**Web Supplementary 2 of “Structured variable selection: an application in identifying predictors of major bleeding among hospitalized hypertensive patients using oral anticoagulants for atrial fibrillation”**

**Authors**

**Variable definition**

**Outcome**

**Major bleeding** (binary): 1 if the patient had at least one of the following diseases in the one-year follow-up

**AE- Prior major bleeding using only Med-Echo and RAMQ with specific definition**

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| Major intracranial bleeding | 430, 431, 432.x, 852.x, 853.x (primary diagnosis or the first secondary diagnosis using Med-Echo) | I60, I61, I62, S06.3, S06.4, S06.5, S06.6 (primary diagnosis or the first secondary diagnosis using Med-Echo) |
| Major GI bleeding |  |  |
| Upper gastrointestinal bleeding  (only using Med-Echo) | 456.1, 530.7, 531.0x, 531.2x, 531.4x, 531.6x, 532.0x, 532.2x, 532.4x. 532.6x, 533.0x. 533.2x, 533.4x, 533.6x, 534.0x, 534.2x, 534.4x, 534.6x, 535.1, 537.83, 578.0 (primary diagnosis only using Med-Echo) | I85.0, K22.6, K25.0, K25.2, K25.4, K25.6, K26.0, K26.2, K26.4, K26.6, K27.0, K27.2, K27.4, K27.6, K28.0, K28.2, K28.4, K28.6, K29.0, K31.811, K92.0 (primary diagnosis only using Med-Echo) |
| Upper gastrointestinal bleeding  (only using RAMQ) | 456.1, 530.7, 531.0x, 531.2x, 531.4x, 531.6x, 532.0x, 532.2x, 532.4x. 532.6x, 533.0x, 533.2x, 533.4x, 533.6x, 534.0x, 534.2x, 534.4x, 534.6x, 535.1, 537.83, 578.0 RAMQ ICD-9 at an emergency room and procedure endoscopic control of gastric or duodenal bleeding or upper gastrointestinal endoscopy including esophagus, stomach, and either the duodenum and/or jejunum as appropriate with control of bleeding, any method (code 00691) within 7 days | I85.0, K22.6, K25.0, K25.2, K25.4, K25.6, K26.0, K26.2, K26.4, K26.6, K27.0, K27.2, K27.4, K27.6, K28.0, K28.2, K28.4, K28.6, K29.0, K31.811, K92.0 RAMQ ICD-9 at an emergency room and procedure endoscopic control of gastric or duodenal bleeding or upper gastrointestinal endoscopy including esophagus, stomach, and either the duodenum and/or jejunum as appropriate with control of bleeding, any method (00691) within 7 days |
| Lower gastrointestinal bleeding | 562.02, 562.03, 562.12, 562.13, 569.3x, 569.85, 578.1x, 578.9 (primary diagnosis only using Med-Echo) | K57.11, K57.13, K57.31, K57.33, K62.5, K55.21, K92.1, K92.2 (primary diagnosis only using Med-Echo) |
| Other major bleeds |  |  |
| Gross hematuria | 599.7 (primary diagnosis only using Med-Echo) | R31 (primary diagnosis only using Med-Echo) |
| Hemoptysis | 786.3x (primary diagnosis only using Med-Echo) | R04.2, R04.89, R04.9 (primary diagnosis only using Med-Echo) |
| Vitreous hemorrhage | 379.23 (primary diagnosis only using Med-Echo) | H43.13 (primary diagnosis only using Med-Echo) |
| Urogenital bleed | 626.2x and 280.0 (primary only), 285.1 (principal diagnosis or the first secondary diagnosis) or 285.9 (principal diagnosis or the first secondary diagnosis using Med-Echo) | N92.0 and D50.0 (primary only), D62 (principal diagnosis or the first secondary diagnosis), D64.9 (principal diagnosis or the first secondary diagnosis using Med-Echo) |
| Hemarthrosis | 719.1x (primary diagnosis only using Med-Echo) | M25.0x (primary diagnosis only using Med-Echo) |
| Hemopericardium | 423.0 (primary diagnosis only using Med-Echo) | I31.2 (primary diagnosis only using Med-Echo) |
| Hemoperitoneum | 568.8 (primary diagnosis only using Med-Echo) | K66.1 (primary diagnosis only using Med-Echo) |
| Hemorrhage not specified | 459.0x (primary diagnosis only using Med-Echo) | R58.0 (primary diagnosis only using Med-Echo) |
| Acute posthemorrhagic anemia | 285.1x (primary diagnosis only using Med-Echo) | D62 (primary diagnosis only using Med-Echo) |
| Instrumental bleeds  Codes in addition to other previous codes | 996x, 997x, 998x, 999x, 8602, 8603, 8604, 8605, 851x, 920x, 921x, 922x, 923x, 924x | S271x, S272.x |

**Covariates**

1. Sociodemographic Covariates
2. **Age** (Binary): 1 if the patient’s age was greater than or equal to 75 years old at cohort entry
3. **Sex** (Binary): 1 if the patient is female
4. Score
5. **Cha2Ds2Vasc** score (Binary): 1 if the score was greater than or equal to 3 at cohort entry

|  |  |
| --- | --- |
| **Cha2Ds2Vasc** | **Points if present** |
| Congestive heart failure or left ventricular dysfunction | 1 |
| Hypertension | 1 |
| Age 65 – 74 years | 1 |
| Age ≥ 75 years | 2 |
| Diabetes Mellitus | 1 |
| Stroke (ischemic stroke, transient ischemic disease or systemic embolism | 2 |
| Vascular disease (myocardial infarction, peripheral arterial disease, or aortic plaque | 1 |
| Sex category (female) | 1 |

