raghavan, VA, Ballantyne, CM. (2009). Statin-induced diabetes: will it change clinical practice?. Diabetes Care, 32(10), 1941-1943. https://care.diabetesjournals.org/content/32/10/1941

Barnard K, Peveler RC, Holt RI. Antidepressant medication as a risk factor for type 2 diabetes and impaired glucose regulation: systematic review. Diabetes Care. 2013; 36 (10):3337-3345. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3781547/

Goodnick PJ, Henry JH, Buki VM. Treatment of depression in patients with diabetes mellitus. J Clin Psychiatry. 1995; 56(4):128-136. https://pubmed.ncbi.nlm.nih.gov/7713850/#:~:text=Clinically%2C%20MAOI%20use%20is%20limited,200%25)%2C%20and%20impaired%20memory.

Berhe, A., Russom, M., Bahran, F. et al. Ciprofloxacin and risk of hypoglycemia in non-diabetic patients. J Med Case Reports 13, 142 (2019). https://jmedicalcasereports.biomedcentral.com/articles/10.1186/s13256-019-2083-y

Parekh TM, Raji M, Lin YL, Tan A, Kuo YF, Goodwin JS. Hypoglycemia after antimicrobial drug prescription for older patients using sulfonylureas. JAMA Intern Med. 2014; 174 (10):1605-1612. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4878670/#:~:text=is%20considerably%20greater.-,Conclusions,with%20higher%20resulting%20morbidity%20rates

FDA safety information, 2018.

https://www.fda.gov/drugs/drug-safety-and-availability/fda-reinforces-safety-information-about-serious-low-blood-sugar-levels-and-mental-health-side

**Table S4.** Chronic kidney disease stage-specific ICD-9/10-CM diagnosis codes

| CKD stage | ICD-9-CM diagnosis codes* | ICD-10-CM diagnosis codes* | GFR |
|---|---|---|---|
| Stage 1 | 585.1 | N18.1 | ≥90 ml/min/1.73 $m^2$ |
| Stage 2 | 585.2 | N18.2 | 60-89 ml/min/1.73 $m^2$ |
| Stage 3 | 585.3 | N18.3 | 30-59 ml/min/1.73 $m^2$ |
| Stage 4 | 585.4 | N18.4 | 15-29 ml/min/1.73 $m^2$ |
| Stage 5 | 585.5 | N18.5 | <15 ml/min/1.73 $m^2$ |

CKD, chronic kidney disease; ICD-9/10-CM, International Classification of Disease, Ninth/Tenth Revisions, Clinical Modification diagnosis codes; GFR, glomerular filtration rate.

*Source:* * United States Renal Data System (USRDS). 2020 USRDS annual data report: Epidemiology of kidney disease in the United States. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD.