### eTable 1. List of Variable and Endpoint Codes*

| Variable                                      | Code(s)          | Code Description† |
|-----------------------------------------------|------------------|-------------------|
| Atrial fibrillation                           | I48              | ICD-10 Diagnosis  |
| Acute kidney injury                           | N00, N00.1, N00.2, N00.3, N00.4, N00.5, N00.6, N00.7, N00.8, N00.9, N01, N01.0, N01.1, N01.2, N01.3, N01.4, N01.5, N01.6, N01.7, N01.8, N01.9, N17, N17.0, N17.1, N17.2, N17.8, N17.9 | ICD-10 Diagnosis |
| Stage 5 CKD or need for dialysis              | N185, N186, Z992, Z49, Z452, Z940, l120, 90935-90999 | ICD-10 Diagnosis and Procedure |
| Ischemic stroke                               | I63              | ICD-10 Diagnosis  |
| Intracranial hemorrhage                       | I60-162          | ICD-10 Diagnosis  |
| Systemic embolism                             | I74              | ICD-10 Diagnosis  |
| Major adverse limb event                      | 00-55, 17-56, 39-50, 39.90, 39.25, 39.26, 39.39, 84.13, 84.14, 84.15, 84.16, 84.17 | ICD-9 Procedure† |
| Mitral stenosis                               | I05, I08.0, I08.1, I08.3, I08.8, I08.9, I34.2, Q23.2 | ICD-10 Diagnosis |
| Mechanical heart valve                        | Z95.2-Z95.4      | ICD-10 Diagnosis  |
| Heart valve complications                     | T82.0, T82.22, T82.827, T82.847, T82.857, T82.867, T82.897, T82.9 | ICD-10 Diagnosis |
| Aortic valve replacement                      | 33405, 33406, 33410, 33411, 33412, 33413 | CPT-4 Procedure |
| Transcatheter aortic valve replacement        | 33361-33369      | CPT-4 Procedure   |
| Pulmonary valve replacement                   | 33475            | CPT-4 Procedure   |
| Mitral valve replacement                      | 33430            | CPT-4 Procedure   |
| Tricuspid valve replacement                   | 33465            | CPT-4 Procedure   |
| Valvotomy/valvuloplasty for mitral stenosis   | 33420, 33422, 33425, 33426, 33427, 92987 | CPT-4 Procedure |
| Heart failure                                 | I09.9, I11.0, I13.0, I13.2, I25.5, I42.0, I42.5-I42.9, I43.x, I50.x, P29.0 | ICD-10 Diagnosis |
| Hypertension                                  | I10.x, I11.x-I13.x, I15.x, I16.x | ICD-10 Diagnosis |
| Diabetes mellitus                             | E10.0, E10.1, E10.9, E11.0, E11.1, E11.9, E12.0, E12.1, 12.9, E13.0, E13.1, E13.9, E10.2-E10.8, E11.2-E11.8, E12.2-E12.8, E13.2-E13.8, E14.0-E14.9 | ICD-10 Diagnosis |
| Stroke                                        | I60.x, I61.x, I62.x, I63.x | ICD-10 Diagnosis |
| Transient ischemic attack                     | G45.0, G45.1, G45.2, G45.4, G45.8, G45.9 | ICD-10 Diagnosis |
| Peripheral arterial disease                   | E08.51, E08.52, E09.51, E09.52, E10.51, E10.52, E11.51, E11.52, E13.51, E13.52, I70.0, I70.1, I70.201, I70.202, I70.203, I70.208, I70.209, I70.211, I70.212, I70.213, I70.218, I70.219, I70.221, I70.222, I70.223, I70.228, I70.229, I70.231, I70.232, I70.233, I70.234, I70.235, I70.236, I70.239, I70.241, I70.242, I70.243, I70.244, I70.245, I70.246, I70.248, I70.249, I70.25, I70.291, I70.292, I70.293, I70.298, I70.299, I70.92, I73.81, I73.89, I73.9, I79.1, I79.8 | ICD-10 Diagnosis |
| Myocardial infarction                          | I21, I21.0, I21.01, I21.02, I21.09, I21.1, I21.11, I21.19, I21.2, I21.21, I21.29, I21.3, I21.4, I22, I22.0, I22.1, I22.2, I22.8, I22.9 | ICD-10 Diagnosis |
| Procedure                                      | ICD-10 Diagnosis and Procedure | ICD-10 Procedure |
|------------------------------------------------|--------------------------------|-----------------|