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| Congestive heart failure | 402.01, 402.11, 402.91, 404.01, 404.11, 404.91, 404.03, 404.13, 404.93, 425.4,428.0 | I11.0, I13.0, I13.2, I42.0, I50 |
| Left ventricular dysfunction | 428.1, 428.9 | I50.1, I50.9 |
| Hypertension | 401 | I10 |
| Diabetes | 250.x | E08, E10, E11, E13 |
| Ischemic stroke | 433.xx, 434.xx, 436 | I63 except 63.6, I67.89 |
| Systemic embolism | 444.x, 557.0, 362.31, 362.32, 598.31 | I74, K55.0, H34.1, H34.2, N28.0 |
| Transient ischemic stroke (TIA) | 435.x | G45 |
| Aortic plaque | 440.0 | I70.0 |
| Peripheral arterial disease | 440 (except 440.0), 441, 443.0, 443.89, 443.9 | I70.1 to I70.9, I71, I73.0, I73.89, I73.9 |
| Myocardial infarction | 410.xx | I21, I22, I23 |

1. Comorbidities
2. **Renal disease** (binary): 1 if the patient had at least one of the following diseases within 3 years before cohort entry

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| Moderate to severe renal disease | 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 580.0, 580.4, 581.0, 581.1, 581.2, 581.3, 581.89, 581.9, 582.0, 582.1, 582.2, 582.89, 582.9, 583.0, 583.1, 583.2, 583.4, 583.7, 583.6, 583.89, 583.9, 584.5, 584.6, 584.7, 584.8, 584.9, 585.1, 585.2, 585.3, 585.4, 585.5, 585.6, 586, 590.0, 590.01, 590.80 | I12, I13, N00, N01, N02, N03, N04, N05, N07, N11, N12, N14, N17, N18, N19 |

1. **Liver disease** (binary): 1 if the patient had at least one of the following diseases within 3 years before cohort entry

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| Acute necrosis of liver | 570.xx |  |
| Alcoholic fatty liver | 571.0 |  |
| Ac alcoholic hepatitis | 571.1 |  |
| Alcohol cirrhosis liver | 571.2 |  |
| Alcohol liver damage NOS | 571.3 |  |
| Chronic hepatitis | 571.4 |  |
| Cirrhosis of liver NOS | 571.5 |  |
| Biliary cirrhosis | 571.6 |  |
| Chronic liver dis NEC | 571.8 |  |
| Chronic liver dis NOS | 571.9 |  |
| Alcoholic liver disease |  | K70.xx |
| Toxic liver disease |  | K71.xx |
| Hepatic failure, not elsewhere classified |  | K72.xx |
| Chronic hepatitis, not elsewhere classified |  | K73.xx |
| Fibrosis and cirrhosis of liver |  | K74.xx |

1. **Stroke** (binary): 1 if the patient had the following disease 3 years before cohort entry

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| Transient cerebral ischemia | 435 | G45.8, G45.9 |

1. **History of major bleeding** (binary): 1 if the patient had at least one of the following diseases within 3 years before cohort entry

**AE- Prior major bleeding using only Med-Echo and RAMQ with specific definition**

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| Major intracranial bleeding | 430, 431, 432.x, 852.x, 853.x (primary diagnosis or the first secondary diagnosis using Med-Echo) | I60, I61, I62, S06.3, S06.4, S06.5, S06.6 (primary diagnosis or the first secondary diagnosis using Med-Echo) |
| Major GI bleeding |  |  |
| Upper gastrointestinal bleeding  (only using Med-Echo) | 456.1, 530.7, 531.0x, 531.2x, 531.4x, 531.6x, 532.0x, 532.2x, 532.4x. 532.6x, 533.0x. 533.2x, 533.4x, 533.6x, 534.0x, 534.2x, 534.4x, 534.6x, 535.1, 537.83, 578.0 (primary diagnosis only using Med-Echo) | I85.0, K22.6, K25.0, K25.2, K25.4, K25.6, K26.0, K26.2, K26.4, K26.6, K27.0, K27.2, K27.4, K27.6, K28.0, K28.2, K28.4, K28.6, K29.0, K31.811, K92.0 (primary diagnosis only using Med-Echo) |
| Upper gastrointestinal bleeding  (only using RAMQ) | 456.1, 530.7, 531.0x, 531.2x, 531.4x, 531.6x, 532.0x, 532.2x, 532.4x. 532.6x, 533.0x, 533.2x, 533.4x, 533.6x, 534.0x, 534.2x, 534.4x, 534.6x, 535.1, 537.83, 578.0 RAMQ ICD-9 at an emergency room and procedure endoscopic control of gastric or duodenal bleeding or upper gastrointestinal endoscopy including esophagus, stomach, and either the duodenum and/or jejunum as appropriate with control of bleeding, any method (code 00691) within 7 days | I85.0, K22.6, K25.0, K25.2, K25.4, K25.6, K26.0, K26.2, K26.4, K26.6, K27.0, K27.2, K27.4, K27.6, K28.0, K28.2, K28.4, K28.6, K29.0, K31.811, K92.0 RAMQ ICD-9 at an emergency room and procedure endoscopic control of gastric or duodenal bleeding or upper gastrointestinal endoscopy including esophagus, stomach, and either the duodenum and/or jejunum as appropriate with control of bleeding, any method (00691) within 7 days |
| Lower gastrointestinal bleeding | 562.02, 562.03, 562.12, 562.13, 569.3x, 569.85, 578.1x, 578.9 (primary diagnosis only using Med-Echo) | K57.11, K57.13, K57.31, K57.33, K62.5, K55.21, K92.1, K92.2 (primary diagnosis only using Med-Echo) |
| Other major bleeds |  |  |
| Gross hematuria | 599.7 (primary diagnosis only using Med-Echo) | R31 (primary diagnosis only using Med-Echo) |
| Hemoptysis | 786.3x (primary diagnosis only using Med-Echo) | R04.2, R04.89, R04.9 (primary diagnosis only using Med-Echo) |
| Vitreous hemorrhage | 379.23 (primary diagnosis only using Med-Echo) | H43.13 (primary diagnosis only using Med-Echo) |
| Urogenital bleed | 626.2x and 280.0 (primary only), 285.1 (principal diagnosis or the first secondary diagnosis) or 285.9 (principal diagnosis or the first secondary diagnosis using Med-Echo) | N92.0 and D50.0 (primary only), D62 (principal diagnosis or the first secondary diagnosis), D64.9 (principal diagnosis or the first secondary diagnosis using Med-Echo) |
| Hemarthrosis | 719.1x (primary diagnosis only using Med-Echo) | M25.0x (primary diagnosis only using Med-Echo) |
| Hemopericardium | 423.0 (primary diagnosis only using Med-Echo) | I31.2 (primary diagnosis only using Med-Echo) |
| Hemoperitoneum | 568.8 (primary diagnosis only using Med-Echo) | K66.1 (primary diagnosis only using Med-Echo) |
| Hemorrhage not specified | 459.0x (primary diagnosis only using Med-Echo) | R58.0 (primary diagnosis only using Med-Echo) |
| Acute posthemorrhagic anemia | 285.1x (primary diagnosis only using Med-Echo) | D62 (primary diagnosis only using Med-Echo) |
| Instrumental bleeds  Codes in addition to other previous codes | 996x, 997x, 998x, 999x, 8602, 8603, 8604, 8605, 851x, 920x, 921x, 922x, 923x, 924x | S271x, S272.x |

