**ONLINE-ONLY SUPPLEMENTAL MATERIAL**

**Supplemental Methods.** Statistical methods used to assess the effect of unmeasured confounding on the hazard ratios.

**Supplemental Table S1.** Outcome codes and descriptions for the identification of major adverse cardiovascular events within the United States data sources.

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**Supplemental Table S6.** Outcome codes and descriptions for the identification of acute kidney injury within the United States data sources.

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**Supplemental Table S8.** Outcome codes and descriptions for the identification of infection within the United States data sources.

**Supplemental Table S9:** Outcome codes and descriptions for the identification of infection within the United Kingdom data sources.

**Supplemental Table S10:** Outcome codes and descriptions for the identification of severe hypersensitivity reactions within the United States data sources.

**Supplemental Table S11:** Outcome codes and descriptions for the identification of severe hypersensitivity reactions within the United Kingdom data sources.

**Supplemental Table S12.** Validation of the electronic algorithm for each outcome of interest, by data source.

**Supplemental Table S13.** Incidence rates and hazard ratios of each outcome among those in each analytic cohort with the use of validated algorithms (where available), by data source, including patients prescribed insulin and/or exenatide.

**Supplemental Table S14.** Minimum hazard ratios for the association between the unmeasured confounder and each outcome that would case inference to change for each value of the prevalence difference from 0.02 to 0.20, in 0.02 increments and by data source.

**Supplemental Figure S1.** Selection of patients into each cohort within Medicare (**panel a**), the HealthCore Integrated Research DatabaseSM (HIRDSM; **panel b**), Clinical Practice Research Datalink (CPRD; **panel c**), and The Health Improvement Network (THIN; excluding CPRD; **panel d**).

**Supplemental Methods.** Statistical methods used to assess the effect of unmeasured confounding on the hazard ratios.

A sensitivity analysis was conducted to assess the effects of unmeasured confounders on the association between saxagliptin use and the main study endpoint. This sensitivity analysis estimated the degree of possible bias that may be present, assuming a plausible range of values for the parameters that quantify the degree of unmeasured confounding.1

To assess the impact that unmeasured confounding could have on the p-value of the hazard ratio, a previously established method by Lin et al1 was employed. This method begins by conceiving of a single, binary confounder, U, which is unmeasured (not included in our dataset). We evaluate a large set of observed confounders in the propensity score (PS), but in such an example, we consider one additional confounder, U, which is unmeasured. To assess the impact of unmeasured confounding, the degree to which this one variable could affect hazard ratios and p-values is investigated. To do this, first consider the following hypothetical Cox proportional hazards model that we would fit if U was available:

0(t)exp(X + U + PS)

where X denotes the indicator variable for saxagliptin, PS denotes the propensity score, 0(t) is the baseline hazard function, and , , and  are regression coefficients (parameters). The log-hazard ratio  is adjusted for all of the confounders: both U and the confounders that were included in the PS. The ratio of primary interest for the hazard ratio is exp(), because that represents the impact that saxagliptin use has on the hazard after controlling for all (both measured and unmeasured) confounders.

Because U is unmeasured, the model that we actually fit is:

0(t)exp(\*X + \*PS)

where \* and \* are the parameters estimated from the observed data. The stronger the unmeasured confounding, the larger the expected difference is between  and\*. If U is not a confounder (e.g., =0), then \*=. Thus, we estimate \* and assess how strong unmeasured confounding would have to be to change the conclusions from the observed results (i.e., how strong the confounding would have to be to make a statistically significant hazard ratio no longer significant, or a hazard ratio that is not statistically significant now significant).

Sensitivity analyses are based on varying the degree of unmeasured confounding. There are two aspects that impact the degree of unmeasured confounding: 1) the association between U and the outcome, and 2) the association between U and the treatment (X). The strength of the association between U and the outcome is quantified by the adjusted hazard ratio between U and the outcome (exp[. For example, exp()=1.5 implies that the presence of U (U=1) increases the hazard by 50%, compared with subjects for whom U=0, after controlling for all of the other confounders via the PS. To calculate the association between U and saxagliptin use, the prevalence of U (proportion of subjects with U=1) among saxagliptin users (P1) and other OAD users (P0) must be considered. The unmeasured confounder U is more strongly predictive of treatment when P1 and P0 are more different. By specifying , P0, and P1, can be related to \* using the following formula:

≅ \*-log

Thus, a point estimate or a lower or upper confident limit for \* can be used to calculate the corresponding value of 

For this analysis, we calculated the minimum (i.e., closest to 1) adjusted hazard ratio between U and the outcome (exp[]) that would change conclusions for each combination of P0 and P1. Because there were many plausible combinations of P0 and P1, we summarized the results by reporting the difference between P0 and P1 and the corresponding minimum hazard ratio necessary to change conclusions. Values of P1-P0 within the range of 0.02 to 0.20 (with increments of 0.02) were considered, whereby a value of 0.02, for example, assumes that there is a 2% difference in prevalence of U among saxagliptin initiators compared to other OADs initiators. We chose an upper limit of 0.20 because few observed confounders in our data set had a difference in prevalence that exceeded 0.20 (i.e., 20%).

If either a large hazard ratio or a large value of P1-P0 is necessary to change conclusions, then we would state that this inference is not very sensitive to departures from the assumption that there is no unmeasured confounding. Alternatively, if only weak confounding is required to change conclusions, then we cannot be confident in our primary results for that outcome.

**REFERENCES**

1. Lin DY, Psaty BM, Kronmal RA. Assessing the sensitivity of regression results to unmeasured confounders in observational studies. Biometrics. 1998;54(3):948-63.

**Supplemental Table S1.** Outcome codes and descriptions for the identification of major adverse cardiovascular events within the United States data sources.

| **CODE**  | **TYPE**  | **DESCRIPTION**  |
| --- | --- | --- |
| **ACUTE MYOCARDIAL INFARCTION** |
| 410  |  ICD9  | ACUTE MYOCARDIAL INFARCT (AMI)  |
| 410.0  |  ICD9  | AMI ANTEROLATERAL WALL  |
| 410.00  |  ICD9  | AMI ANTEROLATERAL, EPISODE OF CARE UNSPECIFIED  |
| 410.01  |  ICD9  | AMI ANTEROLATERAL, INITIAL EPISODE OF CARE  |
| 410.1  |  ICD9  | AMI ANTERIOR WALL NEC  |
| 410.10  |  ICD9  | AMI ANTERIOR WALL, EPISODE OF CARE UNSPECIFIED  |
| 410.11  |  ICD9  | AMI ANTERIOR WALL, INITIAL EPISODE OF CARE  |
| 410.2  |  ICD9  | AMI INFEROLATERAL WALL  |
| 410.20  |  ICD9  | AMI INFEROLATERAL, EPISODE OF CARE UNSPECIFIED  |
| 410.21  |  ICD9  | AMI INFEROLATERAL, INITIAL EPISODE OF CARE  |
| 410.3  |  ICD9  | AMI INFEROPOSTERIOR WALL  |
| 410.30  |  ICD9  | AMI INFEROPOST, EPISODE OF CARE UNSPECIFIED  |
| 410.31  |  ICD9  | AMI INFEROPOST, INITIAL EPISODE OF CARE  |
| 410.4  |  ICD9  | AMI INFERIOR WALL NEC  |
| 410.40  |  ICD9  | AMI INFERIOR WALL, EPISODE OF CARE UNSPECIFIED  |
| 410.41  |  ICD9  | AMI INFERIOR WALL, INITIAL EPISODE OF CARE  |
| 410.5  |  ICD9  | AMI LATERAL WALL NEC  |
| 410.50  |  ICD9  | AMI LATERAL NEC, EPISODE OF CARE UNSPECIFIED  |
| 410.51  |  ICD9  | AMI LATERAL NEC, INITIAL EPISODE OF CARE  |
| 410.6  |  ICD9  | TRUE POSTERIOR INFARCTION  |
| 410.60  |  ICD9  | TRUE POSTERIOR INFARCTION, EPISODE OF CARE UNSPECIFIED  |
| 410.61  |  ICD9  | TRUE POSTERIOR INFARCTION, INITIAL EPISODE OF CARE  |
| 410.7  |  ICD9  | SUBENDOCARDIAL INFARCTION  |
| 410.70  |  ICD9  | SUBENDOCARDIAL INFARCTION, EPISODE OF CARE UNSPECIFIED  |
| 410.71  |  ICD9  | SUBENDOCARDIAL INFARCTION, INITIAL  |
| 410.8  |  ICD9  | AMI, OTHER SPECIFIED SITES  |
| 410.80  |  ICD9  | AMI, OTHER SPECIFIED SITES, EPISODE OF CARE UNSPECIFIED  |
| 410.81  |  ICD9  | AMI, OTHER SPECIFIED SITES, INITIAL EPISODE OF CARE  |
| 410.9  |  ICD9  | MYOCARDIAL INFARCTION UNSPECIFIED SITE  |
| 410.90  |  ICD9  | AMI UNSPECIFIED SITE, EPISODE OF CARE UNSPECIFIED  |
| 410.91  |  ICD9  | AMI UNSPECIFIED SITE, INITIAL EPISODE OF CARE  |
| **ACUTE STROKE** |
| 431  |  ICD9  | INTRACEREBRAL HEMORRHAGE  |
| 432  |  ICD9  | OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE  |
| 432.9  |  ICD9  | INTRACRANIAL HEMORRHAGE NOS  |
| 433  |  ICD9  | PRECEREBRAL ARTERY OCCLUSION  |
| 433.0  |  ICD9  | BASILAR ARTERY OCCLUSION  |
| 433.00  |  ICD9  | BASILAR ARTERY OCCLUSION WO INFARCTION  |
| 433.01  |  ICD9  | BASILAR ARTERY OCCLUSION W INFARCTION  |
| 433.1  |  ICD9  | CAROTID ARTERY OCCLUSION  |
| 433.10  |  ICD9  | CAROTID ARTERY OCCLUSION WO INFARCTION  |
| 433.11  |  ICD9  | CAROTID ARTERY OCCLUSION W INFARCTION  |
| 433.2  |  ICD9  | VERTEBRAL ARTERY OCCLUSION  |
| 433.20  |  ICD9  | VERTEBRAL ARTERY OCCLUSION WO INFARCTION  |
| 433.21  |  ICD9  | VERTEBRAL ARTERY OCCLUSION W INFARCTION  |
| 433.3  |  ICD9  | MULTIPLE AND BILATERAL PRECEREBRAL ARTERY OCCLUSION  |
| 433.30  |  ICD9  | MULTIPLE AND BILATERAL PRECEREBRAL ARTERY OCCLUSION WO INFARCTION  |
| 433.31  |  ICD9  | MULTIPLE AND BILATERAL PRECEREBRAL ARTERY OCCLUSION W INFARCTION  |
| 433.8  |  ICD9  | PRECEREBRAL OCCLUSION NEC  |
| 433.80  |  ICD9  | PRECEREBRAL OCCLUSION OTHER PRECEREBRAL ARTERIES WO INFARCTION  |
| 433.81  |  ICD9  | PRECEREBRAL OCCLUSION OTHER PRECEREBRAL ARTERIES W INFARCTION  |
| 433.9  |  ICD9  | PRECEREBRAL OCCLUSION NOS  |
| 433.90  |  ICD9  | PRECEREBRAL OCCLUSION NOS WO INFARCTION  |
| 433.91  |  ICD9  | PRECEREBRAL OCCLUSION NOS W INFARCTION  |
| 434  |  ICD9  | CEREBRAL THROMBOSIS  |
| 434.0  |  ICD9  | CEREBRAL THROMBOSIS  |
| 434.00  |  ICD9  | CEREBRAL THROMBOSIS WO INFARCTION  |
| 434.01  |  ICD9  | CEREBRAL THROMBOSIS W INFARCTION  |
| 434.1  |  ICD9  | CEREBRAL EMBOLISM  |
| 434.10  |  ICD9  | CEREBRAL THROMBOSIS WO INFARCTION  |
| 434.11  |  ICD9  | CEREBRAL EMBOLISM W INFARCTION  |
| 434.9  |  ICD9  | CEREBRAL ARTERY OCCLUSION, UNSPECIFIED  |
| 434.90  |  ICD9  | CEREBRAL ARTERY OCCLUSION, UNSPECIFIED, W0 INFARCTION  |
| 434.91  |  ICD9  | CEREBRAL ARTERY OCCLUSION NOS WITH INFARCTION  |
| 436  |  ICD9  | CEREBROVASCULAR ACCIDENT  |
| **CORONARY AND CAROTID REVASCULARIZATION PROCEDURES** |
| 00.61 | ICD9\_px | PERCUTANEOUS ANGIOPLASTY OR ATHERECTOMY OF PRECEREBRAL (EXTRACRANIAL) VESSEL (S)  |
| 00.62 | ICD9\_px | PERCUTANEOUS ANGIOPLASTY OR ATHERECTOMY OF INTRACRANIAL VESSEL (S)  |
| 00.63 | ICD9\_px | PERCUTANEOUS INSERTION OF CAROTID ARTERY STENT (S)  |
| 00.66 | ICD9\_px | PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY [PTCA] OR CORONARY ATHERECTOMY |
| 36.03 | ICD9\_px | OPEN CHEST CORONRY ARTERY ANGIOPLASTY  |
| 36.04 | ICD9\_px | INTRACORONRY ARTERY THROMBOLYTIC INFUSION  |
| 36.06 | ICD9\_px | INSERTION OF NON-DRUG-ELUTING CORONARY ARTERY STENT  |
| 36.07 | ICD9\_px | INSERTION OF DRUG-ELUTING CORONARY ARTER STENT (S) |
| 36.09 | ICD9\_px | OTHER REMOVAL OF CORONARY ARTERY OBSTRUCTION  |
| 36.11 | ICD9\_px | AORTOCORONARY BYPASS- ONE CORONARY ARTERY  |
| 36.12 | ICD9\_px | AORTOCORONARY BYPASS-TWO CORONARY ARTERIES  |
| 36.13 | ICD9\_px | AORTOCORONARY BYPASS-THREE CORONARY ARTERIES  |
| 36.14 | ICD9\_px | AORTOCORONARY BYPASS-FOUR OR MORE CORONARY ARTERIES  |
| 36.15 | ICD9\_px | SINGLE INTERNAL MAMMARY-CORONARY ARTERY BYPASS  |
| 36.16 | ICD9\_px |  DOUBLE INTERNAL MAMMARY-CORONARY ARTERY BYPASS  |
| 36.17 | ICD9\_px | ABDOMINAL-CORONARY ARTERY BYPASS  |
| 36.19 | ICD9\_px | OTHER BYPASS ANASTOMOSIS FOR HEART REVASCULARIZATION  |
| 36.2 | ICD9\_px | ARTERIAL IMPLANT REVASC |
| 36.3 | ICD9\_px | OTHER HEART REVASCULARIZATION |
| 36.31 | ICD9\_px | OPEN CHEST TRANMYCARDIAL REVASCULARIZATION |
| 36.39 | ICD9\_px | OTHER HEART REVASCULARIZATION |
| 38.11 | ICD9\_px | INTRACRANIAL ENDARTERECTOMY |
| 38.12 | ICD9\_px | HEAD & NECK ENDARTERECTOMY NEC |
| 38.40  | ICD9\_px | RESECTION OF VESSEL WITH REPLACEMENT, UNSPECIFIED SITE |
| 39.28 | ICD9\_px | EXTRACRAN-INTRACR BYPASS |
| 33572 | CPT | CORONARY ENDARTERECTOMY, OPEN, ANY METHOD OF LEFT ANTERIOR DESCENDING, CIRCUMLEX, OR RIGHT CORONARY ARTERY PERFORMED IN CONJUNCTION WITH CORONARY ARTERY BYPASS GRAF PROCEDURE, EACH VESSEL |
| 35301 | CPT | THROMBOENDARTERECTOMY, INCLUDING PATCH GRAFT, IF PERFORMED; CAROTID, VERTEBRAL, SUBCLAVIAN, BY NECK INCISION |
| 35390 | CPT | REOPERATION, CAROTID, THROMBOENDARTERECTOMY, MORE THAN 1 MONTH AFTER ORIGINAL OPERATION |
| 35691 | CPT | TRANSPOSITION AND/OR REIMPLANTATION; VERTEBRAL TO CAROTID ARTERY |
| 35694 | CPT | TRANSPOSITION AND/OR REIMPLANTATION; SUBCLAVIAN TO CAROTID ARTERY |
| 35695 | CPT | TRANSPOSITION AND/OR REIMPLANTATION; CAROTID TO SUBCLAVIAN ARTERY |
| 92982 | CPT | PERCUTANEOUS TRANSLUMINAL CORONARY BALLOON ANGIOPLASTY |
| 92997 | CPT | PERCUTANEOUS TRANSLUMINAL PULMONARY ARTERY BALLOON ANGIOPLASTY; SINGLE VESSEL |
| **PULMONARY EMBOLISM AND DEEP VENOUS THROMBOSIS** |
| 415.1 | ICD9 | PULMONARY EMBOLISM AND INFARCTION |
| 415.11 | ICD9 | IATROGENIC PULMONARY EMBOLISM AND INFARCTION |
| 415.19 | ICD9 | OTHER PULMONARY EMBOLISM AND INFARCTION |
| 430.0 | ICD9 | BUDD-CHIARI SYNDROME |
| 451.1 | ICD9 | PHLEBITIS AND THROMBOPHLEBITIS OF DEEP VEINS OF LOWER EXTREMITIES |
| 451.11 | ICD9 | PHLEBITIS AND THROMBOPHLEBITIS OF FEMORAL VEIN (DEEP) (SUPERFICIAL) |
| 451.19 | ICD9 | PHLEBITIS AND THROMBOPHLEBITIS OF DEEP VEINS OF LOWER EXTREMITIES, OTHER |
| 451.2 | ICD9 | PHLEBITIS AND THROMBOPHLEBITIS OF LOWER EXTREMITIES, UNSPECIFIED |
| 451.8 | ICD9 | PHLEBITIS AND THROMBOPHLEBITIS OF OTHER SITES |
| 451.81 | ICD9 | PHLEBITIS AND THROMBOPHLEBITIS OF ILIAC VEIN |
| 451.89 | ICD9 | PHLEBITIS AND THROMBOPHLEBITIS OF OTHER SITES |
| 451.9 | ICD9 | PHLEBITIS AND THROMBOPHLEBITIS OF UNSPECIFIED SITE |
| 452 | ICD9 | PORTAL VEIN THROMBOSIS |
| 453.1 | ICD9 | THROMBOPHLEBITIS MIGRANS  |
| 453.2 | ICD9 | THROMBOSIS OF THE VENA CAVA  |
| 453.3 | ICD9 | EMBOLISM AND THROMBOSIS OF RENAL VEIN |
| 453.4 | ICD9 | ACUTE VENOUS EMBOLISM AND THROMBOSIS OF UNSPECIFIED DEEP VESSELS OF LOWER EXTREMITY |
| 453.41 | ICD9 | ACUTE VENOUS EMBOLISM AND THROMBOSIS OF DEEP VESSELS OF PROXIMAL LOWER EXTREMITY |
| 453.42 | ICD9 | ACUTE VENOUS EMBOLISM AND THROMBOSIS OF DEEP VESSELS OF DISTAL LOWER EXTREMITY |
| 453.6 | ICD9 | VENOUS EMBOLISM AND THROMBOSIS OF SUPERFICIAL VESSELS OF LOWER EXTREMITY |
| 453.8 | ICD9 | THROMBOSIS OF OTHER SPECIFIED VEINS |
| 453.84 | ICD9 | ACUTE VENOUS EMBOLISM AND THROMBOSIS OF AXILLARY VEINS |
| 453.85 | ICD9 | ACUTE VENOUS EMBOLISM AND THROMBOSIS OF SUBCLAVIAN VEINS |
| 453.86 | ICD9 | ACUTE VENOUS EMBOLISM AND THROMBOSIS OF INTERNAL JUGULAR VEINS |
| 453.87 | ICD9 | ACUTE VENOUS EMBOLISM AND THROMBOSIS OF OTHER THORACIC VEINS |
| 453.89 | ICD9 | ACUTE VENOUS EMBOLISM AND THROMBOSIS OF OTHER SPECIFIED VEINS |
| 453.9 | ICD9 | EMBOLISM AND THROMBOSIS OF UNSPECIFIED SITE |
| V12.55 | ICD9 | HX PULMONARY EMBOLISM |
| V1251 | ICD9 | HISTORY OF VENOUS THROMBOSIS AND EMBOLISM |
| 33910 | CPT | PULMONARY ARTERY EMBOLECTOMY; WITH CARDIOPULMONARY BYPASS |
| 33915 | CPT | PULMONARY ARTERY EMBOLECTOMY; WITHOUT CARDIOPULMONARY BYPASS |