| Percutaneous coronary intervention             | Z98.61, Z95.5, 92920, 92921, 92924, 92925, 92928, 92929, 92933, 92934, 92937, 92938, 92941, 92943, 92944, 02700D6, 02700DZ, 02700T6, 02700TZ, 02700Z6, 02700ZZ, 02703D6, 02703DZ, 02703T6, 02703TZ, 02703Z6, 02703ZZ, 02704D6, 02704DZ, 02704T6, 02704TZ, 02704Z6, 02704ZZ, 02710D6, 02710DZ, 02710T6, 02710TZ, 02710Z6, 02710ZZ, 02713D6, 02713DZ, 02713T6, 02713TZ, 02713Z6, 02713ZZ, 02714D6, 02714DZ, 02714T6, 02714TZ, 02714Z6, 02714ZZ, 02720D6, 02720DZ, 02720T6, 02720TZ, 02720Z6, 02720ZZ, 02723D6, 02723DZ, 02723T6, 02723TZ, 02723Z6, 02723ZZ, 02724D6, 02724DZ, 02724T6, 02724TZ, 02724Z6, 02724ZZ, 02730D6, 02730DZ, 02730T6, 02730TZ, 02730Z6, 02730ZZ, 02733D6, 02733DZ, 02733T6, 02733TZ, 02733Z6, 02733ZZ, 02734D6, 02734DZ, 02734T6, 02734TZ, 02734Z6, 02734ZZ, 02743D6, 02743DZ, 02743T6, 02743TZ, 02743Z6, 02743ZZ, C9600, C9601, C9602, C9603, C9604, C9605, C9606, C9607, C9608, 0270046, 027004Z, 0270346, 027034Z, 0270446, 027044Z, 0271046, 027104Z, 0271346, 027134Z, 0271446, 027144Z, 0272046, 027204Z, 0272346, 027234Z, 0272446, 027244Z, 0273046, 027304Z, 0273346, 027334Z, 0273446, 027344Z. | | |
| Gastrointestinal bleeding | Per Cunningham Algorithm cross-walked using CMS General Equivalence Mapping from cms.gov | ICD-10 Diagnosis |
|--------------------------|-----------------------------------------------------------------|-----------------|
| **Chronic kidney disease** | N07.1, N07.2, N07.3, N07.4, N07.5, N07.6, N07.7, N07.8, N07.9, N08, N12.1, N12.2, N12.30, N12.39, N14.0, N14.1, N14.2, N14.3, N14.4, N15.0, N15.8, N15.9, N16, N17.0, N17.1, N17.2, N17.8, N17.9, N18.1, N18.2, N18.3, N18.4, N18.5, N18.6, N18.9, N19, N25.0, N25.1, N25.81, N25.89, N25.9, N26.1, N26.9, N61.02, N61.11, N61.19, N61.2, N61.3, N61.4, N61.5, N61.8, N62.0, N62.2, N62.10, N62.11, N62.12, N62.31, N62.32, N62.39, N94.4, M10.379, M10.38, M10.39, M32.14, M32.15, M35.04, N00.0, N00.1, N00.2, N00.3, N00.4, N00.5, N00.6, N00.7, N00.8, N00.9, N01.0, N01.1, N01.2, N01.3, N01.4, N01.5, N01.6, N01.7, N01.8, N01.9, N02.0, N02.1, N02.2, N02.3, N02.4, N02.5, N02.6, N02.7, N02.8, N02.9, N03.0, N03.1, N03.2, N03.3, N03.4, N03.5, N03.6, N03.7, N03.8, N03.9, N04.0, N04.1, N04.2, N04.3, N04.4, N04.5, N04.6, N04.7, N04.8, N04.9, N05.0, N05.1, N05.2, N05.3, N05.4, N05.5, N05.6, N05.7, N05.8, N05.9, N06.0, N06.1, N06.2, N06.3, N06.4, N06.5, N06.6, N06.7, N06.8, N06.9, N07.0, A18.11, A52.75, B52.0, C64.1, C64.2, C64.9, C68.9, D30.00, D30.01, D30.02, D41.00, D41.01, D41.02, D41.10, D41.11, D41.12, D41.20, D41.21, D41.22, D59.3, E08.21, E08.22, E08.29, E08.65, E09.21, E09.22, E09.29, E10.21, E10.22, E10.29, E10.65, E11.21, E11.22, E11.29, E11.65, E13.21, E13.22, E13.29, E74.8, I20.0, I3.11, I3.2, I70.1 | ICD-10 Diagnosis |
| Condition                                      | ICD-10 Codes                                                                 | Category                        |
|------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------|
| End-stage renal disease                        | N18.5, N18.6                                                                 | ICD-10 Diagnosis                |
| Liver disease                                  | K730, K731, K732, K738, K739, B150, B159, B160, B161, B162, B169, B170, B1710, B1711, B172, B178, B179, B180, B181, B182, B188, B189, K7030, K740, K7460, K7469 | ICD-10 Diagnosis                |
| Coagulopathy                                  | D65-D68.x, D69.1, D69.3-D69.6                                                | ICD-10 Diagnosis                |
| Gastroesophageal reflux disease                | K21, K21.9, R12                                                              | ICD-10 Diagnosis                |
| Upper gastrointestinal testing                | 0355T, 3130F, 3132F, 43200, 43201, 43202, 43204, 43205, 43219, 43220, 43226, 43233, 43234, 43235, 43236, 43237, 43238, 43239, 43241, 43242, 43245, 43248, 43249, 43257, 43259, 44360, 44361, 44363, 44364, 44365, 44366, 44369, 44370, 44372, 44373, 44376, 44377, 44378, 44379, 44380, 44381, 44382, 44384, 76975, 91110, 91111, 92612, 92613, A4270, C1749, C9703, G0193, S2215 | ICD-10 Procedure                |
