CPCSSN Case Definitions

2022-Q4

Created: 2019-05-01

Last updated: 2023-02-06

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Purpose

This document is intended to be the simplest unambiguous representation of CPCSSN’s current case definitions, consistent with the original documented intent. It defines the criteria, in terms of CPCSSN data, that CPCSSN’s case detection algorithms use to classify a patient as having a given condition.

This document is intended for use by:
- researchers needing to understand or use CPCSSN’s case definitions,
- those wanting to propose modifications or create new case definitions,
- CPCSSN’s developers to implement CPCSSN’s case definitions

This document is not intended to include suggested changes or improvements to the case definitions. Proposed changes to existing case definitions or new case definitions should be submitted to CPCSSN’s Case Definition Working Group, where they will be reviewed, possibly approved, and prioritised for implementation by CPCSSN’s development team.
List of CPCSSN Case Definitions

In the ‘Method of Creation’ column, the following two terms are used:

1. **Expert panel.** The case definition was created by subject-matter experts, typically clinicians. They may or may not have based the definitions on CPCSSN data.
2. **Machine learning.** The case definition was created by applying a machine learning algorithm to the CPCSSN data.

All validation metrics (sensitivity, specificity, positive predictive value, and negative predictive value) for all validated case definitions are listed in Appendix A. Legacy case definitions are listed in Appendix B.

<table>
<thead>
<tr>
<th>Case Definition</th>
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<th>Quarter Last Updated</th>
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</table>
Interpretation

The following pages contain the logic used to classify each CPCSSN patient’s disease status for a host of disease case definitions. For each disease Case Definition, any single **Scenario** is sufficient to warrant classification as a case. Within a **Scenario**, all criteria joined by “AND” must be satisfied to warrant classification as a case. Conditions followed by “EXCEPT” define exceptions to the disease case definitions. That is, these conditions negate other criteria within the **Scenario**, so any other criteria in the **Scenario** alone are insufficient to define a disease case.

The text ‘including [all] sub-codes’ indicates a wildcard match is to be applied to the listed codes. The **date of case detection** for a case is defined to be the earliest of the individual (qualifying) criteria dates for the case.

The following pages contain the most current versions of CPCSSN case definitions and are the ones applied to the most recent data set. Old case definition versions are listed in **Appendix B**.
# CPCSSN Case Definitions

## Adult Asthma

**Note:** Patient age must be ≥18 years.

### Scenario A

<table>
<thead>
<tr>
<th>Any of the following ICD-9 codes (including all sub-codes) in the Billing, EncounterDiagnosis, or Health Condition table:</th>
<th>EXCEPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>493: ASTHMA</td>
<td>If the Billing table contains at least one of the following ICD-9 codes (including all sub-codes), the asthma diagnosis is not sufficient to define a case:</td>
</tr>
<tr>
<td></td>
<td>491: CHRONIC BRONCHITIS</td>
</tr>
<tr>
<td></td>
<td>492: EMPHYSEMA</td>
</tr>
<tr>
<td></td>
<td>493: CHRONIC AIRWAY OBSTRUCTION, NOT ELSEWHERE CLASSIFIED</td>
</tr>
</tbody>
</table>
Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the Billing, EncounterDiagnosis, or Health Condition table:

410: ACUTE MYOCARDIAL INFARCTION
411: OTHER ACUTE AND SUBACUTE FORMS OF ISCHEMIC HEART DISEASE
412: OLD MYOCARDIAL INFARCTION
413: ANGINA PECTORIS
414: OTHER FORMS OF CHRONIC ISCHEMIC HEART DISEASE
430: SUBARACHNOID HEMORRHAGE
431: INTRACEREBRAL HEMORRHAGE
432: OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE
433: OCCLUSION AND STENOSIS OF PRECEREBRAL ARTERIES
434: OCCLUSION OF CEREBRAL ARTERIES
435: TRANSIENT CEREBRAL ISCHEMIA
436: ACUTE, BUT ILL-DEFINED, CEREBROVASCULAR DISEASE
437: OTHER AND ILL-DEFINED CEREBROVASCULAR DISEASE
438: LATE EFFECTS OF CEREBROVASCULAR DISEASE
440: ATHEROSCLEROSIS
443: OTHER PERIPHERAL VASCULAR DISEASE
Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