**Supplemental Table S2:** Outcome codes and descriptions for the identification of major adverse cardiovascular events within the United Kingdom data sources.

|  **CODE**  |  **TYPE**  |  **DESCRIPTION**  |
| --- | --- | --- |
| **ACUTE MYOCARDIAL INFARCTION** |
| 323..00  | READ  | ECG: MYOCARDIAL INFARCTION  |
| 3233.00  | READ  | ECG: ANTERO-SEPTAL INFARCTION  |
| 3234.00  | READ  | ECG:POSTERIOR/INFERIOR INFARCTION  |
| 3235.00  | READ  | ECG: SUBENDOCARDIAL INFARCTION  |
| 3236.00  | READ  | ECG: LATERAL INFARCTION  |
| 323Z.00  | READ  | ECG: MYOCARDIAL INFARCTION NOS  |
| G30..00  | READ  | ACUTE MYOCARDIAL INFARCTION  |
| G30..11  | READ  | ATTACK-HEART  |
| G30..12  | READ  | CORONARY THROMBOSIS  |
| G30..13  | READ  | CARDIAC RUPTURE FOLLOWING MYOCARDIAL INFARCTION (MI)  |
| G30..14  | READ  | HEART ATTACK  |
| G30..15  | READ  | MI-ACUTE MYOCARDIAL INFARCTION  |
| G30..16  | READ  | THROMBOSIS-CORONARY  |
| G300.00  | READ  | ACUTE ANTEROLATERAL INFARCTION  |
| G301.00  | READ  | OTHER SPECIFIED ANTERIOR MYOCARDIAL INFARCTION  |
| G301000  | READ  | ACUTE ANTEROAPICAL INFARCTION  |
| G301100  | READ  | ACUTE ANTEROSEPTAL INFARCTION  |
| G301z00  | READ  | ANTERIOR MYOCARDIAL INFARCTION NOS  |
| G302.00  | READ  | ACUTE INFEROLATERAL INFARCTION  |
| G303.00  | READ  | ACUTE INFEROPOSTERIOR INFARCTION  |
| G304.00  | READ  | POSTERIOR MYOCARDIAL INFARCTION NOS  |
| G305.00  | READ  | LATERAL MYOCARDIAL INFARCTION NOS  |
| G306.00  | READ  | TRUE POSTERIOR MYOCARDIAL INFARCTION  |
| G307.00  | READ  | ACUTE SUBENDOCARDIAL INFARCTION  |
| G307000  | READ  | ACUTE NON-Q WAVE INFARCTION  |
| G307100  | READ  | ACUTE NON-ST SEGMENT ELEVATION MYOCARDIAL INFARCTION  |
| G308.00  | READ  | INFERIOR MYOCARDIAL INFARCTION NOS  |
| G309.00  | READ  | ACUTE Q-WAVE INFARCT  |
| G30B.00  | READ  | ACUTE POSTEROLATERAL MYOCARDIAL INFARCTION  |
| G30X.00  | READ  | ACUTE TRANSMURAL MYOCARDIAL INFARCTION OF UNSPECIFIED SITE  |
| G30X000  | READ  | ACUTE ST SEGMENT ELEVATION MYOCARDIAL INFARCTION  |
| G30y.00  | READ  | OTHER ACUTE MYOCARDIAL INFARCTION  |
| G30y000  | READ  | ACUTE ATRIAL INFARCTION  |
| G30y100  | READ  | ACUTE PAPILLARY MUSCLE INFARCTION  |
| G30y200  | READ  | ACUTE SEPTAL INFARCTION  |
| G30yz00  | READ  | OTHER ACUTE MYOCARDIAL INFARCTION NOS  |
| G30z.00  | READ  | ACUTE MYOCARDIAL INFARCTION NOS  |
| G31y100  | READ  | MICROINFARCTION OF HEART  |
| Gyu3400  | READ  | [X]ACUTE TRANSMURAL MYOCARDIAL INFARCTION OF UNSPECIFIED SITE  |
| **ACUTE STROKE** |
| G61..00  | READ  | INTRACEREBRAL HAEMORRHAGE  |
| G61..11  | READ  | CVA-CEREBROVASCULAR ACCID DUE TO INTRACEREBRAL HAEMORRHAGE  |
| G61..12  | READ  | STROKE DUE TO INTRACEREBRAL HAEMORRHAGE  |
| G610.00  | READ  | CORTICAL HAEMORRHAGE  |
| G611.00  | READ  | INTERNAL CAPSULE HAEMORRHAGE  |
| G612.00  | READ  | BASAL NUCLEUS HAEMORRHAGE  |
| G613.00  | READ  | CEREBELLAR HAEMORRHAGE  |
| G614.00  | READ  | PONTINE HAEMORRHAGE  |
| G615.00  | READ  | BULBAR HAEMORRHAGE  |
| G616.00  | READ  | EXTERNAL CAPSULE HAEMORRHAGE  |
| G617.00  | READ  | INTRACEREBRAL HAEMORRHAGE, INTRAVENTRICULAR  |
| G618.00  | READ  | INTRACEREBRAL HAEMORRHAGE, MULTIPLE LOCALIZED  |
| G61X.00  | READ  | INTRACEREBRAL HAEMORRHAGE IN HEMISPHERE, UNSPECIFIED  |
| G61X000  | READ  | LEFT SIDED INTRACEREBRAL HAEMORRHAGE, UNSPECIFIED  |
| G61X100  | READ  | RIGHT SIDED INTRACEREBRAL HAEMORRHAGE, UNSPECIFIED  |
| G61z.00  | READ  | INTRACEREBRAL HAEMORRHAGE NOS  |
| G63..11  | READ  | INFARCTION-PRECEREBRAL  |
| G631.12  | READ  | THROMBOSIS, CAROTID ARTERY  |
| G63y000  | READ  | CEREBRAL INFARCT DUE TO THROMBOSIS OF PRECEREBRAL ARTERIES  |
| G64..11  | READ  | CEREBROVASCULAR ACCIDENT-CEREBRAL ARTERY OCCLUSION  |
| G64..12  | READ  | INFARCTION-CEREBRAL  |
| G64..13  | READ  | STROKE DUE TO CEREBRAL ARTERIAL OCCLUSION  |
| G640.00  | READ  | CEREBRAL THROMBOSIS  |
| G640000  | READ  | CEREBRAL INFARCTION DUE TO THROMBOSIS OF CEREBRAL ARTERIES  |
| G64z.00  | READ  | CEREBRAL INFARCTION NOS  |
| G64z200  | READ  | LEFT SIDED CEREBRAL INFARCTION  |
| G64z300  | READ  | RIGHT SIDED CEREBRAL INFARCTION  |
| G66..00  | READ  | STROKE AND CEREBROVASCULAR ACCIDENT UNSPECIFIED  |
| G66..11  | READ  | CEREBROVASCULAR ACCIDENT UNSPECIFIED  |
| G66..12  | READ  | STROKE UNSPECIFIED  |
| G66..13  | READ  | CEREBROVASCULAR ACCIDENT-CEREBROVASCULAR ACCIDENT UNSPECIFIED  |
| G667.00  | READ  | LEFT SIDED CEREBROVASCULAR ACCIDENT  |
| G668.00  | READ  | RIGHT SIDED CEREBROVASCULAR ACCIDENT  |
| G6W..00  | READ  | CEREBRAL INFARCTION-UNSPEC OCCLUSION/STENOSIS, PRECEREBRAL ARTERIES  |
| G6X..00  | READ  | CEREBRL INFARCTION-UNSPEC OCCLUSION/STENOSIS, CEREBRAL ARTERRIES  |
| Gyu6200  | READ  | [X]OTHER INTRACEREBRAL HAEMORRHAGE  |
| Gyu6300  | READ  | [X]CEREBRL INFARCTIONN-UNSPEC OCCLUSION/STEN, CEREBRAL ARTERIES  |
| Gyu6400  | READ  | [X]OTHER CEREBRAL INFARCTION  |
| Gyu6500  | READ  | [X]OCCLUSION AND STENOSIS OF OTHER PRECEREBRAL ARTERIES  |
| Gyu6600  | READ  | [X]OCCLUSION AND STENOSIS OF OTHER CEREBRAL ARTERIES  |
| Gyu6E00  | READ  | [X]SUBARACHNOID HAEMORRHAGE FROM INTRACRANIAL ARTERY, UNSPECIF  |
| Gyu6F00  | READ  | [X]INTRACEREBRAL HAEMORRHAGE IN HEMISPHERE, UNSPECIFIED  |
| Gyu6G00  | READ  | [X]CEREB INFARCT DUE UNSP OCCLUS/STENOS PRECEREBR ARTERIES  |
| G31y.00  | READ  | OTHER ACUTE AND SUBACUTE ISCHAEMIC HEART DISEASE  |
| 9h21.00 | READ | EXCEPTED FROM STROKE QUALITY INDICATORS: PATIENT UNSUITABLE |
| 9h22.00 | READ | EXCEPTED FROM STROKE QUALITY INDICATORS: INFORMED DISSENT |
| **CORONARY AND CAROTID REVASCULARIZATION PROCEDURES** |
| 792..00  | READ  | CORONARY ARTERY OPERATIONS  |
| 792..11  | READ  | CORONARY ARTERY BYPASS GRAFT OPERATIONS  |
| 7920.00  | READ  | SAPHENOUS VEIN GRAFT REPLACEMENT OF CORONARY ARTERY  |
| 7920.11  | READ  | SAPHENOUS VEIN GRAFT BYPASS OF CORONARY ARTERY  |
| 7920000  | READ  | SAPHENOUS VEIN GRAFT REPLACEMENT OF ONE CORONARY ARTERY  |
| 7920100  | READ  | SAPHENOUS VEIN GRAFT REPLACEMENT OF TWO CORONARY ARTERIES  |
| 7920200  | READ  | SAPHENOUS VEIN GRAFT REPLACEMENT OF THREE CORONARY ARTERIES  |
| 7920300  | READ  | SAPHENOUS VEIN GRAFT REPLACEMENT OF FOUR+ CORONARY ARTERIES  |
| 7920y00  | READ  | SAPHENOUS VEIN GRAFT REPLACEMENT OF CORONARY ARTERY OS  |
| 7920z00  | READ  | SAPHENOUS VEIN GRAFT REPLACEMENT CORONARY ARTERY NOS  |
| 7921.00  | READ  | OTHER AUTOGRAFT REPLACEMENT OF CORONARY ARTERY  |
| 7921.11  | READ  | OTHER AUTOGRAFT BYPASS OF CORONARY ARTERY  |
| 7921000  | READ  | AUTOGRAFT REPLACEMENT OF ONE CORONARY ARTERY NEC  |
| 7921100  | READ  | AUTOGRAFT REPLACEMENT OF TWO CORONARY ARTERIES NEC  |
| 7921200  | READ  | AUTOGRAFT REPLACEMENT OF THREE CORONARY ARTERIES NEC  |
| 7921300  | READ  | AUTOGRAFT REPLACEMENT OF FOUR OF MORE CORONARY ARTERIES NEC  |
| 7921y00  | READ  | OTHER AUTOGRAFT REPLACEMENT OF CORONARY ARTERY OS  |
| 7921z00  | READ  | OTHER AUTOGRAFT REPLACEMENT OF CORONARY ARTERY NOS  |
| 7922.00  | READ  | ALLOGRAFT REPLACEMENT OF CORONARY ARTERY  |
| 7922.11  | READ  | ALLOGRAFT BYPASS OF CORONARY ARTERY  |
| 7922000  | READ  | ALLOGRAFT REPLACEMENT OF ONE CORONARY ARTERY  |
| 7922100  | READ  | ALLOGRAFT REPLACEMENT OF TWO CORONARY ARTERIES  |
| 7922200  | READ  | ALLOGRAFT REPLACEMENT OF THREE CORONARY ARTERIES  |
| 7922300  | READ  | ALLOGRAFT REPLACEMENT OF FOUR OR MORE CORONARY ARTERIES  |
| 7922y00  | READ  | OTHER SPECIFIED ALLOGRAFT REPLACEMENT OF CORONARY ARTERY  |
| 7922z00  | READ  | ALLOGRAFT REPLACEMENT OF CORONARY ARTERY NOS  |
| 7923.00  | READ  | PROSTHETIC REPLACEMENT OF CORONARY ARTERY  |
| 7923.11  | READ  | PROSTHETIC BYPASS OF CORONARY ARTERY  |
| 7923000  | READ  | PROSTHETIC REPLACEMENT OF ONE CORONARY ARTERY  |
| 7923100  | READ  | PROSTHETIC REPLACEMENT OF TWO CORONARY ARTERIES  |
| 7923200  | READ  | PROSTHETIC REPLACEMENT OF THREE CORONARY ARTERIES  |
| 7923300  | READ  | PROSTHETIC REPLACEMENT OF FOUR OR MORE CORONARY ARTERIES  |
| 7923y00  | READ  | OTHER SPECIFIED PROSTHETIC REPLACEMENT OF CORONARY ARTERY  |
| 7923z00  | READ  | PROSTHETIC REPLACEMENT OF CORONARY ARTERY NOS  |
| 7924.00  | READ  | REVISION OF BYPASS FOR CORONARY ARTERY  |
| 7924000  | READ  | REVISION OF BYPASS FOR ONE CORONARY ARTERY  |
| 7924100  | READ  | REVISION OF BYPASS FOR TWO CORONARY ARTERIES  |
| 7924200  | READ  | REVISION OF BYPASS FOR THREE CORONARY ARTERIES  |
| 7924300  | READ  | REVISION OF BYPASS FOR FOUR OR MORE CORONARY ARTERIES  |
| 7924400  | READ  | REVISION OF CONNECTION OF THORACIC ARTERY TO CORONARY ARTERY  |
| 7924500  | READ  | REVISION OF IMPLANTATION OF THORACIC ARTERY INTO HEART  |
| 7924y00  | READ  | OTHER SPECIFIED REVISION OF BYPASS FOR CORONARY ARTERY  |
| 7924z00  | READ  | REVISION OF BYPASS FOR CORONARY ARTERY NOS  |
| 7925.00  | READ  | CONNECTION OF MAMMARY ARTERY TO CORONARY ARTERY  |
| 7925.11  | READ  | CREATION OF BYPASS FROM MAMMARY ARTERY TO CORONARY ARTERY  |
| 7925000  | READ  | DOUBLE ANASTOMOSIS OF MAMMARY ARTERIES TO CORONARY ARTERIES  |
| 7925011  | READ  | LIMA SEQUENTIAL ANASTOMOSIS  |
| 7925012  | READ  | RIMA SEQUENTIAL ANASTOMOSIS  |
| 7925100  | READ  | DOUBLE IMPLANT OF MAMMARY ARTERIES INTO CORONARY ARTERIES  |
| 7925200  | READ  | SINGLE ANAST MAMMARY ART TO LEFT ANT DESCEND CORONARY ART  |
| 7925300  | READ  | SINGLE ANASTOMOSIS OF MAMMARY ARTERY TO CORONARY ARTERY NEC  |
| 7925311  | READ  | LIMA SINGLE ANASTOMOSIS  |
| 7925312  | READ  | RIMA SINGLE ANASTOMOSIS  |