| Anemia                                         | D50.0, D50.1, D50.8, D50.9, D51.0, D51.1, D51.2, D51.3, D51.8, D51.9, D52.0, D52.1, D52.8, D52.9, D53.0, D53.1, D53.2, D53.8, D53.9, D55.0, D55.1, D55.2, D55.3, D55.8, D55.9, D56.0, D56.1, D56.2, D56.3, D56.4, D56.5, D56.8, D56.9, D57.00, D57.01, D57.02, D57.1, D57.20, D57.211, D57.212, D57.219, D57.3, D57.40, D57.411, D57.412, D57.419, D57.80, D57.811, D57.812, D57.819, D58.0, D58.1, D58.2, D58.8, D58.9, D59.0, D59.1, D59.2, D59.3, D59.4, D59.5, D59.6, D59.8, D59.9, D60.0, D60.1, D60.8, D60.9, D61.01, D61.09, D61.1, D61.12, D61.3, D61.810, D61.811, D61.818, D61.82, D61.83, D61.9, D62, D63.0, D63.1, D63.8, D64.0, D64.1, D64.2, D64.3, D64.4, D64.81, D64.89, D64.9 | ICD-10 Diagnosis                |
| Asthma                                         | J45, J45.2, J45.20, J45.21, J45.22, J45.3, J45.30, J45.31, J45.32, J45.4, J45.40, J45.41, J45.42, J45.5, J45.50, J45.51, J45.52, J45.9, J45.90, J45.901, J45.909, J45.991, J45.998 | ICD-10 Diagnosis                |
| Chronic obstructive pulmonary disease          | J44, J44.0, J44.1, J44.9                                                    | ICD-10 Diagnosis                |
| Sleep apnea                                   | G47.3, G47.30, G47.31, G47.32, G47.33, G47.34, G47.35, G47.36, G47.37, G47.39 | ICD-10 Diagnosis                |
| Smoker                                         | F17.20, F17.200, F17.201, F17.203, F17.208, F17.209, F17.21, F17.210, F17.211, F17.213, F17.218, F17.219, F17.29, F17.290, F17.291, F17.293, F17.298, F17.299, Z72.0 | ICD-10 Diagnosis                |
| Hemorrhoids                                   | K64.0, K64.1, K64.2, K64.3, K64.4, K64.8, K64.9                            | ICD-10 Diagnosis                |
| Alcohol abuse                                 | K700, K7010, K7011, K702, K7030, K7031, K7040, K7041, K7042, K709          | ICD-10 Diagnosis                |
| Anxiety                                        | F06.4, F40.00, F40.01, F40.02, F40.10, F40.13, F40.210, F40.218, F40.220, F40.228, F40.230, F40.231, F40.232, F40.233, F40.240, F40.243, F40.242, F40.243, F40.248, F40.290, F40.291, F40.298, F40.8, F40.9, F42.0, F41.1, F41.3, F41.8, F42.0, F42.2, F42.3, F42.4, F42.8, F42.9, F43.0, F43.10, F43.11, F43.12, F44.9, F45.2, F45.8, F45.8, F48.8, F48.9, F93.8, F99, R45.2, R45.5, R45.6, R45.7 | ICD-10 Diagnosis                |
| Depression                                    | F20.4, F31.3-F31.5, F32.8, F33.x, F34.1, F41.2, F43.2                       | ICD-10 Diagnosis                |
| Psychosis | F20.x, F22.x-F25.x, F28.x, F29.x, F30.2, F31.2, F31.5 | ICD-10 Diagnosis |
|-----------|--------------------------------------------------------|------------------|
| Obesity   | E66.01, E66.09, E66.1, E66.8, E66.9, Z68.30, Z68.31, Z68.32, Z68.33, Z68.34, Z68.35, Z68.36, Z68.37, Z68.38, Z68.39, Z68.41, Z68.42, Z68.43, Z68.44, Z68.45 | ICD-10 Diagnosis |
| Osteoarthritis | M05.00, M05.011, M05.012, M05.019, M05.021, M05.022, M05.029, M05.033, M05.032, M05.039, M05.041, M05.042, M05.049, M05.051, M05.052, M05.059, M05.061, M05.062, M05.069, M05.071, M05.072, M05.079, M05.09, M05.20, M05.211, M05.212, M05.219, M05.221, M05.222, M05.229, M05.231, M05.232, M05.239, M05.241, M05.242, M05.249, M05.251, M05.252, M05.259, M05.261, M05.262, M05.269, M05.271, M05.272, M05.279, M05.29, M05.30, M05.311, M05.312, M05.319, M05.321, M05.322, M05.329, M05.331, M05.332, M05.339, M05.344, M05.342, M05.349, M05.351, M05.352, M05.359, M05.361, M05.362, M05.369, M05.371, M05.372, M05.379, M05.39, M05.40, M05.411, M05.412, M05.449, M05.421, M05.422, M05.429, M05.431, M05.432, M05.439, M05.441, M05.442, M05.449, M05.451, M05.452, M05.459, M05.461, M05.462, M05.469, M05.471, M05.472, M05.479, M05.49, M05.50, M05.511, M05.512, M05.519, M05.521, M05.522, M05.529, M05.531, M05.532, M05.539, M05.541, M05.542, M05.549, M05.551, M05.552, M05.559, M05.561, M05