- 430: SUBARACHNOID HEMORRHAGE
- 431: INTRACEREBRAL HEMORRHAGE
- 432: OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE
- 433: OCCLUSION AND STENOSIS OF PRECEREBRAL ARTERIES
- 434: OCCLUSION OF CEREBRAL ARTERIES
- 435: TRANSIENT CEREBRAL ISCHEMIA
- 436: ACUTE, BUT ILL-DEFINED, CEREBROVASCULAR DISEASE
- 437: OTHER AND ILL-DEFINED CEREBROVASCULAR DISEASE
- 438: LATE EFFECTS OF CEREBROVASCULAR DISEASE
**Scenario A**

Any of the following ICD-9 codes (including all sub-codes) in the Billing, EncounterDiagnosis, or Health Condition table:

425: CARDIOMYOPATHY  
428: HEART FAILURE

---

**Scenario B**

One or occurrences of an ATC code (including all sub-codes) in from all three of the following groups in the Medication table:

**Group 1: Diuretics**

- C03BA11: INDAPAMIDE  
- C03CA01: FUROSEMIDE  
- C03DA01: SPIRONOLACTONE  
- C03DA04: EPLERENONE

AND

**Group 2: Beta-Blockers**

- C07AB: BETA BLOCKING AGENTS, SELECTIVE  
- C07AG: ALPHA AND BETA BLOCKING AGENTS

AND

**Group 3: ACE inhibitors, ARB and Combinations with Beta Blockers or Renin-Angiotensin blockers**

- C09: AGENTS ACTING ON THE RENIN-ANGIOTENSIN SYSTEM
Cirrhosis

Scenario A

Any of the following exact ICD-9 codes in the Billing, EncounterDiagnosis, or Health Condition table:

571: CHRONIC LIVER DISEASE AND CIRRHOSIS
571.2: ALCOHOLIC CIRRHOSIS OF LIVER
571.5: CIRRHOSIS OF LIVER WITHOUT MENTION OF ALCOHOL
789.59: OTHER ASCITES
Scenario A

Two Plasma Creatinine Clearance (eGFR) tests (LOINC = 12195-4) in the Lab table having results < 60 ml/min/1.73 m² separated by between 3 months and 18 months, inclusive.
COPD (Congestive Obstructive Pulmonary Disorder)

Note: For all scenarios, patient age at onset must be $\geq 35$ years.

**Scenario A**

Any of the following ICD-9 codes (including all sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

- 491.2: OBSTRUCTIVE CHRONIC BRONCHITIS
- 492: EMPHYSEMA
- 496: CHRONIC AIRWAY OBSTRUCTION, NOT ELSEWHERE CLASSIFIED

**Scenario B**

Any of the following ATC codes (including all sub-codes) in the Medication table:

- R03BB: ANTICHOLINERGICS
- R03AK04: SALBUTAMOL AND SODIUM CROMOGLICATE
- R03AL: ADRENERGICS IN COMBINATION WITH ANTICHOLINERGICS INCLUDING TRIPLE COMBINATIONS WITH CORTICOSTEROIDS

<table>
<thead>
<tr>
<th>EXCEPT</th>
<th>If the HealthCondition table contains the following ICD-9 code (including all sub-codes), the medications are insufficient for defining a disease case:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>493: ASTHMA</td>
</tr>
</tbody>
</table>
Coronary Artery Disease

Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the Billing, EncounterDiagnosis, or Health Condition table:

410: ACUTE MYOCARDIAL INFARCTION
411: OTHER ACUTE AND SUBACUTE FORMS OF ISCHEMIC HEART DISEASE
412: OLD MYOCARDIAL INFARCTION
413: ANGINA PECTORIS
414: OTHER FORMS OF CHRONIC ISCHEMIC HEART DISEASE
Dementia