| 7925400  | READ  | SINGLE IMPLANTATION OF MAMMARY ARTERY INTO CORONARY ARTERY  |
| 7925y00  | READ  | CONNECTION OF MAMMARY ARTERY TO CORONARY ARTERY OS  |
| 7925z00  | READ  | CONNECTION OF MAMMARY ARTERY TO CORONARY ARTERY NOS  |
| 7926.00  | READ  | CONNECTION OF OTHER THORACIC ARTERY TO CORONARY ARTERY  |
| 7926000  | READ  | DOUBLE ANASTOM THORACIC ARTERIES TO CORONARY ARTERIES NEC  |
| 7926100  | READ  | DOUBLE IMPLANT THORACIC ARTERIES INTO CORONARY ARTERIES NEC  |
| 7926200  | READ  | SINGLE ANASTOMOSIS OF THORACIC ARTERY TO CORONARY ARTERY NEC  |
| 7926300  | READ  | SINGLE IMPLANTATION THORACIC ARTERY INTO CORONARY ARTERY NEC  |
| 7926y00  | READ  | CONNECTION OF OTHER THORACIC ARTERY TO CORONARY ARTERY OS  |
| 7926z00  | READ  | CONNECTION OF OTHER THORACIC ARTERY TO CORONARY ARTERY NOS  |
| 7927.00  | READ  | OTHER OPEN OPERATIONS ON CORONARY ARTERY  |
| 7927200  | READ  | TRANSECTION OF MUSCLE BRIDGE OF CORONARY ARTERY  |
| 7927300  | READ  | TRANSPOSITION OF CORONARY ARTERY NEC  |
| 7927y00  | READ  | OTHER SPECIFIED OTHER OPEN OPERATION ON CORONARY ARTERY  |
| 7927z00  | READ  | OTHER OPEN OPERATION ON CORONARY ARTERY NOS  |
| 792B.00  | READ  | REPAIR OF CORONARY ARTERY NEC  |
| 792C.00  | READ  | OTHER REPLACEMENT OF CORONARY ARTERY  |
| 792C000  | READ  | REPLACEMENT OF CORONARY ARTERIES USING MULTIPLE METHODS  |
| 792Cy00  | READ  | OTHER SPECIFIED REPLACEMENT OF CORONARY ARTERY  |
| 792Cz00  | READ  | REPLACEMENT OF CORONARY ARTERY NOS  |
| 792D.00  | READ  | OTHER BYPASS OF CORONARY ARTERY  |
| 792Dy00  | READ  | OTHER SPECIFIED OTHER BYPASS OF CORONARY ARTERY  |
| 792Dz00  | READ  | OTHER BYPASS OF CORONARY ARTERY NOS  |
| 792y.00  | READ  | OTHER SPECIFIED OPERATIONS ON CORONARY ARTERY  |
| SP00300  | READ  | MECHANICAL COMPLICATION OF CORONARY BYPASS  |
| 7927000  | READ  | REPAIR OF ARTERIOVENOUS FISTULA OF CORONARY ARTERY  |
| 7927100  | READ  | REPAIR OF ANEURYSM OF CORONARY ARTERY  |
| 7927400  | READ  | EXPLORATION OF CORONARY ARTERY  |
| 7927500  | READ  | OPEN ANGIOPLASTY OF CORONARY ARTERY  |
| 7928.00  | READ  | TRANSLUMINAL BALLOON ANGIOPLASTY OF CORONARY ARTERY  |
| 7928.11  | READ  | PERCUTANEOUS BALLOON CORONARY ANGIOPLASTY  |
| 7928000  | READ  | PERCUT TRANSLUMINAL BALLOON ANGIOPLASTY ONE CORONARY ARTERY  |
| 7928100  | READ  | PERCUT TRANSLUM BALLOON ANGIOPLASTY MULT CORONARY ARTERIES  |
| 7928200  | READ  | PERCUT TRANSLUM BALLOON ANGIOPLASTY BYPASS GRAFT CORONARY ARTERT  |
| 7928300  | READ  | PERCUT TRANSLUM CUTTING BALLOON ANGIOPLASTY CORONARY ARTERY  |
| 7928y00  | READ  | TRANSLUMINAL BALLOON ANGIOPLASTY OF CORONARY ARTERY OS  |
| 7928z00  | READ  | TRANSLUMINAL BALLOON ANGIOPLASTY OF CORONARY ARTERY NOS  |
| 7929.00  | READ  | OTHER THERAPEUTIC TRANSLUMINAL OPERATIONS ON CORONARY ARTERY  |
| 7929000  | READ  | PERCUTANEOUS TRANSLUMINAL LASER CORONARY ANGIOPLASTY  |
| 7929100  | READ  | PERCUTANEOUS TRANSLUMINAL CORONARY THROMBOLYSIS W STREPTOKINASE  |
| 7929111  | READ  | PERCUTAN. TRANSLUM. CORONARY THROMBOLYTIC THERAPY, STREPTOKINASE  |
| 7929200  | READ  | PERCUTAN. TRANSLUM. INJECT THERAP SUBST TO CORONARY ARTERY NEC  |
| 7929300  | READ  | ROTARY BLADE CORONARY ANGIOPLASTY  |
| 7929400  | READ  | INSERTION OF CORONARY ARTERY STENT  |
| 7929500  | READ  | INSERTION OF DRUG-ELUTING CORONARY ARTERY STENT  |
| 7929600  | READ  | PERCUTANEOUS TRANSLUMINAL ATHERECTOMY OF CORONARY ARTERY  |
| 7929y00  | READ  | OTHER THERAPEUTIC TRANSLUMINAL OP ON CORONARY ARTERY OS  |
| 7929z00  | READ  | OTHER THERAPEUTIC TRANSLUMINAL OP ON CORONARY ARTERY NOS  |
| 792A.00  | READ  | DIAGNOSTIC TRANSLUMINAL OPERATIONS ON CORONARY ARTERY  |
| 792A000  | READ  | PERCUTANEOUS TRANSLUMINAL ANGIOSCOPY  |
| 792B000  | READ  | ENDARTERECTOMY OF CORONARY ARTERY NEC  |
| 792B100  | READ  | REPAIR OF RUPTURE OF CORONARY ARTERY  |
| 792By00  | READ  | OTHER SPECIFIED REPAIR OF CORONARY ARTERY  |
| 792Bz00  | READ  | REPAIR OF CORONARY ARTERY NOS  |
| 792z.00  | READ  | CORONARY ARTERY OPERATIONS NOS  |
| 7A1A000  | READ  | PERCUTANEOUS TRANSLUMINAL BALLOON ANGIOPLASTY OF AORTA  |
| 7A54000  | READ  | PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY OF ARTERY NEC  |
| 7A6G100  | READ  | PEROPERATIVE ANGIOPLASTY  |
| SP01200  | READ  | MECHANICAL COMPLICATION OF CAROTID ARTERY BYPASS  |
| 7A20.00  | READ  | RECONSTRUCTION OF CAROTID ARTERY  |
| 7A20000  | READ  | REPLACEMENT OF CAROTID ARTERY USING GRAFT  |
| 7A20100  | READ  | INTRACRANIAL BYPASS TO CAROTID ARTERY  |
| 7A20200  | READ  | BYPASS TO CAROTID ARTERY NEC  |
| 7A20300  | READ  | ENDARTERECTOMY AND PATCH REPAIR OF CAROTID ARTERY  |
| 7A20311  | READ  | CAROTID ENDARTERECTOMY AND PATCH  |
| 7A20400  | READ  | ENDARTERECTOMY OF CAROTID ARTERY NEC  |
| 7A20500  | READ  | HIGH-FLOW INTER EXTRAC INTRAC BYP EXT CAROT ART MID CER ART  |
| 7A20600  | READ  | BYP CAROT ART ANASTOM SUPERFIC TEMPOR ARTERY MIDDLE CERE ART  |
| 7A20700  | READ  | INTRACRANIAL BYPASS FROM CAROTID ARTERY NEC  |
| 7A20y00  | READ  | OTHER SPECIFIED RECONSTRUCTION OF CAROTID ARTERY  |
| 7A20z00  | READ  | RECONSTRUCTION OF CAROTID ARTERY NOS  |
| 7A22.00  | READ  | TRANSLUMINAL OPERATIONS ON CAROTID ARTERY  |
| 7A22000  | READ  | PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY OF CAROTID ARTERY  |
| 7A22100  | READ  | ARTERIOGRAPHY OF CAROTID ARTERY  |
| 7A22200  | READ  | ENDOVASCULAR REPAIR OF CAROTID ARTERY  |
| 7A22300  | READ  | PERCUTANEOUS TRANSLUMINAL INSERTION STENT CAROTID ARTERY  |
| 7A22y00  | READ  | OTHER SPECIFIED TRANSLUMINAL OPERATION ON CAROTID ARTERY  |
| 7A22z00  | READ  | TRANSLUMINAL OPERATION ON CAROTID ARTERY NOS  |
| **PULMONARY EMBOLISM AND DEEP VENOUS THROMBOSIS** |
| G40..00 | READ | ACUTE PULMONARY HEART DISEASE |
| G400.00 | READ | ACUTE COR PULMONALE |
| G401.00 | READ | PULMONARY EMBOLISM |
| G401.11 | READ | INFARCTION-PULMONARY |
| G401.12 | READ | PULMONARY EMBOLUS |
| G401000 | READ | POST OPERATIVE PULMONARY EMBOLUS |
| G401100 | READ | RECURRENT PULMONARY EMBOLISM |
| G402.00 | READ | PULMONARY INFARCT |
| G40z.00 | READ | ACUTE PULMONARY HEART DISEASE NOS |
| G8...00 | READ | VEIN, LYMPHATIC AND CIRCULATORY DISEASES NOS |
| G80..00 | READ | PHLEBITIS AND THROMBOPHLEBITIS |
| G801.00 | READ | DEEP VEIN PHLEBITIS AND THROMBOPHLEBITIS OF THE LEG |
| G801.11 | READ | DEEP VEIN THROMBOSIS |
| G801.12 | READ | DEEP VEIN THROMBOSIS, LEG |
| G801.13 | READ | DVT-DEEP VEIN THROMBOSIS |
| G801000 | READ | PHLEBITIS OF THE FEMORAL VEIN |
| G801100 | READ | PHLEBITIS OF THE POPLITEAL VEIN |
| G801200 | READ | PHLEBITIS OF THE ANTERIOR TIBIAL VEIN |
| G801300 | READ | PHLEBITIS OF THE DORSALIS PEDIS VEIN |
| G801400 | READ | PHLEBITIS OF THE POSTERIOR TIBIAL VEIN |
| G801500 | READ | DEEP VEIN PHLEBITIS OF THE LEG UNSPECIFIED |
| G801600 | READ | THROMBOPHLEBITIS OF THE FEMORAL VEIN |
| G801700 | READ | THROMBOPHLEBITIS OF THE POPLITEAL VEIN |
| G801800 | READ | THROMBOPHLEBITIS OF THE ANTERIOR TIBIAL VEIN |
| G801900 | READ | THROMBOPHLEBITIS OF THE DORSALIS PEDIS VEIN |
| G801A00 | READ | THROMBOPHLEBITIS OF THE POSTERIOR TIBIAL VEIN |
| G801B00 | READ | DEEP VEIN THROMBOPHLEBITIS OF THE LEG UNSPECIFIED |
| G801C00 | READ | DEEP VEIN THROMBOSIS OF LEG RELATED TO AIR TRAVEL |
| G801D00 | READ | DEEP VEIN THROMBOSIS OF LOWER LIMB |
| G801E00 | READ | DEEP VEIN THROMBOSIS OF LEG RELATED TO INTRAVENOUS DRUG USE |
| G801F00 | READ | DEEP VEIN THROMBOSIS OF PERONEAL VEIN |
| G801z00 | READ | DEEP VEIN PHLEBITIS AND THROMBOPHLEBITIS OF THE LEG NOS |
| G802.00 | READ | PHLEBITIS AND THROMBOPHLEBITIS OF THE LEG NOS |
| G802000 | READ | THROMBOSIS OF VEIN OF LEG |
| G80y.00 | READ | OTHER PHLEBITIS AND THROMBOPHLEBITIS |
| G80y.11 | READ | PHLEBITIS AND/OR THROMBOPHLEBITIS OF ILIAC VEIN |
| G80y000 | READ | PHLEBITIS OF THE COMMON ILIAC VEIN |
| G80y100 | READ | PHLEBITIS OF THE INTERNAL ILIAC VEIN |
| G80y200 | READ | PHLEBITIS OF THE EXTERNAL ILIAC VEIN |
| G80y300 | READ | PHLEBITIS OF THE ILIAC VEIN UNSPECIFIED |
| G80y400 | READ | THROMBOPHLEBITIS OF THE COMMON ILIAC VEIN |
| G80y500 | READ | THROMBOPHLEBITIS OF THE INTERNAL ILIAC VEIN |
| G80y600 | READ | THROMBOPHLEBITIS OF THE EXTERNAL ILIAC VEIN |
| G80y700 | READ | THROMBOPHLEBITIS OF THE ILIAC VEIN UNSPECIFIED |
| G80y800 | READ | PHLEBITIS AND THROMBOPHLEBITIS OF THE ILIAC VEIN NOS |
| G80y900 | READ | THROMBOPHLEBITIS OF THE BREAST-MONDOR'S DISEASE |
| G80y911 | READ | MONDOR'S DISEASE |
| G80yz00 | READ | OTHER PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z.00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z000 | READ | PHLEBITIS NOS |
| G80z100 | READ | THROMBOPHLEBITIS NOS |
| G80zz00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G81..00 | READ | PORTAL VEIN THROMBOSIS |
| G82..00 | READ | OTHER VENOUS EMBOLISM AND THROMBOSIS |
| G820.00 | READ | BUDD-CHIARI SYNDROME (HEPATIC VEIN THROMBOSIS) |
| G820.11 | READ | HEPATIC VEIN THROMBOSIS |
| G820.12 | READ | STUART-BRASS SYNDROME |
| G821.00 | READ | THROMBOPHLEBITIS MIGRANS |
| G822.00 | READ | EMBOLISM AND THROMBOSIS OF THE VENA CAVA |
| G822000 | READ | THROMBOSIS INFERIOR VENA CAVA |
| G823.00 | READ | EMBOLISM AND THROMBOSIS OF THE RENAL VEIN |
| G824.00 | READ | AXILLARY VEIN THROMBOSIS |
| G82y.00 | READ | OTHER EMBOLISM AND THROMBOSIS |
| G82z.00 | READ | EMBOLISM AND THROMBOSIS NOS |
| G82z000 | READ | EMBOLUS OF VEIN NOS |
| G82z011 | READ | EMBOLISM OF VEIN NOS |
| G82z100 | READ | THROMBOSIS OF VEIN NOS |