.562, M05.569, M05.571, M05.572, M05.579, M05.59, M05.60, M05.611, M05.612, M05.619, M05.621, M05.622, M05.629, M05.631, M05.632, M05.639, M05.641, M05.642, M05.649, M05.651, M05.652, M05.659, M05.663, M05.662, M05.669, M05.671, M05.672, M05.679, M05.69, M05.70, M05.711, M05.712, M05.719, M05.721, M05.722, M05.729, M05.731, M05.732, M05.739, M05.741, M05.742, M05.749, M05.751, M05.752, M05.759, M05.761, M05.762, M05.769, M05.771, M05.772, M05.779, M05.79, M05.80, M05.821, M05.812, M05.819, M05.821, M05.822, M05.829, M05.831, M05.832, M05.839, M05.841, M05.842, M05.849, M05.851, M05.852, M05.859, M05.861, M05.862, M05.869, M05.871, M05.872, M05.879, M05.89, M05.9, M06.00, M06.011, M06.012, M06.019, M06.021, M06.022, M06.029, M06.031, M06.032, M06.039, M06.041, M06.042, M06.049, M06.051, M06.052, M06.059, M06.061, M06.062, M06.069, M06.071, M06.072, M06.079, M06.08, M06.09, M06.1, M06.20, M06.211, M06.212, M06.219, M06.221, M06.222, M06.229, M06.231, M06.232, M06.239, M06.241, M06.242, M06.249, M06.251, M06.252, M06.259, M06.261, M06.262, M06.269, M06.271, M06.272, M06.279, M06.28, M06.29, M06.30, M06.311, M06.312, M06.319, M06.321, M06.322, M06.329, M06.333, M06.332, M06.339, M06.341, M06.342, M06.349, M06.354, M06.352, M06.359, M06.361, M06.362, M06.369, M06.371, M06.372, M06.379, M06.38, M06.39, M06.80, M06.811, M06.812, M06.819, M06.821, M06.822, M06.829, M06.831, M06.832, M06.839, M06.841, M06.842, M06.849, M06.851, M06.852, M06.859, M06.861, M06.862, M06.869, M06.871, M06.872, M06.879, M06.88, M06.89, M06.9, M08.00, M08.011, M08.012, M08.019, M08.021, |
- **Back pain**: M08.022, M08.029, M08.031, M08.032, M08.039, M08.041, M08.042, M08.049, M08.051, M08.052, M08.059, M08.061, M08.062, M08.069, M08.071, M08.072, M08.079, M08.08, M08.09, M08.1, M08.20, M08.211, M08.212, M08.219, M08.221, M08.222, M08.229, M08.231, M08.232, M08.239, M08.241, M08.242, M08.249, M08.251, M08.252, M08.259, M08.261, M08.262, M08.269, M08.271, M08.272, M08.279, M08.28, M08.29, M08.3, M08.40, M08.411, M08.412, M08.419, M08.421, M08.422, M08.429, M08.431, M08.432, M08.439, M08.441, M08.442, M08.449, M08.451, M08.452, M08.459, M08.461, M08.462, M08.469, M08.471, M08.472, M08.479, M08.48, M08.80, M08.811, M08.812, M08.819, M08.821, M08.822, M08.829, M08.831, M08.832, M08.839, M08.841, M08.842, M08.849, M08.851, M08.852, M08.859, M08.861, M08.862, M08.869, M08.871, M08.872, M08.879, M08.88, M08.89, M08.90, M08.911, M08.912, M08.919, M08.921, M08.922, M08.929, M08.931, M08.932, M08.939, M08.941, M08.942, M08.949, M08.951, M08.952, M08.959, M08.961, M08.962, M08.969, M08.971, M08.972, M08.979, M08.98, M08.99, M15.0, M15.1, M15.2, M15.3, M15.4, M15.8, M15.9, M16.0, M16.10, M16.11, M16.12, M16.2, M16.30, M16.31, M16.32, M16.4, M16.50, M16.51, M16.52, M16.6, M16.7, M16.9, M17.0, M17.10, M17.11, M17.12, M17.2, M17.30, M17.31, M17.32, M17.4, M17.5, M17.9, M18.0, M18.10, M18.11, M18.12, M18.2, M18.30, M18.31, M18.32, M18.4, M18.50, M18.51, M18.52, M18.9, M19.011, M19.012, M19.019, M19.021, M19.022, M19.029, M19.031, M19.032, M19.039, M19.041, M19.042, M19.049, M19.071, M19.072, M19.079, M19.111, M19.112, M19.119, M19.121, M19.122, M19.129, M19.131, M19.132, M19.139, M19.141, M19.142, M19.149, M19.171, M19.172, M19.179, M19.211, M19.212, M19.219, M19.221, M19.222, M19.229, M19.231, M19.232, M19.239, M19.241, M19.242, M19.249, M19.271, M19.272, M19.279, M19.90, M19.91, M19.92, M19.93, M45.0, M45.1, M45.2, M45.3, M45.4, M45.5, M45.6, M45.7, M45.8, M45.9, M47.011, M47.012, M47.013, M47.014, M47.015, M47.016, M47.019, M47.021, M47.022, M47.029, M47.10, M47.11, M47.12, M47.13, M47.20, M47.21, M47.22, M47.23, M47.24, M47.25, M47.26, M47.27, M47.28, M47.811, M47.812, M47.813, M47.814, M47.815, M47.816, M47.817, M47.818, M47.819, M47.891, M47.892, M47.893, M47.894, M47.895, M47.896, M47.897, M47.898, M47.899, M47.9, M48.8X1, M48.8X2, M48.8X3, M48.8X4, M48.8X5, M48.8X6, M48.8X7, M48.8X8, M48.8X9  