Scenario A

Any of the following ICD-9 codes (including sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

290: DEMENTIAS
294.1: DEMENTIA IN CONDITIONS CLASSIFIED ELSEWHERE
294.8: OTHER PERSISTENT MENTAL DISORDERS DUE TO CONDITIONS CLASSIFIED ELSEWHERE
331: OTHER CEREBRAL DEGENERATIONS

excluding sub-codes:

290.8: OTHER SPECIFIED SENILE PSYCHOTIC CONDITIONS
290.9: UNSPECIFIED SENILE PSYCHOTIC CONDITION
331.3: COMMUNICATING HYDROCEPHALUS
331.4: OBSTRUCTIVE HYDROCEPHALUS
331.5: IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS (INPH)
331.81: REYE’S SYNDROME

Scenario B

Any of the following ATC codes (including all sub-codes) in the Medication table:

N06DA: ANTICHOLINESTERASES
N06DX01: MEMANTINE
Depression

Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the Billing, EncounterDiagnosis, or Health Condition table:

296: EPISODIC MOOD DISORDERS
311: DEPRESSIVE DISORDER, NOT ELSEWHERE CLASSIFIED

Scenario B

Any of the following ATC codes (including all sub-codes) in the Medication table:

N06AB: SELECTIVE SEROTONIN REUPTAKE INHIBITORS
N06AF04: TRANYLCYPROMINE
N06AG02: MOCLOBEMIDE
N06AX11: MIRTAZAPINE
N06CA01: AMITRIPTYLINE AND PSYCHOLEPTICS

EXCEPT

If the HealthCondition table contains the following ICD-9 code (including all sub-codes), the medications are insufficient for defining a disease case:

300: ANXIETY DISORDER
Diabetic Neuropathy

Note: For all scenarios, patients must have Diabetes Mellitus as defined by the CPCSSN case finding algorithm.

**Scenario A**

One or more occurrences of the following exact ICD-9 code in the Billing, EncounterDiagnosis, or Health Condition table:

357.2: POLYNEUROPATHY IN DIABETES

OR

two or more occurrences of the following ICD-9 code (including all sub-codes) across any of the Billing, EncounterDiagnosis, or Health Condition tables:

250.6: DIABETES WITH NEUROLOGICAL MANIFESTATIONS

**Scenario B**

One or more occurrences of any of the following terms in the DiagnosisText_orig in the Billing, EncounterDiagnosis, or Health Condition table:

‘neuropathy’

OR

‘neuropathie’

Uncertain and negated terms (e.g., ‘neuropathy?’, ‘no neuropathy’) are ignored.
Diabetic Retinopathy

Note: For all scenarios, patients must have Diabetes Mellitus as defined by the CPCSSN case finding algorithm.

**Scenario A**

One or more occurrences of the following exact ICD-9 code in the Billing, EncounterDiagnosis, or Health Condition table:

362.0: DIABETIC RETINOPATHY

**Scenario B**

One or more occurrences of any of the following terms in the DiagnosisText_orig field of the Billing, EncounterDiagnosis, or Health Condition table:

‘retinopathy’
OR
‘retinopathie’
OR
‘rétinopathie’

Uncertain and negated terms (e.g., ‘retinopathy?’, ‘no retinopathy’) are ignored.
Diabetes Mellitus

**Scenario A**

The following ICD-9 code (including all sub-codes) in the EncounterDiagnosis or Health Condition table

OR

at least two (identical or different) of the following ICD-9 code (including all sub-codes) in the Billing table that are recorded on different dates that are ≤ 2 years apart:

250: DIABETES MELLITUS

**Scenario B**

The following ATC code (including all sub-codes) in the Medication table:

A10: DRUGS USED IN DIABETES

EXCEPT

If the HealthCondition table contains any of the following ICD-9 codes (including all sub-codes), the medications are insufficient for defining a disease case:

249: SECONDARY DIABETES MELLITUS
256.4: POLYCYSTIC OVARIIES
648.8: ABNORMAL GLUCOSE TOLERANCE OF MOTHER, COMPLICATING PREGNANCY, CHILDBIRTH, OR THE Puerperium
775.1: NEONATAL DIABETES MELLITUS
790.29: OTHER ABNORMAL GLUCOSE

**Scenario C**

Any Hemoglobin A1c (HbA1c) test (LOINC = 17856-6) in the Lab table with a result ≥ 6.5

OR

at least two Fasting Blood Glucose (FBG) tests (LOINC = 14771-0) in the Lab table having results strictly > 7 that are recorded on different dates that are ≤ 1 year apart.
**Dyslipidemia**

**Scenario A**

The following ICD-9 code (including sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

272: DISORDERS OF LIPOID METABOLISM

**Scenario B**

Any of the following ATC codes (including all sub-codes) in the Medication table:

- C10: LIPID MODIFYING AGENTS

excluding any of the following ATC codes (including all sub-codes) in the Medication table:

- C10AC: BILE ACID SEQUESTRANTS

EXCEPT

If the DiseaseCase table contains the following disease, the medications are insufficient for defining a disease case:

- Diabetes Mellitus, Version 3

**Scenario 3**

Any **Cholesterol in LDL (LDLc)** test (LOINC = 22748-8) in the Lab table with a result ≥ 3.5 mmol/L

**OR**

Any **Cholesterol Total/Cholesterol in HDL Ratio (TCh/HDL)** test (LOINC = 9830-1) in the Lab table with a result ≥ 4.3 mmol/L
Epilepsy

Scenario A

The following ICD-9 code (including sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

345: EPILEPSY AND RECURRENT SEIZURES

excluding sub-codes:

345.2: PETIT MAL STATUS, EPILEPTIC
345.3: GRAND MAL STATUS, EPILEPTIC

Scenario B

Any of the following ICD-9 codes (including all sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

345.2: PETIT MAL STATUS, EPILEPTIC
345.3: GRAND MAL STATUS, EPILEPTIC
780.3: CONVULSIONS

AND

Any of the following ATC codes (including sub-codes) in the Medication table:

N03A: ANTIEPILEPTICS
N05BA06: LORAZEPAM
N05BA09: CLOBAZAM

excluding sub-codes:

N03AE01: CLONAZEPAM
N03AX12: GABAPENTIN
Herpes Zoster

Scenario A

The following ICD-9 code (including all sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

053: HERPES ZOSTER
Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the EncounterDiagnosis or Health Condition table

OR

at least two (identical or different) of the following ICD-9 codes (including all sub-codes) in the Billing table that are recorded on different dates that are ≤2 years apart:

401: ESSENTIAL HYPERTENSION
402: HYPERTENSIVE HEART DISEASE
403: HYPERTENSIVE CHRONIC KIDNEY DISEASE
404: HYPERTENSIVE HEART AND CHRONIC KIDNEY DISEASE
405: SECONDARY HYPERTENSION
## Scenario B

Any of the following ATC codes (including all sub-codes) in the **Medication** table:

- C02: ANTIHYPERTENSIVES
- C03AA03: HYDROCHLOROTHIAZIDE
- C03BA04: CHLORTALIDONE
- C03BA11: INDAPAMIDE
- C03DB01: AMILORIDE
- C03DB02: TRIAMTERENE
- C03EA01: HYDROCHLOROTHIAZIDE AND POTASSIUM-SPARING AGENTS
- C07AA06: TIMOLOL
- C07AB03: ATENOLOL
- C07AB04: ACEBUTOLOL
- C07AG02: CARVEDILOL
- C07CB03: ATENOLOL AND OTHER DIURETICS
- C08CA01: AMLODIPINE
- C08CA02: FELODIPINE
- C08DA01: VERAPAMIL
- C09AA01: CAPTOPRIL
- C09AA02: ENALAPRIL
- C09AA03: LISINOPRIL
- C09AA07: BENAZEPRIL
- C09AA08: CILAZAPRIL
- C09AA09: FOSINOPRIL
- C09AA10: TRANDOLAPRIL
- C09BA02: ENALAPRIL AND DIURETICS
- C09BA03: LISINOPRIL AND DIURETICS
- C09CA02: EPROSARTAN
- C09CA03: VALSARTAN
- C09CA04: IRBESARTAN
- C09CA07: TELMISARTAN
- C09DA01: LOSARTAN AND DIURETICS
- C09DA02: EPROSARTAN AND DIURETICS
- C09DA04: IRBESARTAN AND DIURETICS
- C09XA02: ALISKIREN