| G82z111 | READ | PENIS VEIN THROMBOSIS |
| G82zz00 | READ | EMBOLISM AND THROMBOSIS NOS |
| Gyu8.00 | READ | [X]DISEASES OF VEINS, LYMPHATIC VESSELS & LYMPH NODES, NEC |
| Gyu8000 | READ | [X]PHLEBITIS+THROMBOPHLEBITIS/OTH DEEP VESSLS/LOW EXTREMITES |
| Gyu8100 | READ | [X]PHLEBITIS AND THOMBOPHLEBITIS OF OTHER SITES |
| Gyu8200 | READ | [X]EMBOLISM AND THROMBOSIS OF OTHER SPECIFIED VEINS |
| SP12200 | READ | POST OPERATIVE DEEP VEIN THROMBOSIS |
| G40..00 | READ | ACUTE PULMONARY HEART DISEASE |
| G400.00 | READ | ACUTE COR PULMONALE |
| G401.00 | READ | PULMONARY EMBOLISM |
| G401.11 | READ | INFARCTION-PULMONARY |
| G401.12 | READ | PULMONARY EMBOLUS |
| G401000 | READ | POST OPERATIVE PULMONARY EMBOLUS |
| G401100 | READ | RECURRENT PULMONARY EMBOLISM |
| G402.00 | READ | PULMONARY INFARCT |
| G40z.00 | READ | ACUTE PULMONARY HEART DISEASE NOS |
| G8...00 | READ | VEIN, LYMPHATIC AND CIRCULATORY DISEASES NOS |
| G80..00 | READ | PHLEBITIS AND THROMBOPHLEBITIS |
| G801.00 | READ | DEEP VEIN PHLEBITIS AND THROMBOPHLEBITIS OF THE LEG |
| G801.11 | READ | DEEP VEIN THROMBOSIS |
| G801.12 | READ | DEEP VEIN THROMBOSIS, LEG |
| G801.13 | READ | DVT-DEEP VEIN THROMBOSIS |
| G801000 | READ | PHLEBITIS OF THE FEMORAL VEIN |
| G801100 | READ | PHLEBITIS OF THE POPLITEAL VEIN |
| G801200 | READ | PHLEBITIS OF THE ANTERIOR TIBIAL VEIN |
| G801300 | READ | PHLEBITIS OF THE DORSALIS PEDIS VEIN |
| G801400 | READ | PHLEBITIS OF THE POSTERIOR TIBIAL VEIN |
| G801500 | READ | DEEP VEIN PHLEBITIS OF THE LEG UNSPECIFIED |
| G801600 | READ | THROMBOPHLEBITIS OF THE FEMORAL VEIN |
| G801700 | READ | THROMBOPHLEBITIS OF THE POPLITEAL VEIN |
| G801800 | READ | THROMBOPHLEBITIS OF THE ANTERIOR TIBIAL VEIN |
| G801900 | READ | THROMBOPHLEBITIS OF THE DORSALIS PEDIS VEIN |
| G801A00 | READ | THROMBOPHLEBITIS OF THE POSTERIOR TIBIAL VEIN |
| G801B00 | READ | DEEP VEIN THROMBOPHLEBITIS OF THE LEG UNSPECIFIED |
| G801C00 | READ | DEEP VEIN THROMBOSIS OF LEG RELATED TO AIR TRAVEL |
| G801D00 | READ | DEEP VEIN THROMBOSIS OF LOWER LIMB |
| G801E00 | READ | DEEP VEIN THROMBOSIS OF LEG RELATED TO INTRAVENOUS DRUG USE |
| G801F00 | READ | DEEP VEIN THROMBOSIS OF PERONEAL VEIN |
| G801z00 | READ | DEEP VEIN PHLEBITIS AND THROMBOPHLEBITIS OF THE LEG NOS |
| G802.00 | READ | PHLEBITIS AND THROMBOPHLEBITIS OF THE LEG NOS |
| G802000 | READ | THROMBOSIS OF VEIN OF LEG |
| G80y.00 | READ | OTHER PHLEBITIS AND THROMBOPHLEBITIS |
| G80y.11 | READ | PHLEBITIS AND/OR THROMBOPHLEBITIS OF ILIAC VEIN |
| G80y000 | READ | PHLEBITIS OF THE COMMON ILIAC VEIN |
| G80y100 | READ | PHLEBITIS OF THE INTERNAL ILIAC VEIN |
| G80y200 | READ | PHLEBITIS OF THE EXTERNAL ILIAC VEIN |
| G80y300 | READ | PHLEBITIS OF THE ILIAC VEIN UNSPECIFIED |
| G80y400 | READ | THROMBOPHLEBITIS OF THE COMMON ILIAC VEIN |
| G80y500 | READ | THROMBOPHLEBITIS OF THE INTERNAL ILIAC VEIN |
| G80y600 | READ | THROMBOPHLEBITIS OF THE EXTERNAL ILIAC VEIN |
| G80y700 | READ | THROMBOPHLEBITIS OF THE ILIAC VEIN UNSPECIFIED |
| G80y800 | READ | PHLEBITIS AND THROMBOPHLEBITIS OF THE ILIAC VEIN NOS |
| G80y900 | READ | THROMBOPHLEBITIS OF THE BREAST-MONDOR'S DISEASE |
| G80y911 | READ | MONDOR'S DISEASE |
| G80yz00 | READ | OTHER PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z.00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z000 | READ | PHLEBITIS NOS |
| G80z100 | READ | THROMBOPHLEBITIS NOS |
| G80zz00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G81..00 | READ | PORTAL VEIN THROMBOSIS |
| G82..00 | READ | OTHER VENOUS EMBOLISM AND THROMBOSIS |
| G820.00 | READ | BUDD-CHIARI SYNDROME (HEPATIC VEIN THROMBOSIS) |
| G820.11 | READ | HEPATIC VEIN THROMBOSIS |
| G820.12 | READ | STUART-BRASS SYNDROME |
| G821.00 | READ | THROMBOPHLEBITIS MIGRANS |
| G822.00 | READ | EMBOLISM AND THROMBOSIS OF THE VENA CAVA |
| G822000 | READ | THROMBOSIS INFERIOR VENA CAVA |
| G823.00 | READ | EMBOLISM AND THROMBOSIS OF THE RENAL VEIN |
| G824.00 | READ | AXILLARY VEIN THROMBOSIS |
| G82y.00 | READ | OTHER EMBOLISM AND THROMBOSIS |
| G82z.00 | READ | EMBOLISM AND THROMBOSIS NOS |
| G82z000 | READ | EMBOLUS OF VEIN NOS |
| G82z011 | READ | EMBOLISM OF VEIN NOS |
| G82z100 | READ | THROMBOSIS OF VEIN NOS |
| G82z111 | READ | PENIS VEIN THROMBOSIS |
| G82zz00 | READ | EMBOLISM AND THROMBOSIS NOS |
| Gyu8.00 | READ | [X]DISEASES OF VEINS, LYMPHATIC VESSELS & LYMPH NODES, NEC |
| Gyu8000 | READ | [X]PHLEBITIS+THROMBOPHLEBITIS/OTH DEEP VESSLS/LOW EXTREMITES |
| Gyu8100 | READ | [X]PHLEBITIS AND THOMBOPHLEBITIS OF OTHER SITES |
| Gyu8200 | READ | [X]EMBOLISM AND THROMBOSIS OF OTHER SPECIFIED VEINS |
| SP12200 | READ | POST OPERATIVE DEEP VEIN THROMBOSIS |
| G80y900 | READ | THROMBOPHLEBITIS OF THE BREAST-MONDOR'S DISEASE |
| G80y911 | READ | MONDOR'S DISEASE |
| G80yz00 | READ | OTHER PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z.00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z000 | READ | PHLEBITIS NOS |
| G80z100 | READ | THROMBOPHLEBITIS NOS |
| G80zz00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G81..00 | READ | PORTAL VEIN THROMBOSIS |
| G82..00 | READ | OTHER VENOUS EMBOLISM AND THROMBOSIS |
| G820.00 | READ | BUDD-CHIARI SYNDROME (HEPATIC VEIN THROMBOSIS) |
| G820.11 | READ | HEPATIC VEIN THROMBOSIS |
| G820.12 | READ | STUART-BRASS SYNDROME |
| G821.00 | READ | THROMBOPHLEBITIS MIGRANS |
| G822.00 | READ | EMBOLISM AND THROMBOSIS OF THE VENA CAVA |
| G822000 | READ | THROMBOSIS INFERIOR VENA CAVA |
| G823.00 | READ | EMBOLISM AND THROMBOSIS OF THE RENAL VEIN |
| G824.00 | READ | AXILLARY VEIN THROMBOSIS |
| G82y.00 | READ | OTHER EMBOLISM AND THROMBOSIS |
| G82z.00 | READ | EMBOLISM AND THROMBOSIS NOS |
| G82z000 | READ | EMBOLUS OF VEIN NOS |
| G82z011 | READ | EMBOLISM OF VEIN NOS |
| G82z100 | READ | THROMBOSIS OF VEIN NOS |
| G82z111 | READ | PENIS VEIN THROMBOSIS |
| G82zz00 | READ | EMBOLISM AND THROMBOSIS NOS |
| Gyu8.00 | READ | [X]DISEASES OF VEINS, LYMPHATIC VESSELS & LYMPH NODES, NEC |
| Gyu8000 | READ | [X]PHLEBITIS+THROMBOPHLEBITIS/OTH DEEP VESSLS/LOW EXTREMITES |
| Gyu8100 | READ | [X]PHLEBITIS AND THOMBOPHLEBITIS OF OTHER SITES |
| Gyu8200 | READ | [X]EMBOLISM AND THROMBOSIS OF OTHER SPECIFIED VEINS |
| SP12200 | READ | POST OPERATIVE DEEP VEIN THROMBOSIS |
| G80y900 | READ | THROMBOPHLEBITIS OF THE BREAST-MONDOR'S DISEASE |
| G80y911 | READ | MONDOR'S DISEASE |
| G80yz00 | READ | OTHER PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z.00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z000 | READ | PHLEBITIS NOS |
| G80z100 | READ | THROMBOPHLEBITIS NOS |
| G80zz00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G81..00 | READ | PORTAL VEIN THROMBOSIS |
| G82..00 | READ | OTHER VENOUS EMBOLISM AND THROMBOSIS |
| G820.00 | READ | BUDD-CHIARI SYNDROME (HEPATIC VEIN THROMBOSIS) |
| G820.11 | READ | HEPATIC VEIN THROMBOSIS |
| G820.12 | READ | STUART-BRASS SYNDROME |
| G821.00 | READ | THROMBOPHLEBITIS MIGRANS |
| G822.00 | READ | EMBOLISM AND THROMBOSIS OF THE VENA CAVA |
| G822000 | READ | THROMBOSIS INFERIOR VENA CAVA |
| G823.00 | READ | EMBOLISM AND THROMBOSIS OF THE RENAL VEIN |
| G824.00 | READ | AXILLARY VEIN THROMBOSIS |
| G82y.00 | READ | OTHER EMBOLISM AND THROMBOSIS |
| G82z.00 | READ | EMBOLISM AND THROMBOSIS NOS |
| G82z000 | READ | EMBOLUS OF VEIN NOS |
| G82z011 | READ | EMBOLISM OF VEIN NOS |
| G82z100 | READ | THROMBOSIS OF VEIN NOS |
| G82z111 | READ | PENIS VEIN THROMBOSIS |
| G82zz00 | READ | EMBOLISM AND THROMBOSIS NOS |
| Gyu8.00 | READ | [X]DISEASES OF VEINS, LYMPHATIC VESSELS & LYMPH NODES, NEC |
| Gyu8000 | READ | [X]PHLEBITIS+THROMBOPHLEBITIS/OTH DEEP VESSLS/LOW EXTREMITES |
| Gyu8100 | READ | [X]PHLEBITIS AND THOMBOPHLEBITIS OF OTHER SITES |
| Gyu8200 | READ | [X]EMBOLISM AND THROMBOSIS OF OTHER SPECIFIED VEINS |
| SP12200 | READ | POST OPERATIVE DEEP VEIN THROMBOSIS |
| G80y900 | READ | THROMBOPHLEBITIS OF THE BREAST-MONDOR'S DISEASE |
| G80y911 | READ | MONDOR'S DISEASE |
| G80yz00 | READ | OTHER PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z.00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G80z000 | READ | PHLEBITIS NOS |
| G80z100 | READ | THROMBOPHLEBITIS NOS |
| G80zz00 | READ | PHLEBITIS AND THROMBOPHLEBITIS NOS |
| G81..00 | READ | PORTAL VEIN THROMBOSIS |
| G82..00 | READ | OTHER VENOUS EMBOLISM AND THROMBOSIS |
| G820.00 | READ | BUDD-CHIARI SYNDROME (HEPATIC VEIN THROMBOSIS) |
| G820.11 | READ | HEPATIC VEIN THROMBOSIS |
| G820.12 | READ | STUART-BRASS SYNDROME |
| G821.00 | READ | THROMBOPHLEBITIS MIGRANS |
| G822.00 | READ | EMBOLISM AND THROMBOSIS OF THE VENA CAVA |
| G822000 | READ | THROMBOSIS INFERIOR VENA CAVA |
| G823.00 | READ | EMBOLISM AND THROMBOSIS OF THE RENAL VEIN |
| G824.00 | READ | AXILLARY VEIN THROMBOSIS |
| G82y.00 | READ | OTHER EMBOLISM AND THROMBOSIS |
| G82z.00 | READ | EMBOLISM AND THROMBOSIS NOS |
| G82z000 | READ | EMBOLUS OF VEIN NOS |
| G82z011 | READ | EMBOLISM OF VEIN NOS |
| G82z100 | READ | THROMBOSIS OF VEIN NOS |
| G82z111 | READ | PENIS VEIN THROMBOSIS |
| G82zz00 | READ | EMBOLISM AND THROMBOSIS NOS |
| Gyu8.00 | READ | [X]DISEASES OF VEINS, LYMPHATIC VESSELS & LYMPH NODES, NEC |
| Gyu8000 | READ | [X]PHLEBITIS+THROMBOPHLEBITIS/OTH DEEP VESSLS/LOW EXTREMITES |
| Gyu8100 | READ | [X]PHLEBITIS AND THOMBOPHLEBITIS OF OTHER SITES |
| Gyu8200 | READ | [X]EMBOLISM AND THROMBOSIS OF OTHER SPECIFIED VEINS |
| SP12200 | READ | POST OPERATIVE DEEP VEIN THROMBOSIS |