1. **Elderly** (binary): 1 if the patient was older than 65 years old at cohort entry
2. **Anemia** (binary): 1 if the patient had at least one of the following diseases within 3 years before cohort entry

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| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| **Iron deficiency anaemia including anaemia (asiderotic, hypochromic)** |  | D50 |
| Iron deficiency anaemia seconday to blood loss (chronic) | 280.0 | D50.0 |
| **Vitamin B12, deficiency anaemia excluding...** |  | D51 |
| Vitamin B12, deficiency anaemia due to intrinsic factor deficiency including anaemia (Addison, Biermer, pernicious), congenital intrinsic factor deficiency | 281.0 | D51.0 |
| Vitamin B12, deficiency anaemia due to selective vitamin B12 malabsorption with proteinuria including Imerslund (-Gräsbeck) syndrome, Megaloblastic hereditary anaemia | 281.1 | D51.1 |
| **Other nutritional anaemias including megaloblastic anemia unresponsive to vitamin B12 or folate therapy** |  | D53 |
| Nutritional anaemia, unspecified | 281.9 | D53.9 |
| **Acquired haemolytic anaemia** |  | D59 |
| Drug-induced autoimmune haemolytic anaemia | 283.0 | D59.0 |
| Other autoimmune haemolytic anaemia including autoimmune haemolytic disease (cold type) (warm type), chromic cold haemaglutinin disease, cold agglutinin (disease, haemoglobinuria), haemolytic anaemia (cold type) (warm type) | 283.0 | D59.1 |
| Drug-induced nonautoimmune haemolytic anaemia including drug-induced enzyme deficiency anaemia | 283.19 | D59.2 |
| Haemolytic-uraemic syndrome | 283.11 | D59.3 |
| Other nonautoimmune haemolytic anaemias including haemolytic anaemia (mechanical, microangiopathic, toxic) | 283.10, 283.19 | D59.4 |
| **Anaemia in chronic diseases classified elsewhere** |  | D63 |
| Anaemia in neoplastic disease | 285.22 | D63.0 |
| Anaemia in other chronic disease classified elsewhere including anaemia in chronic kidney disease ≥ stage 3 | 285.29 | D63.8 |

1. **Malignancy** (binary): 1 if the patient had at least one of the following diseases within 3 years before cohort entry