- **ICD-10 Diagnosis**

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- **Joint pain and stiffness**: M255, M2550, M25511, M25512, M25519, M25521, M25522, M25529, M25531, M25532, M25539, M25551, M25552, M25559, M25561, M25562, M25569, M25571, M25572, M25579, M256, M2560, M25611, M25612, M25619, M25621, M25622, M25629, M25631, M25632, M25639, M25641, M25642, M25649, M25654, M25652, M25659, M25661, M25662, M25669, M25671, M25672, M25673  

- **ICD-10 Diagnosis**
| Condition                          | ICD-10 Codes                                                                 | ICD-10 Diagnosis |
|-----------------------------------|-----------------------------------------------------------------------------|------------------|
| Headache                          | G43.001, G43.009, G43.011, G43.019, G43.101, G43.109, G43.111, G43.119, G43.121, G43.129, G43.131, G43.139, G43.141, G43.149, G43.501, G43.509, G43.511, G43.519, G43.601, G43.609, G43.611, G43.619, G43.701, G43.709, G43.711, G43.719, G43.A0, G43.B0, G43.C0, G43.D0, G43.A1, G43.B1, G43.C1, G43.D2, G43.801, G43.809, G43.811, G43.819, G43.821, G43.829, G43.831, G43.839, G43.901, G43.909, G43.911, G43.919, G44.001, G44.009, G44.011, G44.019, G44.021, G44.029, G44.031, G44.039, G44.041, G44.049, G44.051, G44.059, G44.091, G44.099, G44.1, G44.201, G44.209, G44.211, G44.219, G44.221, G44.229, G44.301, G44.309, G44.311, G44.319, G44.321, G44.329, G44.40, G44.41, G44.42, G44.51, G44.52, G44.53, G44.59, G44.81, G44.82, G44.83, G44.84, G44.85, G44.89 | ICD-10 Diagnosis |
| Diverticulitis                     | K57.00, K57.10, K57.12, K57.20, K57.30, K57.32, K57.40, K57.50, K57.52, K57.80, K57.90, K57.92 | ICD-10 Diagnosis |
| Crohns or ulcerative colitis       | K5000, K50011, K50012, K50012, K50013, K50013, K50014, K50014, K50018, K50019, K5010, K50111, K50112, K50112, K50113, K50113, K50114, K50114, K50118, K50118, K50119, K50119, K5080, K50811, K50812, K50812, K50813, K50813, K50814, K50814, K50818, K50818, K50819, K5100, K51011, K51012, K51012, K51013, K51013, K51014, K51014, K51018, K51018, K51019, K5120, K51211, K51212, K51212, K51213, K51213, K51214, K51214, K51218, K51219, K51310, K51311, K51311, K51312, K51312, K51313, K51313, K51314, K51314, K51318, K51318, K51319, K5140, K51411, K51412, K51412, K51413, K51413, K51414, K51414, K51418, K51419, K5150, K51511, K51512, K51512, K51513, K51513, K51514, K51514, K51518, K51519, K5180, K51811, K51812, K51812, K51813, K51813, K51814, K51814, K51816, K51819, K5190, K51911, K51912, K51912, K51913, K51913, K51914, K51914, K51918, K51919 | ICD-10 Diagnosis |
| Helicobacter pylori                | B9681                                                                       | ICD-10 Diagnosis |
| Hypothyroidism                    | E00.x-E03.x, E89.0                                                          | ICD-10 Diagnosis |
| Solid tumor                       | C00.x-C26.x, C30.x-C34.x, C37.x-C41.x, C43.x, C45.x-58.x, C60.x-C76.x, C97.x | ICD-10 Diagnosis |
| Lymphoma                          | C81.x-C83.x, C88.x, C96.x, C90.0, C90.2                                     | ICD-10 Diagnosis |
| Metastatic cancer                 | C77.x-C80.x                                                                 | ICD-10 Diagnosis |

*Code position and associated healthcare encounter for endpoints-of-interest are described further in the main publication text.*