**Supplemental Table S3:** Death codes and descriptions for the identification of deaths due to a major adverse cardiovascular event within the United States and United Kingdom data sources.

| **CODE** | **TYPE** | **DESCRIPTION** |
| --- | --- | --- |
| I469 | ICD10 | Cardiac arrest, unspecified  |
| I47 | ICD10 | Paroxysmal tachycardia |
| I470 | ICD10 | Re-entry ventricular arrhythmia |
| I471 | ICD10 | Supraventricular tachycardia |
| I472 | ICD10 | Ventricular tachycardia |
| I479 | ICD10 | Paroxysmal tachycardia, unspecified |
| I48 | ICD10 | Atrial fibrillation and flutter  |
| I49 | ICD10 | Other cardiac arrhythmias |
| I490 | ICD10 | Ventricular fibrillation and flutter |
| I491 | ICD10 | Atrial premature depolarization |
| I492 | ICD10 | Junctional premature depolarization |
| I493 | ICD10 | Ventricular premature depolarization |
| I494 | ICD10 | Other and unspecified premature depolarization |
| I495 | ICD10 | Sick sinus syndrome |
| I498 | ICD10 | Other specified cardiac arrhythmias |
| I499 | ICD10 | Cardiac arrhythmia, unspecified |
| I50 | ICD10 | Heart failure |
| I500 | ICD10 | Congestive heart failure |
| I501 | ICD10 | Left ventricular failure |
| I509 | ICD10 | Heart failure, unspecified  |
| I60 | ICD10 | Subarachnoid haemorrhage |
| I600 | ICD10 | Subarachnoid haemorrhage from carotid siphon and bifurcation |
| I601 | ICD10 | Subarachnoid haemorrhage from middle cerebral artery |
| I602 | ICD10 | Subarachnoid haemorrhage from anterior communicating artery |
| I603 | ICD10 | Subarachnoid haemorrhage from posterior communicating artery |
| I604 | ICD10 | Subarachnoid haemorrhage from basilar artery |
| I605 | ICD10 | Subarachnoid haemorrhage from vertebral artery |
| I606 | ICD10 | Subarachnoid haemorrhage from other intracranial arteries |
| I607 | ICD10 | Subarachnoid haemorrhage from intracranial artery, unspecified |
| I608 | ICD10 | Other subarachnoid haemorrhage |
| I609 | ICD10 | Subarachnoid haemorrhage, unspecified  |
| I61 | ICD10 | Intracerebral haemorrhage |
| I610 | ICD10 | Intracerebral haemorrhage in hemisphere, subcortical |
| I611 | ICD10 | Intracerebral haemorrhage in hemisphere, cortical |
| I612 | ICD10 | Intracerebral haemorrhage in hemisphere, unspecified |
| I613 | ICD10 | Intracerebral haemorrhage in brain stem |
| I614 | ICD10 | Intracerebral haemorrhage in cerebellum |
| I615 | ICD10 | Intracerebral haemorrhage, intraventricular |
| I616 | ICD10 | Intracerebral haemorrhage, multiple localized |
| I618 | ICD10 | Other intracerebral haemorrhage |
| I619 | ICD10 | Intracerebral haemorrhage, unspecified  |
| I62 | ICD10 | Other nontraumatic intracranial haemorrhage |
| I620 | ICD10 | Subdural haemorrhage (acute) (nontraumatic) |
| I621 | ICD10 | Nontraumatic extradural haemorrhage |
| I629 | ICD10 | Intracranial haemorrhage (nontraumatic), unspecified  |
| I63 | ICD10 | Cerebral infarction |
| I630 | ICD10 | Cerebral infarction due to thrombosis of precerebral arteries |
| I631 | ICD10 | Cerebral infarction due to embolism of precerebral arteries |
| I632 | ICD10 | Cerebral infarction due to unspecified occlusion or stenosis of precerebral arteries |
| I633 | ICD10 | Cerebral infarction due to thrombosis of cerebral arteries |
| I634 | ICD10 | Cerebral infarction due to embolism of cerebral arteries |
| I635 | ICD10 | Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries |
| I636 | ICD10 | Cerebral infarction due to cerebral venous thrombosis, nonpyogenic |
| I638 | ICD10 | Other cerebral infarction |
| I639 | ICD10 | Cerebral infarction, unspecified  |
| I64 | ICD10 | Stroke, not specified as haemorrhage or infarction  |
| I65 | ICD10 | Occlusion and stenosis of precerebral arteries, not resulting in cerebral infarction |
| I650 | ICD10 | Occlusion and stenosis of vertebral artery |
| I651 | ICD10 | Occlusion and stenosis of basilar artery |
| I652 | ICD10 | Occlusion and stenosis of carotid artery |
| I653 | ICD10 | Occlusion and stenosis of multiple and bilateral precerebral arteries |
| I658 | ICD10 | Occlusion and stenosis of other precerebral artery |
| I659 | ICD10 | Occlusion and stenosis of unspecified precerebral artery  |
| I66 | ICD10 | Occlusion and stenosis of cerebral arteries, not resulting in cerebral infarction |
| I660 | ICD10 | Occlusion and stenosis of middle cerebral artery |
| I661 | ICD10 | Occlusion and stenosis of anterior cerebral artery |
| I662 | ICD10 | Occlusion and stenosis of posterior cerebral artery |
| I663 | ICD10 | Occlusion and stenosis of cerebellar arteries |
| I664 | ICD10 | Occlusion and stenosis of multiple and bilateral cerebral arteries |
| I668 | ICD10 | Occlusion and stenosis of other cerebral artery |
| I669 | ICD10 | Occlusion and stenosis of unspecified cerebral artery  |
| I670 | ICD10 | Dissection of cerebral arteries, nonruptured |
| I676 | ICD10 | Nonpyogenic thrombosis of intracranial venous system |
| I677 | ICD10 | Cerebral arteritis, not elsewhere classified |
| I69 | ICD10 | Sequelae of cerebrovascular disease |
| I690 | ICD10 | Sequelae of subarachnoid haemorrhage |
| I691 | ICD10 | Sequelae of intracerebral haemorrhage |
| I692 | ICD10 | Sequelae of other nontraumatic intracranial haemorrhage |
| I693 | ICD10 | Sequelae of cerebral infarction |
| I694 | ICD10 | Sequelae of stroke, not specified as haemorrhage or infarction |
| I698 | ICD10 | Sequelae of other and unspecified cerebrovascular diseases  |
| I700 | ICD10 | Atherosclerosis of aorta |

**Supplemental Table S4.** Outcome codes and descriptions for the identification of acute liver failure within the United States data sources.

|  |  |  |
| --- | --- | --- |
| **CODE**  | **TYPE**  | **DESCRIPTION**  |
| 570 | ICD9 | ACUTE NECROSIS OF LIVER |
| 572.2 | ICD9 | HEPATIC COMA |
| 572.4 | ICD9 | HEPATORENAL SYNDROME |
| 996.82 | ICD9 | COMPL LIVER TRANSPLANT |
| V42.7 | ICD9 | LIVER TRANSPLANT STATUS |
| 47133 | CPT | DONOR HEPATECTOMY; CADAVER |
| 47135 | CPT | LIVER ALLOTRANSPLANTATION; ORTHOTOPIC; PARTIAL OR WHOLE |
| 47136 | CPT | LIVER ALLOTRANSPLANTATION; HETEROTOPIC; PARTIAL OR WHOLE |
| 47143 | CPT | PREP CADAVER DONOR ALLOTRANSPLANTATION; NO SPLIT |
| 47144 | CPT | PREP CADAVER DONOR ALLOTRANSPLANTATION; TRISEGMENT SPLIT |
| 47145 | CPT | PREP CADAVER DONOR ALLOTRANSPLANTATION; LOBE SPLIT |
| 47146 | CPT | RECONSTRUCTION LIVER GRAFT PRE-ALLOTRANSPLANTATION; CADAVER OR LIVE DONOR; VENOUS ANASTOMOSIS |
| 47147 | CPT | RECONSTRUCTION LIVER GRAFT PRE-ALLOTRANSPLANTATION; CADAVER OR LIVE DONOR; ARTERIAL ANASTOMOSIS |
| 50.4 | ICD9\_px | TOTAL HEPATECTOMY |
| 50.51 | ICD9\_px | AUXILIARY LIVER TRANSPL |
| 50.59 | ICD9\_px | LIVER TRANSPLANT NEC |

**Supplemental Table S5.** Outcome codes and descriptions for the identification of acute liver failure within the United Kingdom data sources.

|  |  |  |
| --- | --- | --- |
| **CODE**  | **TYPE**  | **DESCRIPTION**  |
| 7800.00 | READ | TRANSPLANTATION OF LIVER |
| 7800000 | READ | ORTHOTOPIC TRANSPLANTATION OF LIVER |
| 7800100 | READ | HETEROTOPIC TRANSPLANTATION OF LIVER |
| 7800111 | READ | AUXILLARY LIVER TRANSPLANT |
| 7800112 | READ | PIGGY BACK LIVER TRANSPLANT |
| 7800200 | READ | REPLACEMENT OF PREVIOUS LIVER TRANSPLANT |
| 7800300 | READ | TRANSPLANTATION OF LIVER CELLS |
| 7800400 | READ | ORTHOTOPIC TRANSPLANTATION OF WHOLE LIVER |
| 7800500 | READ | ORTHOTOPIC TRANSPLANTATION OF LIVER NEC |
| 7800y00 | READ | OTHER SPECIFIED TRANSPLANTATION OF LIVER |
| 7800z00 | READ | TRANSPLANTATION OF LIVER NOS |
| J60..00 | READ | ACUTE AND SUBACUTE LIVER NECROSIS |
| J600.00 | READ | ACUTE NECROSIS OF LIVER |
| J600000 | READ | ACUTE HEPATIC FAILURE |
| J600011 | READ | ACUTE LIVER FAILURE |
| J600100 | READ | ACUTE HEPATITIS-NONINFECTIVE |
| J600200 | READ | ACUTE YELLOW ATROPHY |
| J600z00 | READ | ACUTE NECROSIS OF LIVER NOS |
| J601.00 | READ | SUBACUTE NECROSIS OF LIVER |
| J601000 | READ | SUBACUTE HEPATIC FAILURE |
| J601100 | READ | SUBACUTE HEPATITIS-NONINFECTIVE |
| J601200 | READ | SUBACUTE YELLOW ATROPHY |
| J601z00 | READ | SUBACUTE NECROSIS OF LIVER NOS |
| J60z.00 | READ | ACUTE AND SUBACUTE LIVER NECROSIS NOS |
| J622.00 | READ | HEPATIC COMA |
| J624.00 | READ | HEPATORENAL SYNDROME |

**Supplemental Table S6.** Outcome codes and descriptions for the identification of acute kidney injury within the United States data sources.

| **CODE** | **TYPE** | **DESCRIPTION** |
| --- | --- | --- |
| 016.00 | ICD9 | TB OF KIDNEY-UNSPEC |
| 016.01 | ICD9 | TB OF KIDNEY-NO EXAM |
| 016.02 | ICD9 | TB OF KIDNEY-EXAM UNKN |
| 016.03 | ICD9 | TB OF KIDNEY-MICRO DX |
| 016.04 | ICD9 | TB OF KIDNEY-CULT DX |
| 016.05 | ICD9 | TB OF KIDNEY-HISTO DX |
| 016.06 | ICD9 | TB OF KIDNEY-OTH TEST |
| 095.4 | ICD9 | SYPHILIS OF KIDNEY |
| 189.0 | ICD9 | MALIG NEOPL KIDNEY |
| 189.9 | ICD9 | MAL NEO URINARY NOS |
| 223.0 | ICD9 | BENIGN NEOPLASM KIDNEY |
| 236.91 | ICD9 | UNC BEHAV NEO KIDNEY |
| 249.40 | ICD9 | SEC DM RENL NT ST UNCNTR |
| 249.41 | ICD9 | SEC DM RENAL UNCONTRLD |
| 250.40 | ICD9 | DMII RENL NT ST UNCNTRLD |
| 250.41 | ICD9 | DMI RENL NT ST UNCNTRLD |
| 250.42 | ICD9 | DMII RENAL UNCNTRLD |
| 250.43 | ICD9 | DMI RENAL UNCNTRLD |
| 271.4 | ICD9 | RENAL GLYCOSURIA |
| 274.10 | ICD9 | GOUTY NEPHROPATHY NOS |
| 283.11 | ICD9 | HEMOLYTIC UREMIC SYND |
| 285.11 | ICD9 | ANEMIA IN CHRONIC KIDNEY DISEASE |
| 403.01 | ICD9 | MAL HYP KID W CR KID V |
| 403.11 | ICD9 | BEN HYP KID W CR KID V |
| 403.91 | ICD9 | HYP KID NOS W CR KID V |
| 404.02 | ICD9 | MAL HY HT/KD ST V W/O HF |
| 404.03 | ICD9 | MAL HYP HT/KD STG V W HF |
| 404.12 | ICD9 | BEN HY HT/KD ST V W/O HF |
| 404.13 | ICD9 | BEN HYP HT/KD STG V W HF |
| 404.92 | ICD9 | HY HT/KD NOS ST V W/O HF |
| 404.93 | ICD9 | HYP HT/KD NOS ST V W HF |
| 440.1 | ICD9 | RENAL ARTERY ATHEROSCLER |
| 442.1 | ICD9 | RENAL ARTERY ANEURYSM |
| 572.4 | ICD9 | HEPATORENAL SYNDROME |
| 581.0 | ICD9 | NEPHROTIC SYN, PROLIFER |
| 581.1 | ICD9 | EPIMEMBRANOUS NEPHRITIS |
| 581.2 | ICD9 | MEMBRANOPROLIF NEPHROSIS |
| 581.3 | ICD9 | MINIMAL CHANGE NEPHROSIS |
| 581.81 | ICD9 | NEPHROTIC SYN IN OTH DIS |
| 581.89 | ICD9 | NEPHROTIC SYNDROME NEC |
| 581.9 | ICD9 | NEPHROTIC SYNDROME NOS |
| 582.0 | ICD9 | CHR PROLIFERAT NEPHRITIS |
| 582.1 | ICD9 | CHR MEMBRANOUS NEPHRITIS |
| 582.2 | ICD9 | CHR MEMBRANOPROLIF NEPHR |
| 582.4 | ICD9 | CHR RAPID PROGR NEPHRIT |
| 582.81 | ICD9 | CHR NEPHRITIS IN OTH DIS |
| 582.89 | ICD9 | CHRONIC NEPHRITIS NEC |
| 582.9 | ICD9 | CHRONIC NEPHRITIS NOS |
| 583.0 | ICD9 | PROLIFERAT NEPHRITIS NOS |
| 583.1 | ICD9 | MEMBRANOUS NEPHRITIS NOS |
| 583.2 | ICD9 | MEMBRANOPROLIF NEPHR NOS |
| 583.4 | ICD9 | RAPIDLY PROG NEPHRIT NOS |
| 583.6 | ICD9 | RENAL CORT NECROSIS NOS |
| 583.7 | ICD9 | NEPHR NOS/MEDULL NECROS |
| 583.81 | ICD9 | NEPHRITIS NOS IN OTH DIS |
| 583.89 | ICD9 | NEPHRITIS NEC |
| 583.9 | ICD9 | NEPHRITIS NOS |
| 584 | ICD9 | ACUTE RENAL FAILURE\* |
| 584.5 | ICD9 | LOWER NEPHRON NEPHROSIS |
| 584.6 | ICD9 | AC RENAL FAIL, CORT NECR |
| 584.7 | ICD9 | AC REN FAIL, MEDULL NECR |
| 584.8 | ICD9 | AC RENAL FAILURE NEC |
| 584.9 | ICD9 | ACUTE RENAL FAILURE NOS |
| 585 | ICD9 | CHRONIC RENAL FAILURE |
| 585.1 | ICD9 | CHRO KIDNEY DIS STAGE I |
| 585.2 | ICD9 | CHRO KIDNEY DIS STAGE II |
| 585.3 | ICD9 | CHR KIDNEY DIS STAGE III |
| 585.4 | ICD9 | CHR KIDNEY DIS STAGE IV |
| 585.5 | ICD9 | CHRON KIDNEY DIS STAGE V |
| 585.6 | ICD9 | END STAGE RENAL DISEASE |
| 585.9 | ICD9 | CHRONIC KIDNEY DIS NOS |
| 586 | ICD9 | RENAL FAILURE NOS |
| 587 | ICD9 | RENAL SCLEROSIS NOS |
| 588.0 | ICD9 | RENAL OSTEODYSTROPHY |
| 588.1 | ICD9 | NEPHROGEN DIABETES INSIP |
| 588.81 | ICD9 | SEC HYPERPARATHYRD-RENAL |
| 588.89 | ICD9 | IMPAIR REN FUNCT DIS NEC |
| 588.9 | ICD9 | IMPAIRED RENAL FUNCT NOS |
| 591 | ICD9 | HYDRONEPHROSIS |
| 753.12 | ICD9 | POLYCYSTIC KIDNEY NOS |
| 753.13 | ICD9 | POLYCYST KID-AUTOSOM DOM |
| 753.14 | ICD9 | POLYCYST KID-AUTOSOM REC |
| 753.15 | ICD9 | RENAL DYSPLASIA |
| 753.16 | ICD9 | MEDULLARY CYSTIC KIDNEY |
| 753.17 | ICD9 | MEDULLARY SPONGE KIDNEY |
| 753.19 | ICD9 | CYSTIC KIDNEY DISEAS NEC |
| 753.20 | ICD9 | OBS DFCT REN PLV&URT NOS |
| 753.21 | ICD9 | CONGEN OBST URTROPLV JNC |
| 753.22 | ICD9 | CONG OBST URETEROVES JNC |
| 753.23 | ICD9 | CONGENITAL URETEROCELE |
| 753.29 | ICD9 | OBST DEF REN PLV&URT NEC |
| 794.4 | ICD9 | ABN KIDNEY FUNCT STUDY |
| 996.81 | ICD9 | COMPL KIDNEY TRANSPLANT |
| V4511 | ICD9 | RENAL DIALYSIS STATUS |
| 38.95 | ICD9\_px | VEN CATH RENAL DIALYSIS |
| 39.42 | ICD9\_px | REVIS REN DIALYSIS SHUNT |
| 39.43 | ICD9\_px | REMOV REN DIALYSIS SHUNT |
| 39.95 | ICD9\_px | HEMODIALYSIS |
| 55.01 | ICD9\_px | NEPHROTOMY |
| 55.51 | ICD9\_px | NEPHROURETERECTOMY |
| 55.52 | ICD9\_px | SOLITARY KIDNEY NEPHRECT |
| 55.53 | ICD9\_px | REJECTED KIDNEY NEPHRECT |
| 55.54 | ICD9\_px | BILATERAL NEPHRECTOMY |
| 55.69 | ICD9\_px | KIDNEY TRANSPLANT NEC |
| 55.7 | ICD9\_px | NEPHROPEXY |
| 80069 | CPT | RENAL FUNCTION PANEL |
| 82565 | CPT | CREATININE; BLOOD |
| 90935 | CPT | HEMODIALYSIS PROCEDURE; SINCLE PHYSICIAN EVAL. |
| 90937 | CPT | HEMODIALYSIS PROCEDURE; REPEATED EVALS. |
| 90940 | CPT | HEMODIALYSIS ACCESS FLOW STUDY |
| 90945 | CPT | DIALYSIS PROCEDURE; SINGLE PHYSICIAN EVAL. |
| 90947 | CPT | DIALYSIS PROCEDURE; REPEATED EVALS. |
| 90963 | CPT | END-STAGE RENAL DISEASE (ESRD) RELATED SERVICES FOR HOME DIALYSIS PER FULL MONTH, FOR PATIENTS YOUNGER THAN 2 YEARS OF AGE TO INCLUDE MONITORING FOR THE ADEQUACY OF NUTRITION, ASSESSMENT OF GROWTH AND DEVELOPMENT, AND COUNSELING OF PARENTS |
| 90964 | CPT | END-STAGE RENAL DISEASE (ESRD) RELATED SERVICES FOR HOME DIALYSIS PER FULL MONTH, FOR PATIENTS 2-11 YEARS OF AGE TO INCLUDE MONITORING FOR THE ADEQUACY OF NUTRITION, ASSESSMENT OF GROWTH AND DEVELOPMENT, AND COUNSELING OF PARENTS |
| 90965 | CPT | END-STAGE RENAL DISEASE (ESRD) RELATED SERVICES FOR HOME DIALYSIS PER FULL MONTH, FOR PATIENTS 12-19 YEARS OF AGE TO INCLUDE MONITORING FOR THE ADEQUACY OF NUTRITION, ASSESSMENT OF GROWTH AND DEVELOPMENT, AND COUNSELING OF PARENTS |
| 90966 | CPT | END-STAGE RENAL DISEASE (ESRD) RELATED SERVICES FOR HOME DIALYSIS PER FULL MONTH, FOR PATIENTS 20 YEARS OF AGE AND OLDER |
| 90967 | CPT | END-STAGE RENAL DISEASE (ESRD) RELATED SERVICES FOR DIALYSIS LESS THAN A FULL MONTH OF SERVICE, PER DAY; FOR PATIENTS YOUNGER THAN 2 YEARS OF AGE |
| 90968 | CPT | END-STAGE RENAL DISEASE (ESRD) RELATED SERVICES FOR DIALYSIS LESS THAN A FULL MONTH OF SERVICE, PER DAY; FOR PATIENTS 2-11 YEARS OF AGE |
| 90969 | CPT | END-STAGE RENAL DISEASE (ESRD) RELATED SERVICES FOR DIALYSIS LESS THAN A FULL MONTH OF SERVICE, PER DAY; FOR PATIENTS 12-19 YEARS OF AGE |
| 90970 | CPT | END-STAGE RENAL DISEASE (ESRD) RELATED SERVICES FOR DIALYSIS LESS THAN A FULL MONTH OF SERVICE, PER DAY; FOR PATIENTS 20 YEARS OF AGE AND OLDER |
| 90989 | CPT | DIALYSIS TRAINING OF PATIENT; COMPLETED |
| 90993 | CPT | DIALYSIS TRAINING OF PATIENT; INCOMPLETE |
| 90997 | CPT | HEMOPERFUSION |
| 90999 | CPT | DIALYSIS PROCEDURE NOS; INPATIENT OR OUTPATIENT |
| 99512 | CPT | HOME VISIT FOR HEMODIALYSIS |
| 99601 | CPT | HOME INFUSION; DIALYSIS |
| 4052F | CPT | HEMODIALYSIS VIA FUNCTIONING ARTERIOVENOUS (AV) FISTULA (ESRD) |
| 4053F | CPT | HEMODIALYSIS VIA FUNCTIONING ARTERIOVENOUS (AV) GRAFT (ESRD) |
| 4054F | CPT | HEMODIALYSIS VIA CATHETER (ESRD) |
| 4055F | CPT | PATIENT RECEIVING PERITONEAL DIALYSIS (ESRD) |