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Code** | **Disease** |
|  | **ICD-9** | 140.xx | Malignant neoplasm of lip |
| 141.xx | Malignant neoplasm of tongue |
| 142.xx | Malignant neoplasm of major salivary glands |
| 143.xx | Malignant neoplasm of gum |
| 144.xx | Malignant neoplasm of floor of mouth |
| 145.xx | Malignant neoplasm of other and unspecified parts of mouth |
| 146.xx | Malignant neoplasm of oropharynx |
| 147.xx | Malignant neoplasm of nasopharynx |
| 148.xx | Malignant neoplasm of hypopharynx |
| 149.xx | Malignant neoplasm of other and ill-defined sites within the lip, oral cavity, and pharynx |
| 150.xx | Malignant neoplasm of esophagus |
| 151.xx | Malignant neoplasm of stomach |
| 152.xx | Malignant neoplasm of small intestine, including duodenum |
| 153.xx | Malignant neoplasm of colon |
| 154.xx | Malignant neoplasm of rectum, rectosigmoid junction, and anus |
| 155.xx | Malignant neoplasm of liver and intrahepatic bile ducts |
| 156.xx | Malignant neoplasm of gallbladder and extrahepatic bile ducts |
| 157.xx | Malignant neoplasm of pancreas |
| 158.xx | Malignant neoplasm of retroperitoneum and peritoneum |
| 159.xx | Malignant neoplasm of other and ill-defined sites within the digestive organs and peritoneum |
| 160.xx | Malignant neoplasm of nasal cavities, middle ear, and accessory sinuses |
| 161.xx | Malignant neoplasm of larynx |
| 162.xx | Malignant neoplasm of trachea, bronchus, and lung |
| 163.xx | Malignant neoplasm of pleura |
| 164.xx | Malignant neoplasm of thymus, heart, and mediastinum |
| 165.xx | Malignant neoplasm of other and ill-defined sites within the respiratory system and intrathoracic organs |
| 170.xx | Malignant neoplasm of bone and articular cartilage |
| 171.xx | Malignant neoplasm of connective and other soft tissue |
| 174.xx | Malignant neoplasm of female breast |
| 175.xx | Malignant neoplasm of male breast |
| 176.xx | Kaposi's sarcoma |
| 179.xx | Malignant neoplasm of uterus, part unspecified |
| 180.xx | Malignant neoplasm of cervix uteri |
| 181.xx | Malignant neoplasm of placenta |
| 182.xx | Malignant neoplasm of body of uterus |
| 183.xx | Malignant neoplasm of ovary and other uterine adnexa |
| 184.xx | Malignant neoplasm of other and unspecified female genital organs |
| 185.xx | Malignant neoplasm of prostate |
| 186.xx | Malignant neoplasm of testis |
| 187.xx | Malignant neoplasm of penis and other male genital organs |
| 188.xx | Malignant neoplasm of bladder |
| 189.xx | Malignant neoplasm of kidney and other and unspecified urinary organs |
| 190.xx | Malignant neoplasm of eye |
| 191.xx | Malignant neoplasm of brain |
| 192.xx | Malignant neoplasm of other and unspecified parts of nervous system |
| 193.xx | Malignant neoplasm of thyroid gland |
| 194.xx | Malignant neoplasm of other endocrine glands and related structures |
| 195.xx | Malignant neoplasm of other and ill-defined sites |
| 196.xx | Secondary and unspecified malignant neoplasm of lymph nodes |
| 197.xx | Secondary malignant neoplasm of respiratory and digestive systems |
| 198.xx | Secondary malignant neoplasm of other specified sites |
| 199.xx | Malignant neoplasm without specification of site |
| 200.xx | Lymphosarcoma and reticulosarcoma and other specified malignant tumors of lymphatic tissue |
| 201.xx | Hodgkin's disease |
| 202.xx | Other malignant neoplasms of lymphoid and histiocytic tissue |
| 203.xx | Multiple myeloma and immunoproliferative neoplasms |
| ***204.xx*** | ***Lymphoid leukemia*** |
| ***205.xx*** | ***Myeloid leukemia*** |
| ***206.xx*** | ***Monocytic leukemia*** |
| ***207.xx*** | ***Other specified leukemia*** |
| ***208.xx*** | ***Leukemia of unspecified cell type*** |
| **ICD-10** | | M8000/3 | Neoplasm, malignant |
| C00.xx | Malignant neoplasm of lip |
| C01.xx | Malignant neoplasm of base of tongue |
| C02.xx | Malignant neoplasm of other and unspecified parts of tongue |
| C03.xx | Malignant neoplasm of gum |
| C04.xx | Malignant neoplasm of floor of mouth |
| C05.xx | Malignant neoplasm of palate |
| C06.xx | Malignant neoplasm of other and unspecified parts of mouth |
| C07.xx | Malignant neoplasm of parotid gland |
| C08.xx | Malignant neoplasm of other and unspecified major salivary glands |
| C09.xx | Malignant neoplasm of tonsil |
| C10.xx | Malignant neoplasm of oropharynx |
| C11.xx | Malignant neoplasm of nasopharynx |
| C12.xx | Malignant neoplasm of piriform sinus |
| C13.xx | Malignant neoplasm of hypopharynx |
| C14.xx | Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx |
| C15.xx | Malignant neoplasm of oesophagus |
| C16.xx | Malignant neoplasm of stomach |
| C17.xx | Malignant neoplasm of small intestine |
| C18.xx | Malignant neoplasm of colon |
| C19.xx | Malignant neoplasm of rectosigmoid junction |
| C20.xx | Malignant neoplasm of rectum |
| C21.xx | Malignant neoplasm of anus and anal canal |
| C22.xx | Malignant neoplasm of liver and intrahepatic bile ducts |
| C23.xx | Malignant neoplasm of gallbladder |
| C24.xx | Malignant neoplasm of other and unspecified parts of biliary tract |
| C25.xx | Malignant neoplasm of pancreas |
| C26.xx | Malignant neoplasm of other and ill-defined digestive organs |
| C30.xx | Malignant neoplasm of nasal cavity and middle ear |
| C31.xx | Malignant neoplasm of accessory sinuses |
| C32.xx | Malignant neoplasm of larynx |
| C33.xx | Malignant neoplasm of trachea |
| C34.xx | Malignant neoplasm of bronchus and lung |
| C37.xx | Malignant neoplasm of thymus |
| C38.xx | Malignant neoplasm of heart, mediastinum and pleura |
| C39.xx | Malignant neoplasm of other and ill-defined sites in the respiratory system and intrathoracic organs |
| C40.xx | Malignant neoplasm of bone and articular cartilage of limbs |
| C41.xx | Malignant neoplasm of bone and articular cartilage of other and unspecified sites |
| C43.xx | Malignant melanoma of skin |
| C45.xx | Mesothelioma |
| C46.xx | Kaposi's sarcoma |
| C47.xx | Malignant neoplasm of peripheral nerves and autonomic nervous system |
| C48.xx | Malignant neoplasm of retroperitoneum and peritoneum |
| C49.xx | Malignant neoplasm of other connective and soft tissue |
| C50.xx | Malignant neoplasm of breast |
| C51.xx | Malignant neoplasm of vulva |
| C52.xx | Malignant neoplasm of vagina |
| C53.xx | Malignant neoplasm of cervix uteri |
| C54.xx | Malignant neoplasm of corpus uteri |
| C55.xx | Malignant neoplasm of uterus, part unspecified |
| C56.xx | Malignant neoplasm of ovary |
| C57.xx | Malignant neoplasm of other and unspecified female genital organs |
| C58.xx | Malignant neoplasm of placenta |
| C60.xx | Malignant neoplasm of penis |
| C61.xx | Malignant neoplasm of prostate |
| C62.xx | Malignant neoplasm of testis |
| C63.xx | Malignant neoplasm of other and unspecified male genital organs |
| C64.xx | Malignant neoplasm of kidney, except renal pelvis |
| C65.xx | Malignant neoplasm of renal pelvis |
| C66.xx | Malignant neoplasm of ureter |
| C67.xx | Malignant neoplasm of bladder |
| C68.xx | Malignant neoplasm of other and unspecified urinary organs |
| C69.xx | Malignant neoplasm of eye and adnexa |
| C70.xx | Malignant neoplasm of meninges |
| C71.xx | Malignant neoplasm of brain |
| C72.xx | Malignant neoplasm of spinal cord, cranial nerves and other parts of central nervous system |
| C73.xx | Malignant neoplasm of spinal cord, cranial nerves and other parts of central nervous system |
| C74.xx | Malignant neoplasm of adrenal gland |
| C75.xx | Malignant neoplasm of other endocrine glands and related structures |
| C76.xx | Malignant neoplasm of other and ill-defined sites |
| C77.xx | Secondary and unspecified malignant neoplasm of lymph nodes |
| C78.xx | Secondary malignant neoplasm of respiratory and digestive organs |
| C79.xx | Secondary malignant neoplasm of other sites |
| C80.xx | Malignant neoplasm without specification of site |
| C81.xx | Hodgkin's disease |
| C82.xx | Follicular [nodular] non-Hodgkin's lymphoma |
| C83.xx | Diffuse non-Hodgkin's lymphoma |
| C84.xx | Peripheral and cutaneous T-cell lymphomas |
| C85.xx | Other and unspecified types of non-Hodgkin's lymphoma |
| C88.xx | Malignant immunoproliferative diseases |
| C90.xx | Multiple myeloma and malignant plasma cell neoplasms |
| ***C91.xx*** | ***Lymphoid leukaemia*** |
| ***C92.xx*** | ***Myeloid leukaemia*** |
| ***C93.xx*** | ***Monocytic leukaemia*** |
| ***C94.xx*** | ***Other leukaemias of specified cell type*** |
| ***C95.xx*** | ***Leukaemia of unspecified cell type*** |
| C96.xx | Other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue |
| C97.xx | Malignant neoplasms of independent (primary) multiple sites |
|  | Procedure | 8511, 8553 | Radiotherapy |