If the **HealthCondition** table contains any of the following ICD-9 codes (including all sub-codes), the medications are insufficient for defining a disease case:

- 250: DIABETES MELLITUS
- 333.1: ESSENTIAL AND OTHER SPECIFIED FORMS OF TREMOR
- 346: MIGRAINE
- 410: ACUTE MYOCARDIAL INFARCTION
- 412: OLD MYOCARDIAL INFARCTION
- 413: ANGINA PECTORIS
- 427: CARDIAC DYSRHYTHMIAS
- 428: HEART FAILURE
- 456.0: ESOPHAGEAL VARICES WITH BLEEDING
- 456.1: ESOPHAGEAL VARICES WITHOUT MENTION OF BLEEDING
- 572.3: PORTAL HYPERTENSION
- 592: CALCULUS OF KIDNEY AND URETER

**EXCEPT**
Multiple Sclerosis

Note: For all three scenarios, patient age must be ≥18 years.

**Scenario A**

At least two (identical or different) of the following ICD-9 code (including all sub-codes) in the Billing or Encounter Diagnosis table that are recorded on different dates that are ≤2 years apart:

340: MULTIPLE SCLEROSIS

OR

one or more occurrences of the following ICD-9 code (including all sub-codes) in the Health Condition table:

340: MULTIPLE SCLEROSIS

**Scenario B**

One or more (identical or different) of the following ATC codes in the Medication table:

L03AB07: INTERFERON BETA-1A
L03AB08: INTERFERON BETA-1B
L03AB13: PEGINTERFERON BETA-1A
L03AX13: GLATIRAMER ACETATE
L04AA23: NATALIZUMAB
L04AA27: FINGOLIMOD
L04AA31: TERIFLUNOMIDE
L04AC01: DACLIZUMAB
N07XX09: DIMETHYL FUMARATE
**Scenario C**

<table>
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<th>One or more of the following ATC code in the Medication table:</th>
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<td>L04AA34: ALEMTUZUMAB</td>
<td>If the Billing, EncounterDiagnosis, or HealthCondition table contains any of the following ICD-9 codes (including all sub-codes), the medications are insufficient for defining a disease case:</td>
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<tr>
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<td>204: LYMPHOID LEUKEMIA</td>
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<td></td>
<td>205: MYELOID LEUKEMIA</td>
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<td></td>
<td>206: MONOCYTIC LEUKEMIA</td>
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<td></td>
<td>207: OTHER SPECIFIED LEUKEMIA</td>
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<tr>
<td></td>
<td>208: LEUKEMIA OF UNSPECIFIED CELL TYPE</td>
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<td></td>
<td>209: NEUROENDOCRINE TUMORS</td>
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</table>
## Non-Valvular Atrial Fibrillation (NVAF)