**Supplemental Table S7:** Outcome codes and descriptions for the identification of acute kidney injury within the United Kingdom data sources.

| **CODE** | **TYPE** | **DESCRIPTION** |
| --- | --- | --- |
| K04..00 | READ | ACUTE RENAL FAILURE |
| K040.00 | READ | ACUTE RENAL TUBULAR NECROSIS |
| K041.00 | READ | ACUTE RENAL CORTICAL NECROSIS |
| K042.00 | READ | ACUTE RENAL MEDULLARY NECROSIS |
| K042.11 | READ | NECROTISING RENAL PAPILLITIS |
| K043.00 | READ | ACUTE DRUG-INDUCED RENAL FAILURE |
| K044.00 | READ | ACUTE RENAL FAIL URIN OBSTRUCT |
| K04y.00 | READ | OTHER ACUTE RENAL FAILURE |
| K04z.00 | READ | ACUTE RENAL FAILURE NOS |
| 14V2.00 | READ | H/O: RENAL DIALYSIS |
| 14V2.11 | READ | H/O: KIDNEY DIALYSIS |
| 7L1A.00 | READ | COMPENSATION FOR RENAL FAILURE |
| 7L1A.11 | READ | DIALYSIS FOR RENAL FAILURE |
| 7L1A000 | READ | RENAL DIALYSIS |
| 7L1A011 | READ | THOMAS INTRAVASCULAR SHUNT FOR DIALYSIS |
| 7L1Ay00 | READ | OTHER SPECIFIED COMPENSATION FOR RENAL FAILURE |
| 7L1Az00 | READ | COMPENSATION FOR RENAL FAILURE NOS |
| ZV45100 | READ | [V]RENAL DIALYSIS STATUS |
| ZV56.00 | READ | [V]AFTERCARE INVOLVING INTERMITTENT DIALYSIS |
| ZV56000 | READ | [V]AFTERCARE INVOLVING EXTRACORPOREAL DIALYSIS |
| ZV56011 | READ | [V]AFTERCARE INVOLVING RENAL DIALYSIS NOS |
| ZV56100 | READ | [V]PREPARATORY CARE FOR DIALYSIS |
| ZV56y00 | READ | [V]OTHER SPECIFIED AFTERCARE INVOLVING INTERMITTENT DIALYSIS |
| ZV56y11 | READ | [V]AFTERCARE INVOLVING PERITONEAL DIALYSIS |
| ZV56z00 | READ | [V]UNSPECIFIED AFTERCARE INVOLVING INTERMITTENT DIALYSIS |
| ZVu3G00 | READ | [X]OTHER DIALYSIS |
| K0D..00 | READ | END-STAGE RENAL DISEASE |
| 7L1A200 | READ | HAEMODIALYSIS NEC |
| 7L1A300 | READ | HAEMOFILTRATION |
| 7L1A700 | READ | HAEMOPERFUSION |
| K06..00 | READ | RENAL FAILURE UNSPECIFIED |
| K06..11 | READ | URAEMIA NOS |
| K060.00 | READ | RENAL IMPAIRMENT |
| K060.11 | READ | IMPAIRED RENAL FUNCTION |
| Kyu2000 | READ | [X]OTHER ACUTE RENAL FAILURE |
| A160200 | READ | TUBERCULOUS PYELONEPHRITIS |
| G500400 | READ | ACUTE PERICARDITIS-URAEMIC |
| K100600 | READ | CALCULOUS PYELONEPHRITIS |
| K101.00 | READ | ACUTE PYELONEPHRITIS |
| K101000 | READ | ACUTE PYELONEPHRITIS WITHOUT MEDULLARY NECROSIS |
| K101100 | READ | ACUTE PYELONEPHRITIS WITH MEDULLARY NECROSIS |
| K101z00 | READ | ACUTE PYELONEPHRITIS NOS |
| K104.00 | READ | XANTHOGRANULOMATOUS PYELONEPHRITIS |
| K10y.00 | READ | PYELONEPHRITIS AND PYONEPHROSIS UNSPECIFIED |
| K10y000 | READ | PYELONEPHRITIS UNSPECIFIED |
| K10y300 | READ | PYELONEPHRITIS IN DISEASES EC |
| K10yz00 | READ | UNSPECIFIED PYELONEPHRITIS NOS |
| 7L1A100 | READ | PERITONEAL DIALYSIS |
| 7L1A400 | READ | AUTOMATED PERITONEAL DIALYSIS |
| 7L1A500 | READ | CONTINUOUS AMBULATORY PERITONEAL DIALYSIS |
| 7L1A600 | READ | PERITONEAL DIALYSIS NEC |
| 14S2.00 | READ | H/O: KIDNEY RECIPIENT |
| 7B00.00 | READ | TRANSPLANTATION OF KIDNEY |
| 7B00000 | READ | AUTOTRANSPLANT OF KIDNEY |
| 7B00100 | READ | TRANSPLANTATION OF KIDNEY FROM LIVE DONOR |
| 7B00111 | READ | ALLOTRANSPLANTATION OF KIDNEY FROM LIVE DONOR |
| 7B00200 | READ | TRANSPLANTATION OF KIDNEY FROM CADAVER |
| 7B00211 | READ | ALLOTRANSPLANTATION OF KIDNEY FROM CADAVER |
| 7B00300 | READ | ALLOTRANSPLANTATION OF KIDNEY FROM CADAVER, HEART-BEATING |
| 7B00400 | READ | ALLOTRANSPLANTATION KIDNEY FROM CADAVER, HEART NON-BEATING |
| 7B00500 | READ | ALLOTRANSPLANTATION OF KIDNEY FROM CADAVER NEC |
| 7B00y00 | READ | OTHER SPECIFIED TRANSPLANTATION OF KIDNEY |
| 7B00z00 | READ | TRANSPLANTATION OF KIDNEY NOS |
| ZV42000 | READ | [V]KIDNEY TRANSPLANTED |
| 44J3.00 | READ | SERUM CREATININE |
| 44J3000 | READ | SERUM CREATININE ABNORMAL |
| 44J3300 | READ | SERUM CREATININE RAISED |
| 44J3z00 | READ | SERUM CREATININE NOS |

**Supplemental Table S8.** Outcome codes and descriptions for the identification of infection within the United States data sources.

| **CODE** | **TYPE** | **DESCRIPTION** |
| --- | --- | --- |
| **HERPES ZOSTER** |
| 053\* | ICD9 | HERPES ZOSTER\* |
| **NON-TUBERCULOUS MYCOBACTERIAL DISEASE** |
| 030\* | ICD9 | LEPROSY\* |
| 031\* | ICD9 | OTHER MYCOBACTERIAL DIS\* |
| **TUBERCULOSIS** |
| 01\* | ICD9 | PRIMARY TB INFECTION\* |
| 137\* | ICD9 | LATE EFFECT TUBERCULOSIS |
| **RESPIRATORY INFECTIONS** |
| 46\* | ICD9 | ACUTE RESPIRATORY INFECTIONS |
| 472\* | ICD9 | CHRONIC PHARYNGITIS AND NASOPHARYNGITIS |
| 473\* | ICD9 | CHRONIC SINUSITIS |
| 474\* | ICD9 | CHRONIC TONSIL AND ADENOID DISEASE |
| 475\* | ICD9 | PERITONSILLAR ABSCESS |
| 476\* | ICD9 | CHRONIC LARYNGITIS AND LARYNGOTRACHEITIS |
| 48\* | ICD9 | PNEUMONIA AND INFLUENZA |
| 490\* | ICD9 | BRONCHITIS NOS |
| **INFECTIONS** |
| 001\*-139\* | ICD9 | INFECTIOUS AND PARASITIC DISEASES |
| 320\*-326\* | ICD9 | INFLAMMATORY DISEASES OF THE CENTRAL NERVOUS SYSTEM |
| 78.5 | ICD9 | CYTOMEGALOVIRAL DISEASE |
| 771.1 | ICD9 | CONG CYTOMEGALOVIRUS INF |
| 75 | ICD9 | INFECTIOUS MONONUCLEOSIS |
| 070.2\* | ICD9 | HEPATITIS B WITH COMA\* |
| 070.3\* | ICD9 | HEPATITIS B W/O COMA\* |
| 70.4 | ICD9 | VIRAL HEPAT NEC W COMA\* |
| 70.41 | ICD9 | HPT C ACUTE W HEPAT COMA |
| 70.44 | ICD9 | CHRNC HPT C W HEPAT COMA |
| 70.49 | ICD9 | OTH VRL HEPAT W HPT COMA |
| 70.5 | ICD9 | VIRAL HEPAT NEC W/O COMA |
| 70.51 | ICD9 | HPT C ACUTE WO HPAT COMA |
| 70.54 | ICD9 | CHRNC HPT C WO HPAT COMA |
| 70.59 | ICD9 | OTH VRL HPAT WO HPT COMA |
| 070.7\* | ICD9 | HPT C W/O HEPAT COMA NOS |
| 42 | ICD9 | HUMAN IMMUNO VIRUS DIS |
| 376.01 | ICD9 | ORBITAL CELLULITIS |
| 415.12 | ICD9 | SEPTIC PULMONARY EMBOLSM |
| 422.92 | ICD9 | SEPTIC MYOCARDITIS |
| 449 | ICD9 | SEPTIC ARTERIAL EMBOLISM |
| 478.21 | ICD9 | CELLULITIS OF PHARYNX |
| 478.71 | ICD9 | LARYNGEAL CELLULITIS |
| 528.3 | ICD9 | CELLULITIS/ABSCESS MOUTH |
| 590\* | ICD9 | KIDNEY INFECTION\* |
| 595 | ICD9 | CYSTITIS\* |
| 599 | ICD9 | URIN TRACT INFECTION NOS |
| 603.1 | ICD9 | INFECTED HYDROCELE |
| 680\* | ICD9 | INFECTIONS OF SKIN AND SUBCUTANEOUS TISSUE |
| 681\* | ICD9 | CELLULITIS, FINGER/TOE\* |
| 682\* | ICD9 | OTHER CELLULITIS/ABSCESS |
| 683 | ICD9 | ACUTE LYMPHADENITIS |
| 684 | ICD9 | IMPETIGO |
| 685\* | ICD9 | PILONIDAL CYST\* |
| 686\* | ICD9 | OTH LOCAL SKIN INFECTION |
| 785.52 | ICD9 | SEPTIC SHOCK |
| 995.91 | ICD9 | SEPSIS |
| 995.92 | ICD9 | SEVERE SEPSIS |
| 86.21 | ICD9\_px | EXCISION OF PILONID CYST |
| 86.22 | ICD9\_px | EXCISION WOUND DEBRIDEMENT |