1. **Diabetes**: 1 if the patient had at least one of the following diseases within 3 years before cohort entry

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **ICD-9** | **ICD-10** |
| Diabetes mellitus | | 250 | \*E10, E11, E12, E13, E14 |
|  | Diabetes mellitus without mention of complication | 250.0 | E10.9, E11.9, E12.9, E13.9, E14.9 |
|  | Diabetes with ketoacidosis | 250.1 | E10.1, E11.1, E12.1, E13.1, E14.1 |
|  | Diabetes with hyperosmolarity | 250.2 | - |
|  | Diabetes with other coma | 250.3 | E10.0, E11.0, E12.0, E13.0, E14.0 |
|  | Diabetes with renal manifestations | 250.4 | E10.2, E11.2, E12.2, E13.2, E14.2 |
|  | Diabetes with ophthalmic manifestations | 250.5 | E10.3, E11.3, E12.3, E13.3, E14.3 |
|  | Diabetes with neurological manifestations | 250.6 | E10.4, E11.4, E12.4, E13.4, E14.4 |
|  | Diabetes with peripheral circulatory disorders | 250.7 | E10.5, E11.5, E12.5, E13.5, E14.5 |
|  | Diabetes with other specified manifestations | 250.8 | E10.6, E11.6, E12.6, E13.6, E14.6 |
|  | Diabetes with unspecified complication | 250.9 | E10.8, E11.8, E12.8, E13.8, E14.8 |
|  | Diabetes with multiple complications | - | E10.7, E11.7, E12.7, E13.7, E14.7 |

\* E10: Insulin-dependent diabetes mellitus

E11: Non-insulin-dependent diabetes mellitus

E12: Malnutrition related diabetes mellitus

E13: Other specified diabetes mellitus

E14: Unspecified diabetes mellitus

1. **Heart diseases** (Binary): 1 if the patient had at least one of the following diseases within 3 years before cohort entry