†Any ICD-9 codes were converted to ICD-10 using the Centers for Medicare and Medicaid Services (CMS) General Equivalence Mappings (GEMs) files available at: [https://www.cms.gov/Medicare/Coding/ICD10/2018-ICD-10-CM-and-GEMs.html](https://www.cms.gov/Medicare/Coding/ICD10/2018-ICD-10-CM-and-GEMs.html) (Last accessed on May 17, 2019).
| Variable (Oral Anticoagulant) | Code/Name | Description          |
|-------------------------------|-----------|----------------------|
| Warfarin                      | Warfarin  | Generic drug name    |
| Apixaban                      | Apixaban  | Generic drug name    |
| Dabigatran                    | Dabigatran| Generic drug name    |
| Edoxaban                      | Edoxaban  | Generic drug name    |
| Rivaroxaban                   | Rivaroxaban| Generic drug name   |
| Betrixaban                    | Betrixaban| Generic drug name    |
| Variable (Medication) | Code/Name | Description |
|-----------------------|-----------|-------------|
| Aspirin | Acetaminophen/Aluminum Hydroxide/Aspirin/Caffeine, Acetaminophen/Aspirin, Acetaminophen/Aspirin, Buffered, Acetaminophen/Aspirin/Caffeine, Acetaminophen/Aspirin/Caffeine/Codeine Phosphate, Acetaminophen/Aspirin/Caffeine/Salicylamide, Acetaminophen/Atropine Sulfate/Pamabrom, Aluminum Hydroxide/Aspirin/Magnesium Hydroxide, Aspirin, Aspirin/Caffeine/Propoxyphene Hydrochloride, Aspirin/Carisoprodol, Aspirin/Carisoprodol/Codeine Phosphate, Aspirin/Citric Acid/Sodium Bicarbonate, Aspirin/Codeine Phosphate, Aspirin/Diphenhydramine Citrate, Aspirin/Diphenhydramine Hydrochloride, Aspirin/Dipyridamole, Aspirin/Ethoheptazine Citrate/Meprobamate, Aspirin/Hydrocodone Bitartrate, Aspirin/Magnesium Oxide, Aspirin/Meprobamate, Aspirin/Methocarbamol, Aspirin/Oxycodone Hydrochloride, Aspirin/Oxycodone Hydrochloride, Aspirin/Pentazocine Hydrochloride, Aspirin/Pheniramine/Phenylpropanolamine/Pyrilamine, Aspirin/Phenylpropanolamine, Aspirin/Phenylpropanolamine Bitartrate, Aspirin/Phenylpropanolamine Hydrochloride, Aspirin/Phenyltoloxamine Citrate, Aspirin/Propoxyphene Hydrochloride, Aspirin/Propoxyphene Napsylate | Generic drug name |
| P2Y12 Inhibitors | Clopidogrel Hydrogen Sulfate, Prasugrel Hydrochloride, Ticagrelor, Ticlopidine Hydrochloride | Generic drug name |
| NSAIDs | Acetaminophen; Ibuprofen; Simethicone; Zinc Oxide, Diclofenac Epolamine, Diclofenac Potassium, Diclofenac Sodium, Diflunisal, Diphenhydramine Citrate/Ibuprofen, Diphenhydramine Hydrochloride/Ibuprofen, Diphenhydramine Hydrochloride/Magnesium Salicylate, Esomeprazole Magnesium/Naproxen, Etodolac, Famotidine/Ibuprofen, Fenoprofen Calcium, Flurbiprofen, Hydrocodone Bitartrate/Ibuprofen, Ibuprofen, Ibuprofen Lysine, Ibuprofen/Oxycodone Hydrochloride, Ibuprofen/Pseudoephedrine Hydrochloride, Indomethacin, Ketoprofen, Lansoprazole; Naproxen, Magnesium Salicylate, Meclofenamate Sodium, Mefenamic Acid, Meloxicam, Nabumetone, Naproxen, Naproxen Sodium, Naproxen Sodium/Pseudoephedrine Hydrochloride, Naproxen Sodium/Sumatriptan Succinate, Oxaprozin, Piroxicam, Salsalate, Sunlindac, Tolmetin Sodium | Generic drug name |
| COX-2-specific NSAIDs | Celecoxib | Generic drug name |
| Class                  | Examples                                                                                                                                  | Generic drug name |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| ACE inhibitors or ARBs| Amlodipine Besylate/Benazepril Hydrochloride, Amlodipine Besylate/HCTZ/Olmesartan Medoxomil, Amlodipine Besylate/Hydrochlorothiazide/Valsartan, Amlodipine Besylate/Olmesartan Medoxomil, Amlodipine Besylate/Telmisartan, Amlodipine Besylate/Valsartan, Azilsartan Medoxomil, Azilsartan Medoxomil/Chlorthalidone, Benazepril Hydrochloride, Benazepril Hydrochloride/Hydrochlorothiazide, Candesartan Cilexetil, Candesartan Cilexetil/Hydrochlorothiazide, Captopril, Captopril/Hydrochlorothiazide, Enalapril Maleate, Enalapril Maleate/Hydrochlorothiazide, Eprosartan Mesylate, Eprosartan Mesylate/Hydrochlorothiazide, Fosinopril Sodium, Fosinopril Sodium/Hydrochlorothiazide, Hydrochlorothiazide/Irbesartan, Hydrochlorothiazide/Lisinopril, Hydrochlorothiazide/Losartan Potassium, Hydrochlorothiazide/Moexipril Hydrochloride, Hydrochlorothiazide/Olmesartan Medoxomil, Hydrochlorothiazide/Quinapril Hydrochloride, Hydrochlorothiazide/Telmisartan, Hydrochlorothiazide/Valsartan, Irbesartan, Lisinopril, Losartan Potassium, Moexipril Hydrochloride, Olmesartan Medoxomil, Perindopril Erbumine, Quinapril Hydrochloride, Ramipril, Telmisartan, Trandolapril, Trandolapril/Verapamil Hydrochloride, Valsartan |                  |
| β-blockers            | Acebutolol Hydrochloride, Atenolol, Atenolol/Chlorthalidone, Bendroflumethiazide/Nadolol, Betaxolol Hydrochloride, Bisoprolol Fumarate, Bisoprolol Fumarate/Hydrochlorothiazide, Carvedilol, Hydrochlorothiazide/Metoprolol Succinate, Hydrochlorothiazide/Metoprolol Tartrate, Hydrochlorothiazide/Propranolol Hydrochloride, Labetalol Hydrochloride, Metoprolol Succinate, Metoprolol Tartrate, Nadolol, Nebivolol Hydrochloride, Penbutolol Sulfate, Pindolol, Propranolol Hydrochloride, Sotalol Hydrochloride, Timolol |                  |