**Supplemental Table S9:** Outcome codes and descriptions for the identification of infection within the United Kingdom data sources.

| **CODE**  | **TYPE**  | **DESCRIPTION**  |
| --- | --- | --- |
| **HERPES ZOSTER** |
| A53\*\*00  | READ  | HERPES ZOSTER  |
| A53\*\*11  | READ  | SHINGLES  |
| F011200  | READ  | MENINGITIS DUE TO HERPES ZOSTER VIRUS  |
| F011211  | READ  | HERPES ZOSTER MENINGITIS  |
| F030900  | READ  | ENCEPHALITIS DUE TO HERPES ZOSTER  |
| F030911  | READ  | HERPES ZOSTER ENCEPHALITIS  |
| F374400  | READ  | POLYNEUROPATHY IN HERPES ZOSTER  |
| F501600  | READ  | INFECTIVE OTITIS EXTERNA DUE TO HERPES ZOSTER  |
| F501611  | READ  | HERPES ZOSTER-OTITIS EXTERNA  |
| **NON-TUBERCULOUS MYCOBACTERIAL DISEASE** |
| A30\*  | READ  | LEPROSY  |
| A31\*  | READ  | OTHER MYCOBACTERIAL DISEASES  |
| AE22.00 | READ  | SEQUELA OF LEPROSY  |
| Ayu3000  | READ  | [X] OTHER FORMS OF LEPROSY  |
| Ayu3100  | READ  | [X] LEPROSY, UNSPECIFIED  |
| AyuJ600  | READ  | [X] SEQUELAE OF LEPROSY  |
| **TUBERCULOSIS** |
| A1\*  | READ  | TUBERCULOSIS  |
| AE0\*  | READ  | LATE EFFECTS OF TUBERCULOSIS  |
| F011200  | READ  | MENINGITIS DUE TO HERPES ZOSTER VIRUS  |
| F011211  | READ  | HERPES ZOSTER MENINGITIS  |
| F030900  | READ  | ENCEPHALITIS DUE TO HERPES ZOSTER  |
| F030911  | READ  | HERPES ZOSTER ENCEPHALITIS  |
| F374400  | READ  | POLYNEUROPATHY IN HERPES ZOSTER  |
| F501600  | READ  | INFECTIVE OTITIS EXTERNA DUE TO HERPES ZOSTER  |
| F501611  | READ  | HERPES ZOSTER-OTITIS EXTERNA  |
| **RESPIRATORY INFECTIONS** |
| H0\* | READ  | ACUTE RESPIRATORY INFECTIONS  |
| H12\*  | READ  | CHRONIC PHARYNGITIS AND NASOPHARYNGITIS  |
| H13\*  | READ  | CHRONIC SINUSITIS  |
| H14\*  | READ  | CHRONIC TONSIL AND ADENOID DISEASE  |
| H15\*  | READ  | PERITONSILLAR ABSCESS-QUINSY  |
| H16\*  | READ  | CHRONIC LARYNGITIS AND LARYNGOTRACHEITIS  |
| H2\*  | READ  | PNEUMONIA AND INFLUENZA  |
| **INFECTIONS** |
| A\*  | READ  | INFECTIOUS AND PARASITIC DISEASES  |
| F00\* | READ  | BACTERIAL MENINGITIS  |
| F01\*  | READ  | MENINGITIS DUE TO OTHER ORGANISMS  |
| F02\*  | READ  | MENINGITIS OF UNSPECIFIED CAUSE  |
|  F030\*  | READ  | ENCEPHALITIS IN VIRAL DISEASE EC  |
|  F031\*  | READ  | ENCEPHALITIS DUE TO RICKETTSIA EC  |
|  F032\*  | READ  | ENCEPHALITIS DUE TO PROTOZOA EC  |
|  F033\*  | READ  | ENCEPHALITIS DUE TO OTHER INFECTION  |
|  K10\*  | READ  | INFECTIONS OF KIDNEY  |
|  K15\*  | READ  | CYSTITIS  |
|  M0\*  | READ  | SKIN AND SUBCUTANEOUS TISSUE INFECTIONS  |
|  Myu0\*  | READ  | [X] INFECTIONS OF THE SKIN AND SUBCUTANEOUS TISSUE  |
|  Fyu0.00  | READ  | [X]INFLAMMATORY DISEASES OF THE CENTRAL NERVOUS SYSTEM  |
|  Fyu0000  | READ  | [X]OTHER BACTERIAL MENINGITIS  |
|  Fyu0100  | READ  | [X]MENINGITIS IN VIRAL DISEASES CLASSIFIED ELSEWHERE  |
|  Fyu0200  | READ  | [X]MENINGITIS IN MYCOSES CLASSIFIED ELSEWHERE  |
|  Fyu0300  | READ  | [X]MENINGITIS/OTHER SPECIFD INFECTIOUS+PARASITIC DISEASES CE  |
|  Fyu0400  | READ  | [X]MENINGITIS DUE TO OTHER SPECIFIED CAUSES  |
|  Fyu0500  | READ  | [X]BACTERIAL MENINGOENCEPHALITIS+MENINGOMYELITIS,NEC  |
|  Fyu0600  | READ  | [X]OTHER ENCEPHALITIS, MYELITIS AND ENCEPHALOMYELITIS  |
|  Fyu0700  | READ  | [X]ENCEPHALITIS,MYELITIS+ENCEPHALOMYELITIS/BACTRL DISEASE CE  |
|  Fyu0800  | READ  | [X]ENCEPHALITIS,MYELITIS+ENCEPHALOMYELITIS/VIRAL DISEASE CE  |
|  Fyu0900  | READ  | [X]ENCEPHL,MYELITIS+ENCPHMYLITIS/OTH INFCT+PARASIT DISEAS CE  |
|  Fyu0A00  | READ  | [X]ENCEPHALITIS,MYELITIS+ENCEPHALOMYELITIS/OTHER DISEASES CE  |
|  M2y7.00  | READ  | EOSINOPHILIC CELLULITIS [WELLS]  |
|  F4D0.11  | READ  | CELLULITIS OF EYELIDS  |
|  F4D1400  | READ  | CELLULITIS OF EYELID  |
|  F4G0100  | READ  | ORBITAL CELLULITIS  |
|  F501112  | READ  | CELLULITIS, EXTERNAL EAR  |
|  H1y2100  | READ  | PHARYNX OR NASOPHARYNX CELLULITIS  |
|  H1y5100  | READ  | CELLULITIS OF VOCAL CORDS  |
|  H1y7100  | READ  | CELLULITIS OF LARYNX  |
|  J083.00  | READ  | ORAL CELLULITIS AND ABSCESS  |
|  J083000  | READ  | CELLULITIS OF FLOOR OF MOUTH  |
|  J083100  | READ  | ORAL SOFT TISSUE CELLULITIS UNSPECIFIED  |
|  J083z00  | READ  | ORAL CELLULITIS AND ABSCESS NOS  |
|  J085100  | READ  | CELLULITIS OF LIP  |
|  J54..11  | READ  | CELLULICIS – ANUS OR RECTUM  |
|  J540.11  | READ  | PERIANAL CELLULITIS  |
|  K170300  | READ  | PERIURETHRAL CELLULITIS  |
|  K272300  | READ  | CELLULITIS OF PENIS  |
|  K280200  | READ  | CELLULITIS OF SEMINAL VESICLE  |
|  K284300  | READ  | CELLULITIS OF SCROTUM  |
|  K403.00  | READ  | ACUTE PARAMETRITIS AND PELVIC CELLULITIS  |
|  K403100  | READ  | ACUTE PELVIC CELLULITIS  |
|  K403Z00  | READ  | ACUTE PARAMETRITIS AND PELVIC CELLULITIS NOS  |
|  K404.00  | READ  | CHRONIC PARAMETRITIS AND PELVIC CELLULITIS  |
|  K404000  | READ  | CHRONIC FEMALE PELVIC CELLULITIS  |
|  K405.00  | READ  | PARAMETRITIS AND PELVIC CELLULITIS UNSPECIFIED  |
|  K405100  | READ  | PELVIC CELLULITIS UNSPECIFIED  |
|  K405Z00  | READ  | PARAMETRITIS AND PELVIC CELLULITIS NOS  |
|  G52y300  | READ  | SEPTIC MYOCARDITIS-PNEUMOCOCCAL  |
|  G52y400  | READ  | SEPTIC MYOCARDITIS-STAPHYLOCOCCAL  |
|  G52y500  | READ  | SEPTIC MYOCARDITIS-STREPTOCOCCAL  |
|  G52y600  | READ  | SEPTIC MYOCARDITIS NOS  |
|  H5y0100  | READ  | TRACHEOSTOMY SEPSIS  |
|  M07z.13  | READ  | SEPTIC SPOTS  |
|  M080.12  | READ  | [X]SEPTIC THUMB  |
|  N010.11  | READ  | SEPTIC ARTHRITIS  |
|  R055500  | READ  | [D]SEPTIC SHOCK  |
|  R055511  | READ  | [D]SEPTICAEMIC SHOCK  |

**Supplemental Table S10:** Outcome codes and descriptions for the identification of severe hypersensitivity reactions within the United States data sources.

| **CODE**  | **TYPE**  | **DESCRIPTION**  |
| --- | --- | --- |
| **ANGIOEDEMA** |
| 478.6 | ICD9 | EDEMA OF LARYNX |
| 528.9 | ICD9 | ORAL SOFT TISSUE DIS NEC |
| 995.1 | ICD9 | ANGIONEUROTIC EDEMA |
| 478.25 | ICD9 | EDEMA PHARYNX/NASOPHARYX |
| **ANAPHYLAXIS** |
| 995.0 | ICD9 | ANAPHYLACTIC SHOCK |
| 478.75 | ICD9 | LARYNGEAL SPASM |
| 518.82 | ICD9 | OTHER PULMONARY INSUFF |
| 519.11 | ICD9 | ACUTE BRONCHOSPASM |
| **STEVEN-JOHNSON SYNDROME & TOXIC EPIDERMAL NECROLYSIS** |
| 695.1 | ICD9 | ERYTHEMA MULTIFORME |
| 695.10 | ICD9 | ERYTHEMA MULTIFORME NOS |
| 695.12 | ICD9 | ERYTHEMA MULTIFORME MAJ |
| 695.13 | ICD9 | STEVENS-JOHNSON SYNDROME |
| 695.14 | ICD9 | STEVENS-JOHNSON-TEN SYN |
| 695.15 | ICD9 | TOXIC EPIDRML NECROLYSIS |
| 695.19 | ICD9 | ERYTHEMA MULTIFORME NEC |
| **GENERALIZED URTICARIA** |
| 478.8 | ICD9 | URT HYPERSENS REACT NOS |
| 708.0 | ICD9 | ALLERGIC URTICARIA |
| 708.1 | ICD9 | IDIOPATHIC URTICARIA |
| 708.2 | ICD9 | URTICARIA FROM COLD/HEAT |
| 708.3 | ICD9 | DERMATOGRAPHIC URTICARIA |
| 708.4 | ICD9 | VIBRATORY URTICARIA |
| 708.5 | ICD9 | CHOLINERGIC URTICARIA |
| 708.8 | ICD9 | URTICARIA NEC |
| 708.9 | ICD9 | URTICARIA NOS |
| **OTHER SEVERE SKIN REACTIONS** |
| 287.0 | ICD9 | ALLERGIC PURPURA |
| 995.2 | ICD9 | ADV EFF MED/BIOL SUB NOS |
| 995.3 | ICD9 | ALLERGY, UNSPECIFIED |
| 695.11 | ICD9 | ERYTHMA MULTIFORME MINOR |
| 995.20 | ICD9 | ADV EFF MED/BIOL SUB NOS |
| 995.27 | ICD9 | DRUG ALLERGY NEC |
| 995.29 | ICD9 | ADV EFF MED/BIOL NEC/NOS |
| **RASH** |
| 782.1 | ICD9 | NONSPECIF SKIN ERUPT NEC |
| 782.2 | ICD9 | LOCAL SUPRFICIAL SWELLNG |

**Supplemental Table S11:** Outcome codes and descriptions for the identification of severe hypersensitivity reactions within the United Kingdom data sources.

| **CODE**  | **TYPE**  | **DESCRIPTION**  |
| --- | --- | --- |
| **ANGIOEDEMA** |
| H040000 | READ | ACUTE OEDEMATOUS LARYNGITIS |
| H1y2400 | READ | PHARYNX OR NASOPHARYNX OEDEMA |
| SN51.11 | READ | ANGIOEDEMA |
| **ANAPHYLAXIS** |
| 14M5.00 | READ | H/O: ANAPHYLACTIC SHOCK |
| 23D2.11 | READ | O/E-BRONCHOSPASM |
| D310011 | READ | ANAPHYLACTOID PURPURA |
| F401400 | READ | PHACOANAPHYLACTIC ENDOPHTHALMITIS |
| H061200 | READ | ACUTE BRONCHIOLITIS WITH BRONCHOSPASM |
| H1y7400 | READ | LARYNGEAL SPASM |
| H5y1600 | READ | BRONCHOSPASM |
| SN50.00 | READ | ANAPHYLACTIC SHOCK |
| SN50100 | READ | ANAPHY SHOCK DUE/ADV EFECT/CORRECT DRUG OR MED PROPRLY ADMIN |
| **STEVEN-JOHNSON SYNDROME & TOXIC EPIDERMAL NECROLYSIS** |
| M151.00 | READ | ERYTHEMA MULTIFORME |
| M151.12 | READ | TOXIC EPIDERMAL NECROLYSIS |
| M151700 | READ | STEVENS-JOHNSON SYNDROME |
| M151800 | READ | TOXIC EPIDERMAL NECROLYSIS |
| M151900 | READ | NONBULLOUS ERYTHEMA MULTIFORME |
| M151y00 | READ | OTHER SPECIFIED ERYTHEMA MULTIFORME |
| M151z00 | READ | ERYTHEMA MULTIFORME NOS |
| **GENERALIZED URTICARIA** |
| M28..00 | READ | FAMILIAL FEBRILE URTICARIA |
| M280.00 | READ | URTICARIA |
| M280.11 | READ | ALLERGIC URTICARIA |
| M281.00 | READ | DRUG INDUCED URTICARIA |
| M282.00 | READ | IDIOPATHIC URTICARIA |
| M282000 | READ | URTICARIA DUE TO COLD AND HEAT |
| M282100 | READ | COLD URTICARIA |
| M282111 | READ | THERMAL URTICARIA |
| M282z00 | READ | HEAT URTICARIA |
| M283.00 | READ | URTICARIA DUE TO COLD AND HEAT NOS |
| M283.11 | READ | DERMATOGRAPHIC URTICARIA |
| M284.00 | READ | FACTITIAL URTICARIA |
| M285.00 | READ | VIBRATORY URTICARIA |
| M286.00 | READ | CHOLINERGIC URTICARIA |
| M287.00 | READ | CONTACT URTICARIA |
| M28y.00 | READ | PHYSICAL URTICARIA |
| M28y000 | READ | OTHER SPECIFIED URTICARIA |
| M28y200 | READ | URTICARIA GEOGRAPHICA |
| M28yz00 | READ | URTICARIA PERSISTANS |
| M28z.00 | READ | OTHER SPECIFIED URTICARIA NOS |
| Myu4.00 | READ | URTICARIA NOS |
| Myu4000 | READ | [X]URTICARIA AND ERYTHEMA |
| PH32100 | READ | [X]OTHER URTICARIA |
| **OTHER SEVERE SKIN REACTIONS** |
| H1y8.00 | READ | UPPER RESPIRATORY TRACT HYPERSENSITIVITY REACTION NOS |
| H35z100 | READ | HYPERSENSITIVITY PNEUMONITIS NOS |
| K032300 | READ | ANAPHYLACTOID GLOMERULONEPHRITIS |
| M151.11 | READ | LEYELL'S SYNDROME |
| M151000 | READ | ERYTHEMA ANNULARE |
| M151100 | READ | ERYTHEMA IRIS |
| M151200 | READ | ERYTHEMA MARGINATUM |
| M151300 | READ | ERYTHEMA PAPULATUM |
| M151400 | READ | ERYTHEMA TUBERCULATUM |
| M151500 | READ | ERYTHEMA URTICATUM |
| M151600 | READ | ERYTHEMA VESICULOSUM |
| M151811 | READ | DERMONECROLYSIS |
| M151812 | READ | LYELL'S SYNDROME |
| SN52.00 | READ | DRUG HYPERSENSITIVITY NOS |
| SN52.11 | READ | ADVERSE DRUG REACTION NOS |
| SN52.12 | READ | ALLERGIC DRUG REACTION NOS |
| SN52.13 | READ | DRUG IDIOSYNCRASY NOS |
| SN53.11 | READ | HYPERSENSITIVITY NOS |
| TJ23.00 | READ | ADVERSE REACTION TO INSULINS AND ANTIDIABETIC AGENTS |
| TJ23z00 | READ | ADVERSE REACTION TO INSULINS AND ANTIDIABETIC AGENTS NOS |
| U602311 | READ | [X] ADVERSE REACTION TO INSULINS AND ANTIDIABETIC AGENTS |
| U60231E | READ | [X] ADVERSE REACTION TO INSULINS AND ANTIDIABETIC AGENTS NOS |
| **RASH** |
| 2227.00 | READ | O/E-RASH PRESENT |
| 2227.11 | READ | O/E-ALLERGIC RASH |
| 2227.12 | READ | O/E-ITCHY RASH |
| 1D14.00 | READ | C/O: A RASH |
| 2FU..00 | READ | O/E-ERYTHEMATOUS RASH |
| 2I14.00 | READ | O/E-A RASH |
| M130.11 | READ | DRUG INDUCED RASH |
| M251.11 | READ | HEAT RASH |
| M251.13 | READ | SWEAT RASH |
| M28y.11 | READ | NETTLE RASH |
| R021.00 | READ | [D]RASH AND OTHER NONSPECIFIC SKIN ERUPTION |
| R021100 | READ | [D]RASH ON GENITALS |
| R021z00 | READ | [D]RASH AND OTHER NONSPECIFIC SKIN ERUPTION NOS |