## Valvular disease

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| **Disease of mitral valve** | 394 |  |
| Mitral stenosis | 394.0 | I05.0 |
| Rheumatic mitral insufficiency | 394.1 | I05.1 |
| Mitral stenosis with insufficiency | 394.2 | I05.2 |
| Other and unspecified mitral valve diseases | 394.9 | I05.8 |
| **Disease of aortic valve** |  |  |
| Rheumatic aortic stenosis | 395.0 | I06.0 |
| Rheumatic aortic insufficiency | 395.1 | I06.1 |
| Rheumatic aortic stenosis with insufficiency | 395.2 | I06.2 |
| Other and unspecified rheumatic aortic disease | 395.9 | I06.8, I06.9 |
| **Disease of mitral and aortic valve** |  |  |
| Mitral valve stenosis and aortic valve stenosis | 396.0 | I08.0 |
| Mitral valve stenosis and aortic valve insufficiency | 396.1 | I08.0 |
| Mitral valve insufficiency and aortic valve stenosis | 396.2 | I08.0 |
| Mitral valve insufficiency and aortic valve insufficiency | 396.3 | I08.0 |
| Multiple involvement of mitral and aortic valves | 396.8 | I08.8 |
| Mitral and aortic valve diseases, unspecified | 396.9 | I08.9 |
| **Disease of other endocartial structure** | 397 |  |
| Diseases of other tricuspid valve | 397.0 | I07.1, I07.2, I07.8 |
| Rheumatic diseases of pulmonary valve | 397.1 | I09.89 |
| Rheumatic diseases of endocardium, valve unspecified | 397.9 | I09.1 |
| **Nonrheumatic mitral valve disorders**  **Excluding mitral (valve) disease, failure stenosis**  **When of unspecified cause but with mention of ....** | 424.0 | I34 |
| Mitral (valve) insufficiency |  | I34.0 |
| Mitral (valve) prolapse |  | I34.1 |
| Non rheumatic mitral (valve) stenosis |  | I34.2 |
| Other nonrheumatic mitral valve disorders |  | I34.8 |
| Non rheumatic mitral valve disorder, unspecified |  | I34.9 |
| **Non rheumatic aortic valve disorders**  **Excluding....** | 424.1 | I35 |
| Aortic (valve) stenosis) |  | I35.0 |
| Aortic (valve) insufficiency |  | I35.1 |
| Aortic (valve) stenosis with insufficiency |  | I35.2 |
| Other aortic valve disorders |  | I35.8 |
| Aortic valve disorder, unspecified |  | I35.9 |
| **Pulmonary valve disorders excluding...** | 424.3 | I37 |
| Pulmonary valve stenosis |  | I37.0 |
| Pulmonary valve stenosis |  | I37.1 |
| Pulmonary valve insufficiency |  | I37.2 |
| Other pulmonary valve disorders |  | I35.8 |
| Pulmonary valve disorder, unspecified |  | I35.9 |
| **Endocarditis, valve unspecified including**  **excluding** | 424.90 | I38 |
| **Endocarditis and heart valve disorders in diseases classified elsewhere including...** | 421.1 | I39 |
| Mitral valve disorders in diseases classified elsewhere |  | I39.0 |
| Aortic valve disorders in diseases classified elsewhere |  | I39.1 |
| Tricuspid valve disorders in diseases classified elsewhere |  | I39.2 |
| PUlmonary valve disorders in diseases classified elsewhere |  | I39.3 |
| Multiple valve disorders in diseases classified elsewhere |  | I39.4 |
| Endocarditis, valve unspecified, in diseases classified elsewhere |  | I39.8 |

## Peripheral arterial disease

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **ICD-9** | **ICD-10** |
| Atherosclerosis | | 440 | I70 |
|  | Of aorta | 440.0 | I70.0 |
|  | Of renal artery | 440.1 | I70.1 |
|  | Of native arteries of the extremities | 440.2 | I70.2 |
|  | Of other specified arteries | 440.8 | I70.8 |
|  | Generalized and unspecified atherosclerosis | 440.9 | I70.9 |
| Aortic aneurysm and dissection | | 441 | I71 |
|  | Dissection of aorta | 441.0 | I71.0 |
|  | Thoracic aneurysm, ruptured | 441.1 | I71.1 |
|  | Thoracic aneurysm without mention of rupture | 441.2 | I71.2 |
|  | Abdominal aneurysm, ruptured | 441.3 | I71.3 |
|  | Abdominal aneurysm without mention of rupture | 441.4 | I71.4 |
|  | Aortic aneurysm of unspecified site, ruptured | 441.5 | I71.8 |
|  | Thoracoabdominal aneurysm, ruptured | 441.6 | I71.5 |
|  | Thoracoabdominal aneurysm, without mention of rupture | 441.7 | I71.6 |
|  | Aortic aneurysm of unspecified site without mention of rupture | 441.9 | I71.9 |
| Other aneuvrysm | | 442 | I72 |
|  | Of artery of upper extremity | 442.0 | I72.0 |
|  | Of renal artery | 442.1 | I72.1 |
|  | Of iliac artery | 442.2 | I72.2 |
|  | Of artery of lower extremity | 442.3 | I72.3 |
|  | Of other specified artery | 442.8 | I72.8 |
|  | Of unspecified site | 442.9 | I72.9 |
| Other peripheral vascular disease | | 443 | I73 |
|  | Raynaud's syndrome | 443.0 | I73.0 |
|  | Thromboangiitis obliterans [Buerger's disease] | 443.1 | I73.1 |
|  | Other specified peripheral vascular diseases | 443.8 | I73.8 |
|  | Peripheral vascular disease, unspecified | 443.9 | I73.9 |
| Arterial embolism and thrombosis | | 444 | I74 |
|  | Of abdominal aorta | 444.0 | I74.0 |
|  | Of thoracic aorta | 444.1 | I74.1 |
|  | Of arteries of the extremities | 444.2 | I74.4 |
|  | **of arteries of upper extremities** | - | I74.2 |
|  | **of arteries of lower extremities** | - | I74.3 |
|  | **of iliac artery** | - | I74.5 |
|  | Of other specified artery | 444.8 | I74.8 |
|  | Of unspecified artery | 444.9 | I74.9 |
| Polyarteritis nodosa and allied conditions | | 446 | M30 |
|  | Giant cell arteritis | 446.5 | M31.5, M31.6 |
|  | Takayasu's disease | 446.7 | M31.4 |