| Diltiazem             | Diltiazem Hydrochloride                                                                                                                   |                  |
| Verapamil             | Trandolapril/Verapamil Hydrochloride, Verapamil Hydrochloride                                                                             |                  |
| Dihydropyridine calcium channel blockers | Aliskiren/Amlodipine Besylate, Aliskiren/Amlodipine Besylate/Hydrochlorothiazide, Amlodipine Besylate, Amlodipine Besylate/Atorvastatin Calcium, Amlodipine Besylate/Benazepril Hydrochloride, Amlodipine Besylate/HCTZ/Olmesartan Medoxomil, Amlodipine Besylate/Hydrochlorothiazide/Valsartan, Amlodipine Besylate/Olmesartan Medoxomil, Amlodipine Besylate/Telmisartan, Amlodipine Besylate/Valsartan, Felodipine, Isradipine, Nifedipine, Nisoldipine |                  |
| Loop diuretic         | Bumetanide, Ethacrynic Acid, Furosemide, Torsemide                                                                                       |                  |
|                | Thiazide diuretic                                                                 | Generic drug name                               |
|----------------|-----------------------------------------------------------------------------------|-------------------------------------------------|
|                | Aliskiren/Amlodipine Besylate/Hydrochlorothiazide, Amlodipine                       |                                                 |
|                | Aliskiren/Hydrochlorothiazide, Amiloride                                           |                                                 |
|                | Hydrochloride/Hydrochlorothiazide, Amlodipine Besylate/Valasartan, Atenolol/Clorthalidone, Azilsartan Medoxomil/Clorthalidone, Benazepril |                                                 |
|                | Hydrochloride/Hydrochlorothiazide, Bisoprolol Fumarate/Clorthalidiazide, Candesartan |                                                 |
|                | Cilexetil/Hydrochlorothiazide, Captopril/Hydrochlorothiazide, Captopril/Hydrochlorothiazide, Chlorthalidone, Chlorthalidone/Clonidine |                                                 |
|                | Deserpidine/Hydrochlorothiazide, Enalapril Maleate/Hydrochlorothiazide, Eprosartan |                                                 |
|                | Mesylate/Hydrochlorothiazide, Fosinopril Sodium/Hydrochlorothiazide, Guanethidine Monosulfate/Hydrochlorothiazide, Hydralazine |                                                 |
|                | Hydrochloride/Hydrochlorothiazide, Hydrochlorothiazide, Hydrochlorothiazide/Lisinopril, Hydrochlorothiazide/Losartan Potassium, Hydrochlorothiazide/Methyldopa, Hydrochlorothiazide/Metoprolol Succinate, Hydrochlorothiazide/Metoprolol Tartrate, Hydrochlorothiazide/Moexipril Hydrochloride, Hydrochlorothiazide/Propranolol Hydrochloride, Hydrochlorothiazide/Quinapril Hydrochloride, Hydrochlorothiazide/Reserpine, Hydrochlorothiazide/Spiroonolactone, Hydrochlorothiazide/Telmisartan, Hydrochlorothiazide/Triamterene, Hydrochlorothiazide/Valsartan, Indapamide, Methyclothiazide, Metolazone |                                                 |
| Digoxin        | Digoxin                                                                           |                                                 |
| Amiodarone     | Amiodarone Hydrochloride                                                          |                                                 |
| Dronedarone    | Dronedarone Hydrochloride                                                          |                                                 |
| Other antiarrhythmic drugs | Disopyramide Phosphate, Dofetilide, Flecaainide Acetate, Mexiletine, Procainamide Hydrochloride, Propafenone Hydrochloride, Quinidine Gluconate, Sotalol Hydrochloride |                                                 |
| Statins        | Amlodipine Besylate/Atorvastatin Calcium, Atorvastatin Calcium, Atorvastatin Calcium/Ezetimibe, Ezetimibe/Simvastatin, Fluvastatin Sodium, Lovastatin, Lovastatin/Niacin, Niacin/Simvastatin, Pitavastatin Calcium, Pravastatin Sodium, Rosuvastatin Calcium, Simvastatin, Simvastatin/Sitagliptin Phosphate |                                                 |
| Category                                    | Drugs                                                                                           | Drug Name                        |
|---------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------|
| Other cholesterol lowering drugs            | Cholestyramine, Colesevelam, Colestipol Hydrochloride, Ezetimibe, Fenofibrate, Gemfibrozil, Lomitapide Mesylate, Niacin, Omega-3 Acid Ethyl Esters | Generic drug name                |