**Supplemental Table S12.** Validation of the electronic algorithm for each outcome of interest, by data source.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Outcome, By Data Source** | **Charts Requested** | **Charts Received** | **Charts Validated** | **Positive Predictive Value (95% CI)** |
| **MACE** |  |  |  |  |
| Medicare | 105 | 67 | 62 | 93% (83.4%-97.5%) |
| HIRDSM | 73 | 51 | 46 | 90% (78.6%-96.7%) |
| CPRD | 67 | 54 | 50 | 93% (82.1%-97.9%) |
| THIN (excluding CPRD) | 47 | 33 | 29 | 88% (71.8%-96.6%) |
| **Acute Liver Failure** |  |  |  |  |
| Medicarea | 240 | 121 | 1 | 0.8% (0.0%-4.5%) |
| HIRDSM a | 56 | 34 | 0 | 0% (0.0%-10.3%) |
| CPRDa | 0 | 0 | 0 | - |
| THIN (excluding CPRD)a | 0 | 0 | 0 | - |
| **Acute Kidney Injury** |  |  |  |  |
| Medicare | 81 | 45 | 42 | 93% (81.7%-98.6%) |
| HIRDSM | 18 | 11 | 9 | 82% (48.2%-97.7%) |
| CPRDa | 25 | 19 | 10 | 53% (28.9%-75.6%) |
| THIN (excluding CPRD)a | 13 | 5 | 1 | 20% (0.5%-71.6%) |
| **Infection** |  |  |  |  |
| Medicare | 170 | 109 | 90 | 83% (74.1%-89.2%) |
| HIRDSM | 126 | 82 | 73 | 89% (80.2%-94.9%) |
| CPRDa | 27 | 21 | 14 | 67% (43.0%-85.4%) |
| THIN (excluding CPRD) | 25 | 14 | 12 | 86% (57.2%-98.2%) |
| **Hypersensitivity** |  |  |  |  |
| Medicarea | 196 | 119 | 51 | 43% (33.8%-52.3%) |
| HIRDSM a | 70 | 38 | 5 | 13% (4.4%-28.1%) |
| CPRDa | 8 | 4 | 1 | 25% (0.6%-80.6%) |
| THIN (excluding CPRD)a | 2 | 1 | 0 | 0% (0.0%-97.5%) |

Abbreviations: CI, confidence interval; CPRD, Clinical Practice Research Datalink; HIRDSM, HealthCore Integrated Research DatabaseSM; MACE, major adverse cardiovascular events; THIN, The Health Improvement Network

a A validated algorithm was unable to be determined, so, conservatively, we included all electronically-identified outcomes that were either confirmed by medical record review or had unobtained charts as events.

**Supplemental Table S13.** Incidence rates and hazard ratios of each outcome among those in each analytic cohort with the use of validated algorithms (where available), by data source, including patients prescribed insulin and/or exenatide.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Saxagliptin Initiators** | **Other OAD Initiators** |  |
| **Outcome, by Data Source** | **No. of Users** | **Person-Years** | **No. of Events** | **Rate of Events per 1,000 Person-Years****(95% CI)** | **No. of Users** | **Person-Years** | **No. of Events** | **Rate of Events per 1,000 Person-Years****(95% CI)** | **Adjusted**a**Hazard Ratio****(95% CI)** |
| **MACE** |  |  |  |  |  |  |  |  |  |
| Medicare | 82,971 | 45,734.2 | 1,290 | 28.2 (26.7-29.8) | 659,994 | 354,439.7 | 11,383 | 32.1 (31.5-32.7) | 0.90 (0.84-0.95) |
| HIRDSM | 10,248 | 6,605.2 | 53 | 8.0 (6.0-10.5) | 97,581 | 45,097.1 | 434 | 9.6 (8.7-10.6) | 0.85 (0.63-1.16) |
| CPRD | 4,149 | 2,770.0 | 21 | 7.6 (4.7-11.6) | 39,220 | 21,735.7 | 156 | 7.2 (6.1-8.4) | 1.00 (0.61-1.65) |
| THIN (excluding CPRD) | 863 | 575.9 | 6 | 10.4 (3.8-22.7) | 5,299 | 3,043.2 | 27 | 8.9 (5.8-12.9) | 1.18 (0.44-3.14) |
| **Acute Liver Failure** |  |  |  |  |  |  |  |  |  |
| Medicareb | 82,781 | 46,227.1 | 33 | 0.7 (0.5-1.0) | 82,781 | 41,862.5 | 48 | 1.1 (0.8-1.5) | 0.75 (0.46-1.24) |
| HIRDSM b | 10,303 | 6,682.4 | 2 | 0.3 (0.04-1.1) | 98,381 | 45,732.7 | 7 | 0.2 (0.06-0.3) | 2.46 (0.43-14.14)c |
| CPRDb | 4,178 | 2,806.9 | 0 | 0.0 (0.0-1.1) | 39,544 | 22,072.6 | 0 | 0.0 (0.0-0.1) | - |
| THIN (excluding CPRD)b | 871 | 587.2 | 0 | 0.0 (0.0-5.1) | 5,345 | 3,075.0 | 0 | 0.0 (0.0-1.0) | - |
| **Acute Kidney Injury** |  |  |  |  |  |  |  |  |  |
| Medicare | 71,806 | 39,617.4 | 409 | 10.3 (9.3-11.4) | 600,712 | 328,934.3 | 3,445 | 10.5 (10.1-10.8) | 0.94 (0.85-1.05) |
| HIRDSM | 9,809 | 6,379.1 | 5 | 0.8 (0.3-1.8) | 95,178 | 44,141.4 | 30 | 0.7 (0.5-1.0) | 0.89 (0.32-2.46) |
| CPRDb | 3,218 | 2,085.8 | 0 | 0.0 (0.0-1.4) | 35,656 | 19,633.0 | 7 | 0.4 (0.1-0.7) | - |
| THIN (excluding CPRD)b | 643 | 438.2 | 0 | 0.0 (0.0-6.8) | 4,685 | 2,678.4 | 4 | 1.5 (0.4-3.8) | - |
| **Infection** |  |  |  |  |  |  |  |  |  |
| Medicare | 87,423 | 47,573.7 | 2,919 | 61.4 (59.2-63.6) | 675,968 | 360,612.4 | 23,058 | 63.9 (63.1-64.8) | 0.96 (0.92-1.00) |
| HIRDSM | 10,289 | 6,640.9 | 100 | 15.1 (12.3-18.3) | 97,345 | 45,118.5 | 631 | 14.0 (12.9-15.1) | 1.10 (0.88-1.38) |
| CPRDb | 4,071 | 2,660.1 | 89 | 33.5 (26.9-41.2) | 38,645 | 21,093.4 | 743 | 35.2 (32.7-37.9) | 0.89 (0.70-1.13) |
| THIN (excluding CPRD) | 857 | 562.7 | 2 | 3.6 (0.4-12.8) | 5,246 | 2,965.5 | 22 | 7.4 (4.6-11.2) | 0.55 (0.12-2.59) |
| **Hypersensitivity** |  |  |  |  |  |  |  |  |  |
| Medicareb | 92,572 | 51,282.0 | 102 | 2.0 (1.6-2.4) | 740,116 | 398,368.4 | 902 | 2.3 (2.1-2.4) | 0.87 (0.70-1.08) |
| HIRDSM b | 10,511 | 6,802.7 | 8 | 1.2 (0.5-2.3) | 100,268 | 46,482.7 | 83 | 1.8 (1.4-2.2) | 0.78 (0.36-1.69) |
| CPRDb | 4,179 | 2,806.0 | 3 | 1.1 (0.2-3.1) | 39,598 | 22,083.5 | 13 | 0.6 (0.3-1.0) | 2.63 (0.57-12.01)c |
| THIN (excluding CPRD)b | 872 | 587.7 | 0 | 0.0 (0.0-5.1) | 5,353 | 3,079.7 | 0 | 0.0 (0.0-1.0) | - |
| Abbreviations: CI, confidence interval; CPRD, Clinical Practice Research Datalink; HIRDSM, HealthCore Integrated Research DatabaseSM; MACE, major adverse cardiovascular events; OAD, oral anti-diabetic drug; Saxa, saxagliptin; THIN, The Health Improvement Network |
| a Adjusted for prior OAD therapy, quarter of observation, and geographic region unless otherwise notedb A validated algorithm was unable to be determined, so, conservatively, we included all electronically-identified outcomes that were either confirmed by medical record review or had unobtained charts as events.c Since there were not enough events to run the fully-adjusted model, the propensity score-adjusted hazard ratio is presented. |

**Supplemental Table S14.** Minimum hazard ratios for the association between the unmeasured confounder and each outcome that would case inference to change for each value of the prevalence difference from 0.02 to 0.20, in 0.02 increments and by data source.

|  |  |  |
| --- | --- | --- |
| **Outcome, by Data Source** | **Hazard Ratio (95% CI)** | **Prevalence Difference (P1-P0)** |
| **0.02** | **0.04** | **0.06** | **0.08** | **0.10** | **0.12** | **0.14** | **0.16** | **0.18** | **0.20** |
| **MACE** |  |  |  |  |  |  |  |  |  |  |  |
| Medicare | 0.92 (0.86-0.98) | 9.1 | 5.1 | 3.7 | 3.0 | 2.6 | 2.4 | 2.2 | 2.0 | 1.9 | 1.8 |
| HIRDSM | 0.86 (0.62-1.20) | 31.6 | 16.3 | 11.2 | 8.7 | 7.1 | 6.1 | 5.4 | 4.8 | 4.4 | 4.1 |
| CPRD | 0.63 (0.35-1.16) | 93.9 | 47.4 | 32.0 | 24.2 | 19.6 | 16.5 | 14.3 | 12.6 | 11.3 | 10.3 |
| THIN (excluding CPRD) | 0.99 (0.34-2.87) | 98.1 | 49.5 | 33.4 | 25.3 | 20.4 | 17.2 | 14.9 | 13.1 | 11.8 | 10.7 |
| **Acute Liver Failure** |  |  |  |  |  |  |  |  |  |  |  |
| Medicarea | 0.72 (0.42-1.25) | 70.0 | 35.5 | 24.0 | 18.3 | 14.8 | 12.5 | 10.9 | 9.6 | 8.7 | 7.9 |
| HIRDSM a | 2.97 (0.49-18.11) | 53.0 | 27.0 | 18.3 | 14.0 | 11.4 | 9.7 | 8.4 | 7.5 | 6.8 | 6.2 |
| CPRDa | -b | - | - | - | - | - | - | - | - | - | - |
| THIN (excluding CPRD)a | -b | - | - | - | - | - | - | - | - | - | - |
| **Acute Kidney Injury** |  |  |  |  |  |  |  |  |  |  |  |
| Medicare | 0.99 (0.88 - 1.11) | 7.8 | 4.4 | 3.3 | 2.7 | 2.4 | 2.1 | 2 | 1.9 | 1.8 | 1.7 |
| HIRDSM | 0.88 (0.29-2.74) | 123.4 | 62.2 | 41.8 | 31.6 | 25.5 | 21.4 | 18.5 | 16.3 | 14.6 | 13.2 |
| CPRDa | -b | - | - | - | - | - | - | - | - | - | - |
| THIN (excluding CPRD)a | -b | - | - | - | - | - | - | - | - | - | - |
| **Infection** |  |  |  |  |  |  |  |  |  |  |  |
| Medicare | 0.97 (0.92-1.01) | 5.3 | 3.2 | 2.4 | 2.1 | 1.9 | 1.7 | 1.6 | 1.5 | 1.5 | 1.4 |
| HIRDSM | 1.07 (0.83-1.37) | 11.2 | 6.1 | 4.4 | 3.6 | 3.0 | 2.7 | 2.5 | 2.3 | 2.1 | 2.0 |
| CPRDa | 0.81 (0.63-1.06) | 30.4 | 15.7 | 10.8 | 8.3 | 6.9 | 5.9 | 5.2 | 4.7 | 4.3 | 3.9 |
| THIN (excluding CPRD) | 0.64 (0.13-3.16) | 335.6 | 168.3 | 112.5 | 84.7 | 67.9 | 56.8 | 48.8 | 42.8 | 38.2 | 34.5 |
| **Hypersensitivity** |  |  |  |  |  |  |  |  |  |  |  |
| Medicarea | 0.80 (0.62-1.02) | 31.6 | 16.3 | 11.2 | 8.7 | 7.1 | 6.1 | 5.4 | 4.8 | 4.4 | 4.1 |
| HIRDSM a | 0.48 (0.17-1.38) | 245.1 | 123.1 | 82.4 | 62.0 | 49.8 | 41.7 | 35.9 | 31.5 | 28.1 | 25.4 |
| CPRDa | 1.80 (0.31-10.28) | 112.3 | 56.6 | 38.1 | 28.8 | 23.3 | 19.5 | 16.9 | 14.9 | 13.4 | 12.1 |
| THIN (excluding CPRD)a | -b | - | - | - | - | - | - | - | - | - | - |
| Abbreviations: CI, confidence interval; CPRD, Clinical Practice Research Datalink; HIRDSM, HealthCore Integrated Research DatabaseSM; MACE, major adverse cardiovascular events; THIN, The Health Improvement Network |
| a A validated algorithm was unable to be determined, so, conservatively, we included all electronically-identified outcomes that were either confirmed by medical record review or had unobtained charts as events.b Hazard ratios unable to be calculated since no events were electronically identified |

**Supplemental Figure S1.** Selection of patients into each cohort within Medicare (**panel a**), the HealthCore Integrated Research DatabaseSM (HIRDSM; **panel b**), Clinical Practice Research Datalink (CPRD; **panel c**), and The Health Improvement Network (THIN; excluding CPRD; **panel d**).

**Panel A.**

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Abbreviations: AKI, acute kidney injury; ALF, acute liver failure; DPP-4, dipeptidyl peptidase-4; MACE, major adverse cardiovascular events; OAD, oral anti-diabetic drug

**Panel B.**

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Abbreviations: AKI, acute kidney injury; ALF, acute liver failure; DPP-4, dipeptidyl peptidase-4; MACE, major adverse cardiovascular events; OAD, oral anti-diabetic drug

**Panel C.**

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Abbreviations: AKI, acute kidney injury; ALF, acute liver failure; DPP-4, dipeptidyl peptidase-4; MACE, major adverse cardiovascular events; OAD, oral anti-diabetic drug

**Panel D.**

****

Abbreviations: AKI, acute kidney injury; ALF, acute liver failure; DPP-4, dipeptidyl peptidase-4; MACE, major adverse cardiovascular events; OAD, oral anti-diabetic drug