## Cardiomyopathy

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| **Cardiomyopathy** |  | I42 |
| Dilated cardiomyopathy including congestive cardiomyopathy | 425.4 | I42.0 |
| Obstructive hypertrophic cardiomyopathy including hypertrophic subaortic stenosis | 425.11 | I42.1 |
| Other hypertrophic cardiomyopathy including nonobstructive hypertrophic cardiomyopathy | 425.18 | I42.2 |
| Endomyocardial (eosinophilic) disease including endomyocardial (tropical) fibrosis, löffler encarditis | 425.0 | I42.3 |
| Endocardial fibroelastosis including congenital cardiomyopathy | 425.3 | I42.4 |
| Other restrictive cardiomyopathy including constrictive cardiomyopathy NOS | 425.4 | I42.5 |
| Alcoholic cardiomyopathy | 425.5 | I42.6 |
| Cardiomyopathy due to drugs and other external agents | 425.9 | I42.7 |
| Other cardiomyopathies | 425.2, 425.4 | I42.8 |
| Cardiomyopathy, unspecified including cardiomyopathy (primary) (secondary) NOS | 425.4, 425.9 | I42.9 |
| **Cardiomyopathy in disease classified elsewhere** | 425.8 | I43 |
| Cardiomyopathy in infectious and parasitic diseases classified elsewhere including cardiomyopathy in diphteria |  | I43.0 |
| Cardiomyopathy in metabolic diseases including cardiac amyloidosis |  | I43.1 |
| Cardiomypathy in nutritional diseases including nutritional cardiomyopathy NOS |  | I43.2 |
| Cardiomyopathy in other diseases classified elsewhere including gouty tophi of heart, thyrotoxic heart disease |  | I43.8 |

## Congestive heart failure

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **ICD-9** | **ICD-10** |
|  | Congestive heart failure, unspecified | 428.0 | I50.0 |

## Acute myocardial infarction

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **ICD-9** | **ICD-10** |
|  | Acute myocardial infarction | 410 | I21 |

1. **COPD/asthma** (Binary): 1 if the patient had at least one of the following diseases within 3 years before cohort entry

|  |  |  |
| --- | --- | --- |
|  | **Code** | **Disease** |
| **ICD-9** | 490.xx | Bronchitis NOS |
| 491.0 | Simple chronic bronchitis |
| 491.1 | Mucopurul chr bronchitis |
| 491.2 | Ob chr bronch w/o acute exacerb |
| 491.8 | Chronic bronchitis NEC |
| 491.9 | Chronic bronchitis NOS |
| 492.0 | Emphysematous bleb |
| 492.8 | Emphysema NEC |
| 493.0 | Ext asthma |
| 493.1 | Int asthma |
| 493.2 | Chronic obstructive asthma |
| 493.9 | Asthma w/ or w/o status asthma |
| 494.xx | Bronchiectasis |
| 496.xx | Chr airway obstruct NEC |
| **ICD-10** | J40 | Bronchitis, not specified as acute or chronic |
| J41.x | Simple and mucopurulent chronic bronchitis |
| J42 | Unspecified chronic bronchitis |
| J43.x | Emphysema |
| J44.x | Other chronic obstructive pulmonary disease |
| J45.x | Asthma |

1. **Dyslipidemia**: (Binary): 1 if the patient had at least one of the following diseases within 3 years before cohort entry

|  |  |  |
| --- | --- | --- |
|  | **ICD-9** | **ICD-10** |
| Disorders of lipoid metabolism | 272 | E78 |
| Pure hypercholesterolemia | 272.0 | E78.0 |
| Pure hyperglyceridemia | 272.1 | E78.1 |
| Mixed hyperlipidemia | 272.2 | E78.2 |
| Hyperchylomicronemia | 272.3 | E78.3 |
| Other and unspecified hyperlipidemia | 272.4 | E78.4, E78.5 |
| Lipoprotein deficiencies | 272.5 | E78.6 |
| Lipodystrophy | 272.6 | E78.8, E78.9 |
| Lipidoses | 272.7 | E78.8, E78.9 |
| Other disorders of lipoid metabolism | 272.8 | E78.8, E78.9 |
| Unspecified disorder of lipoid metabolism | 272.9 | E78.8, E78.9 |

1. OAC information:
2. **OAC type** (Binary): 1 if the patient was prescribed DOAC, 0 if the patient was prescribed warfarin at cohort entry
3. **Apixaban** (Binary): 1 if the patient was prescribed Apixaban at cohort entry, 0 otherwise
4. **Dabigatran** (Binary): 1 if the patient was prescribed Dabigatran at cohort entry, 0 otherwise
5. **Adherence** (binary): 1 if the patient’s adherence level was greater than or equal to 0.8, being categorized as high adherence level

The adherence level was measured among patients who received a diagnosis of hypertension within the 3 months prior to index date. The adherence was calculated as the number of days of dispensed hypertension drugs divided by the duration of period (year preceding the index date).