| Metformin                                   | Alogliptin Benzoate/Metformin Hydrochloride, Glipizide/Metformin Hydrochloride, Glyburide/Metformin Hydrochloride, Linagliptin/Metformin Hydrochloride, Metformin Hydrochloride, Metformin Hydrochloride/Pioglitazone Hydrochloride, Metformin Hydrochloride/Repaglinide, Metformin Hydrochloride/Rosiglitazone Maleate, Metformin Hydrochloride/Saxagliptin Hydrochloride, Metformin Hydrochloride/Sitagliptin Phosphate | Generic drug name                |
| Sulfonylureas or glinides                   | Chlorpropamide, Gliclazide, Glimepiride, Glimepiride/Rosiglitazone Maleate, Glipizide, Glipizide/Metformin Hydrochloride, Glyburide, Glyburide/Metformin Hydrochloride, Metformin Hydrochloride/Repaglinide, Nateglinide, Repaglinide, Tolbutamide | Generic drug name                |
| Thiazolidinediones                          | Alogliptin Benzoate/Pioglitazone Hydrochloride, Glimepiride/Pioglitazone Hydrochloride, Glimepiride/Rosiglitazone Maleate, Metformin Hydrochloride/Pioglitazone Hydrochloride, Metformin Hydrochloride/Rosiglitazone Maleate, Pioglitazone Hydrochloride, Rosiglitazone Maleate | Generic drug name                |
| Dipeptidyl peptidase-4 inhibitors           | Alogliptin Benzoate, Linagliptin, Saxagliptin Hydrochloride, Simvastatin/Sitagliptin Phosphate, Sitagliptin Phosphate | Generic drug name                |
| Glucagon-like peptide-1 agonists            | Exenatide, Liraglutide, Lixisenatide, Albiglutide, Dulaglutide, Semaglutide                      | Generic drug name                |
| Insulin                                     | Insulin Aspart, Recombinant, Insulin Aspart/Insulin Aspart Protamine, Insulin Beef Isophane (NPH), Insulin Beef, Regular/Insulin Pork Isophane (NPH), Insulin Beef Regular/Insulin Pork Regular, Insulin Beef Regular/Insulin Pork Zinc (Lente), Insulin Beef Zinc (Lente), Insulin Zinc, Extended (Ultralente), Insulin Zinc, Prompt (Semilente), Insulin Bovine, Insulin Detemir, Insulin Glargine, Recombinant, Insulin Glulisine, Insulin Human Inhaled, Insulin Human Isophane (NPH), Insulin Human Isophane (NPH)/Insulin Human Regular, Insulin Human Regular, Insulin Human Regular, Buffered, Insulin Human Zinc (Lente), Insulin Human Zinc, Extended (Ultralente), Insulin Lispro, Recombinant, Insulin Lispro/Insulin Lispro Protamine, Insulin Pork Isophane (NPH), Insulin Pork Regular, Insulin Pork Zinc (Lente) | Generic drug name                |
| Benzodiazepines                             | Alprazolam, Amitriptyline Hydrochloride/Chlordiazepoxide, Chlordiazepoxide, Chlordiazepoxide Hydrochloride, Chlordiazepoxide | Generic drug name                |
| Category                        | Examples                                                                 | Generic drug name |
|--------------------------------|--------------------------------------------------------------------------|-------------------|
| Hydrochloride/Clidinium Bromide, Clonazepam, Clorazepate Dipotassium, Diazepam, Lorazepam, Oxazepam |                                                                       |
| SSRIs or SNRIs                 | Citalopram Hydrobromide, Desvenlafaxine, Desvenlafaxine Succinate, Duloxetine, Escitalopram Oxalate, Fluoxetine Hydrochloride, Fluoxetine Hydrochloride/Olanzapine, Fluvoxamine Maleate, Levomilnacipran Hydrochloride, Milnacipran Hydrochloride, Paroxetine Hydrochloride, Sertraline Hydrochloride, Venlafaxine Hydrochloride, Vilazodone Hydrochloride, Vortioxetine Hydrobromide | Yes               |
| Other antidepressants          | Amitriptyline Hydrochloride, Amitriptyline Hydrochloride/Chlordiazepoxide, Amitriptyline Hydrochloride/Perphenazine, Amoxapine, buPROPion hydrobromide, Bupropion Hydrochloride, Clomipramine Hydrochloride, Desipramine Hydrochloride, Doxepin Hydrochloride, Imipramine Hydrochloride, Mirtazapine, Nefazodone Hydrochloride, Nortriptyline Hydrochloride, Protriptyline Hydrochloride, Trazodone Hydrochloride, Trimipramine Maleate, Vilazodone Hydrochloride | Yes               |
| Proton pump inhibitors         | Dexlansoprazole, Esomeprazole Magnesium, Lansoprazole, Omeprazole, Omeprazole Magnesium, Omeprazole Sodium, Omeprazole/Sodium Bicarbonate, Pantoprazole Sodium, Rabeprazole Sodium | Yes               |
| Histamine-2 receptor antagonists | Calcium Carbonate/Famotidine/Magnesium Hydroxide, Cimetidine, Famotidine, Nizatidine, Ranitidine Bismuth Citrate, Ranitidine Hydrochloride | Yes               |
| Systemic corticosteroids       | Cortisone Acetate, Dexamethasone, Fludrocortisone Acetate, Hydrocortisone, Methylprednisolone, Prednisolone, Prednisone | Yes               |
eFigure 1. Flow Diagram of Patient Inclusion and Exclusion

Adult NVAF Patients Newly-Initiated on Rivaroxaban or Warfarin, With 12 Months Continuous Medical and Prescription Insurance Coverage and Without Other Indications for Anticoagulation

N=78,517

Excluded Due to Presence of Stage 5 CKD or Dialysis at Baseline

N=5,918

Eligible for Analysis

N=72,599

Rivaroxaban Cohort

N=36,318

Warfarin Cohort

N=36,281
eFigure 2. Kaplan–Meier Curve for Development of Acute Kidney Injury

Development of AKI (%) vs. Time (Days)
eFigure 3. Kaplan–Meier Curve for Development of Stage 5 Chronic Kidney Disease or Need for Dialysis