The hypotensive drugs (dénomination commune) included: bendrofluméthiazide, eprosartan (mésylate d')/hydrochlorothiazide, amlodipine (bésylate d'), diltiazem (chlorhydrate de), felodipine, nifedipine, vérapamil (chlorhydrate de), verapamil (chlorhydrate de), acébutolol (chlorhydrate d'), atenolol, bisoprolol (fumarate de), labetalol (chlorhydrate de), métoprolol (tartrate de), nadolol, oxprénolol (chlorhydrate d'), pindolol, propranolol (chlorhydrate de), éthacrynique (acide), amiloride (chlorhydrate d'), chlorthalidone, hydrochlorothiazide, indapamide, metolazone, spironolactone, bumetanide, triamterene, torsemide, bénazépril (chlorhydrate de), captopril, cilazapril, énalapril (maléate d'), fosinopril sodique, lisinopril, périndopril erbumine, quinapril (chlorhydrate de), ramipril, trandolapril, candésartan cilexétil, éprosartan (mésylate d'), irbesartan, losartan potassique, telmisartan, valsartan, amiloride (chlorhydrate d')/ hydrochlorothiazide, candésartan cilexetil/ hydrochlorothiazide, cilazapril/ hydrochlorothiazide, énalapril (maléate d')/ hydrochlorothiazide, irbesartan/ hydrochlorothiazide, lisinopril/ hydrochlorothiazide, losartan potassique/ hydrochlorothiazide, périndopril erbumine/indapamide, pindolol / hydrochlorothiazide, quinapril (chlorhydrate de) / hydrochlorothiazide, spironolactone/ hydrochlorothiazide, telmisartan/ hydrochlorothiazide, trandolapril/ vérapamil (chlorhydrate de), triamtérène/ hydrochlorothiazide, valsartan/hydrochlorothiazide, atenolol/chlorthalidone, éprosartan (mésylate d')/ hydrochlorothiazide, ramipril/ hydrochlorothiazide, timolol (maléate de)

1. **Dose** (Binary): 1 if the patient was prescribed high dose DOAC at cohort entry, 0 otherwise
2. Concomitant medications:
3. **Antiplatelet** (Binary): 1 if the patient had at least 1 dispensation of antiplatelet within the 2 weeks prior to index date.

The antiplatelet drugs (dénomination commune) included: clopidogrel, dipyridamole, acetylsalicylique acide/ dipyridamole, prasugrel, ticlopidine (chlorhydrate de), acétylsalicylique (acide)

1. **NSAIDs** (Binary): 1 if the patient had at least 1 dispensation of NSAID within the 2 weeks prior to index date.

The NSAID drugs (dénomination commune) included: acétylsalicylique (acide), acétylsalicylique (acide)/ codéine (phosphate de), celecoxib, diclofénac (potassique ou sodique), diclofénac sodique/misoprostol, diflunisal, etodolac, fenoprofène calcique, flurbiprofène, ibuprofène, ibuprofène/ pseudoéphédrine (chlorhydrate de), indométhacine, kétoprofène, méfénamique (acide), meloxicam, nabumétone, naproxène, naproxène/ésoméprazole, phenylbutazone, piroxicam, rofécoxib, salsalate, sulindac, tenoxicam, tiaprofénique (acide)

1. **PPIs** (Binary): 1 if the patient had at least 1 dispensation of Proton pump inhibitors within the 2 weeks prior to index date.

The PPI drugs (dénomination commune) included: dexlansoprazole, esoméprazole (magnésium trihydraté), lansoprazole, oméprazole, oméprazole (base ou magnésien), pantoprazole (magnésien ou sodique), pantoprazole sodique, rabéprazole sodique

1. **Antidepressants** (Binary): 1 if the patient had at least 1 dispensation of antidepressant within the 2 weeks prior to index date.

The antidepressant drugs (dénomination commune) included: citalopram (bromhydrate de), escitalopram oxalate, fluoxétine (chlorhydrate de), fluvoxamine (maléate de), néfazodone (chlorhydrate de), paroxétine (chlorhydrate de), sertraline (chlorhydrate de), venlafaxine (chlorhydrate de), amitriptyline (chlorhydrate d'), amitriptyline (pamoate d'), bupropion (chlorhydrate de), clomipramine (chlorhydrate de), désipramine (chlorhydrate de), doxépine (chlorhydrate de), duloxétine, imipramine (chlorhydrate d'), l-tryptophane, maprotiline (chlorhydrate de), mirtazapine, moclobémide, nortriptyline (chlorhydrate de), phénelzine (sulfate de), protriptyline (chlorhydrate de), tranylcypromine (sulfate de), trazodone (chlorhydrate de), trimipramine

1. **Drugs** (binary): 1 if the patient had at least 1 dispensation of the following drugs in the 3 years preceding the index date or during the AF hospitalization

Clopidogrel, low dose of ASA (daily dose < 100 mg), NSAID (dénomination commune: acétylsalicylique (acide), acétylsalicylique (acide)/ codéine (phosphate de), celecoxib, diclofénac (potassique ou sodique), diclofénac sodique/misoprostol, diflunisal, etodolac, fenoprofène calcique, flurbiprofène, ibuprofène, ibuprofène/ pseudoéphédrine (chlorhydrate de), indométhacine, kétoprofène, méfénamique (acide), meloxicam, nabumétone, naproxène, naproxène/ésoméprazole, phenylbutazone, piroxicam, rofécoxib, salsalate, sulindac, tenoxicam, tiaprofénique (acide))

1. **Other** **medications** (Binary): 1 if the patient had at least 1 dispensation of the following drugs within the 2 weeks prior to index date

Antidiabetics, Antidepressants, PPIs, Antibiotics, Antiarrhythmics, PGP inhibitors

1. Interactions:
2. **Interaction of OAC type and Adherence**
3. **Interaction of Dose and Adherence**
4. **Interaction of OAC type and Antiplatelet**
5. **Interaction of OAC type and NSAIDs**
6. **Interaction of OAC type and PPIs**
7. **Interaction of OAC type and Antidepressants**