### Scenario A

<table>
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<tr>
<th>If any of the Billing, EncounterDiagnosis, or HealthCondition tables contains any of the following exact ICD-9 codes, the ICD-9 codes in the first column are insufficient for defining a disease case:</th>
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<td>394: DISEASES OF MITRAL VALVE</td>
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<tr>
<td>394.0: MITRAL STENOSIS</td>
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<tr>
<td>394.1: RHEUMATIC MITRAL INSUFFICIENCY</td>
</tr>
<tr>
<td>394.2: MITRAL STENOSIS WITH INSUFFICIENCY</td>
</tr>
<tr>
<td>394.9: OTHER AND UNSPECIFIED MITRAL VALVE DISEASES</td>
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<tr>
<td>395: DISEASES OF AORTIC VALVE</td>
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<tr>
<td>395.0: RHEUMATIC AORTIC STENOSIS</td>
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<tr>
<td>395.1: RHEUMATIC AORTIC INSUFFICIENCY</td>
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<td>395.2: RHEUMATIC AORTIC STENOSIS WITH INSUFFICIENCY</td>
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<tr>
<td>395.9: OTHER AND UNSPECIFIED RHEUMATIC AORTIC DISEASES</td>
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<tr>
<td>396: DISEASES OF MITRAL AND AORTIC VALVES</td>
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<td>396.0: MITRAL VALVE STENOSIS AND AORTIC VALVE STENOSIS</td>
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<td>396.1: MITRAL VALVE STENOSIS AND AORTIC VALVE INSUFFICIENCY</td>
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<td>396.2: MITRAL VALVE INSUFFICIENCY AND AORTIC VALVE STENOSIS</td>
</tr>
<tr>
<td>396.3: MITRAL VALVE INSUFFICIENCY AND AORTIC VALVE INSUFFICIENCY</td>
</tr>
<tr>
<td>396.8: MULTIPLE INVOLVEMENT OF MITRAL AND AORTIC VALVES</td>
</tr>
<tr>
<td>396.9: MITRAL AND AORTIC VALVE DISEASES, UNSPECIFIED</td>
</tr>
<tr>
<td>424: OTHER DISEASES OF ENDOCARDIUM</td>
</tr>
<tr>
<td>424.0: MITRAL VALVE DISORDERS</td>
</tr>
<tr>
<td>424.1: AORTIC VALVE DISORDERS</td>
</tr>
<tr>
<td>424.2: TRICUSPID VALVE DISORDERS, SPECIFIED AS NONRHEUMATIC</td>
</tr>
<tr>
<td>424.3: PULMONARY VALVE DISORDERS</td>
</tr>
<tr>
<td>424.9: ENDOCARDITIS, VALVE UNSPECIFIED</td>
</tr>
<tr>
<td>424.90: ENDOCARDITIS, VALVE UNSPECIFIED, UNSPECIFIED CAUSE</td>
</tr>
<tr>
<td>424.91: ENDOCARDITIS IN DISEASES CLASSIFIED ELSEWHERE</td>
</tr>
<tr>
<td>424.99: OTHER ENDOCARDITIS, VALVE UNSPECIFIED</td>
</tr>
<tr>
<td>V43.3: HEART VALVE REPLACED BY OTHER MEANS</td>
</tr>
</tbody>
</table>

Any of the following exact ICD-9 codes in the Billing, EncounterDiagnosis, or HealthCondition table:

- 427.3: ATRIAL FIBRILLATION AND FLUTTER
- 427.31: ATRIAL FIBRILLATION
- 427.32: ATRIAL FLUTTER

EXCEPT

- 394: DISEASES OF MITRAL VALVE
- 394.0: MITRAL STENOSIS
- 394.1: RHEUMATIC MITRAL INSUFFICIENCY
- 394.2: MITRAL STENOSIS WITH INSUFFICIENCY
- 394.9: OTHER AND UNSPECIFIED MITRAL VALVE DISEASES
- 395: DISEASES OF AORTIC VALVE
- 395.0: RHEUMATIC AORTIC STENOSIS
- 395.1: RHEUMATIC AORTIC INSUFFICIENCY
- 395.2: RHEUMATIC AORTIC STENOSIS WITH INSUFFICIENCY
- 395.9: OTHER AND UNSPECIFIED RHEUMATIC AORTIC DISEASES
- 396: DISEASES OF MITRAL AND AORTIC VALVES
- 396.0: MITRAL VALVE STENOSIS AND AORTIC VALVE STENOSIS
- 396.1: MITRAL VALVE STENOSIS AND AORTIC VALVE INSUFFICIENCY
- 396.2: MITRAL VALVE INSUFFICIENCY AND AORTIC VALVE STENOSIS
- 396.3: MITRAL VALVE INSUFFICIENCY AND AORTIC VALVE INSUFFICIENCY
- 396.8: MULTIPLE INVOLVEMENT OF MITRAL AND AORTIC VALVES
- 396.9: MITRAL AND AORTIC VALVE DISEASES, UNSPECIFIED
- 424: OTHER DISEASES OF ENDOCARDIUM
- 424.0: MITRAL VALVE DISORDERS
- 424.1: AORTIC VALVE DISORDERS
- 424.2: TRICUSPID VALVE DISORDERS, SPECIFIED AS NONRHEUMATIC
- 424.3: PULMONARY VALVE DISORDERS
- 424.9: ENDOCARDITIS, VALVE UNSPECIFIED
- 424.90: ENDOCARDITIS, VALVE UNSPECIFIED, UNSPECIFIED CAUSE
- 424.91: ENDOCARDITIS IN DISEASES CLASSIFIED ELSEWHERE
- 424.99: OTHER ENDOCARDITIS, VALVE UNSPECIFIED
- V43.3: HEART VALVE REPLACED BY OTHER MEANS
Osteoarthritis

**Scenario A**

Any of the following ICD-9 codes (including all sub-codes) in the Billing, EncounterDiagnosis, or Health Condition table:

- 715: OSTEOARTHRROSIS AND ALLIED DISORDERS
- 721: SPONDYLOSIS AND ALLIED DISORDERS
Parkinson’s Disease

Scenario A

The following ICD-9 code (including all sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

332: PARKINSON'S DISEASE
Pediatric Asthma

Note: For all scenarios, patient age must be between 1 and 17 years, inclusive.

**Scenario A**

The following ICD-9 code (including all sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

493: ASTHMA

**Scenario B**

At least two (identical or different) of the following ATC codes in the Medication table:

- H02AB02: DEXAMETHASONE
- H02AB06: PREDNISOLONE
- H02AB07: PREDNISONE
- R03AC02: SALBUTAMOL
- R03AC03: TERBUTALINE
- R03AC04: FENOTEROL
- R03AC12: SALMETEROL
- R03AC13: FORMOTEROL
- R03AC18: INDACATEROL
- R03AK06: SALMETEROL AND FLUTICASONE
- R03AK07: FORMOTEROL AND BUDESONIDE
- R03AK08: FORMOTEROL AND BECLOMETASONE
- R03AK09: FORMOTEROL AND MOMETASONE
- R03BA01: BECLOMETASONE
- R03BA02: BUDESONIDE
- R03BA05: FLUTICASONE
- R03BA06: TRIAMCINOLONE
- R03BA07: MOMETASONE
- R03BA08: CICLESONIDE
- R03BB01: IPRATROPIUM BROMIDE
- R03DC01: ZAFIRLUKAST
- R03DC03: MONTELUKAST
Pediatric Diabetes Mellitus

Note: For all scenarios, patient age at onset must be < 18 years.

**Scenario A**

The following ICD-9 code (including all sub-codes) in the Health Condition table OR at least two (identical or different) of the following ICD-9 code (including all sub-codes) in the Billing table that are recorded on different dates that are ≤ 2 years apart:

- 250: DIABETES MELLITUS

**Scenario B**

The following ATC code (including all sub-codes) in the Medication table:

- A10: DRUGS USED IN DIABETES

**Scenario C**

Two or more Hemoglobin A1c (HbA1c) test (LOINC = 17856-6) in the Lab table with a result ≥ 6.5
PTSD (Post-Traumatic Stress Disorder)

**Scenario A**

The following ICD-9 code (including all sub-codes) in the Billing, Encounter Diagnosis, or Health Condition table:

309.81: POSTTRAUMATIC STRESS DISORDER
### Scenario B

Any of the following ICD-9 codes in the Billing, EncounterDiagnosis, or HealthCondition table:

- 290: DEMENTIAS
- 291: ALCOHOL-INDUCED MENTAL DISORDERS
- 292: DRUG-INDUCED MENTAL DISORDERS
- 293: TRANSIENT MENTAL DISORDERS DUE TO CONDITIONS CLASSIFIED ELSEWHERE
- 294: PERSISTENT MENTAL DISORDERS DUE TO CONDITIONS CLASSIFIED ELSEWHERE
- 295: SCHIZOPHRENIC DISORDERS
- 296: EPISODIC MOOD DISORDERS
- 297: DELUSIONAL DISORDERS
- 298: OTHER NONORGANIC PSYCHOSES
- 299: PERVASIVE DEVELOPMENTAL DISORDERS
- 300: ANXIETY, DISSOCIATIVE AND SOMATOFORM DISORDERS
- 301: PERSONALITY DISORDERS
- 302: SEXUAL AND GENDER IDENTITY DISORDERS
- 303: ALCOHOL DEPENDENCE SYNDROME
- 304: DRUG DEPENDENCE
- 305: NONDEPENDENT ABUSE OF DRUGS
- 306: PHYSIOLOGICAL MALFUNCTION ARISING FROM MENTAL FACTORS
- 307: SPECIAL SYMPTOMS OR SYNDROMES, NOT ELSEWHERE CLASSIFIED
- 308: ACUTE REACTION TO STRESS
- 309: ADJUSTMENT REACTION
- 310: SPECIFIC NONPSYCHOTIC MENTAL DISORDERS DUE TO BRAIN DAMAGE
- 311: DEPRESSIVE DISORDER NEC
- 312: DISTURBANCE OF CONDUCT, NOT ELSEWHERE CLASSIFIED
- 313: DISTURBANCE OF EMOTIONS SPECIFIC TO CHILDHOOD AND ADOLESCENCE
- 314: HYPERKINETIC SYNDROME OF CHILDHOOD
- 315: SPECIFIC DELAYS IN DEVELOPMENT
- 316: PSYCHIC FACTOR W OTH DIS

AND

the `DiagnosisText_orig` for the same record matches the following case-insensitive and regex patterns (the dot `.` indicates matches to any one character):

- ‘ptsd’
  OR
- ‘post-traumatic stress’
  OR
- ‘stress post-traumatique’
# Appendix A - Validation Results and References

<table>
<thead>
<tr>
<th>Case Definition</th>
<th>Version</th>
<th>Method of Creation</th>
<th>Sensitivity % (95% CI)</th>
<th>Specificity % (95% CI)</th>
<th>PPV % (95% CI)</th>
<th>NPV % (95% CI)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Asthma†</td>
<td>1</td>
<td>Expert panel</td>
<td>80.6 (69.5-88.9)</td>
<td>96.4 (94.7-97.7)</td>
<td>70.7 (59.7-80.3)</td>
<td>97.9 (96.5-98.8)</td>
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<tr>
<td>Cardiovascular Disease④</td>
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<td>Expert panel</td>
<td>76.9 (70.4-82.5)</td>
<td>97.2 (96.3-97.9)</td>
<td>75.4 (69.8-80.2)</td>
<td>97.4 (96.7-98.0)</td>
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<td>Cerebrovascular Disease④</td>
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<td>Expert panel</td>
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<td>98.6 (97.9-99.0)</td>
<td>65.0 (55.7-73.3)</td>
<td>99.2 (98.8-99.5)</td>
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<tr>
<td>Chronic Heart Failure④‡</td>
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<td>98.8 (98.2-99.2)</td>
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<td>99.8 (99.5-99.9)</td>
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<td>Cirrhosis†</td>
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<td>84.6 (83.1-86.0)</td>
<td>99.3 (99.1-99.4)</td>
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<td>-</td>
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<td>COPD*</td>
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<td>Expert panel</td>
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<tr>
<td>Coronary Artery Disease④</td>
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<td>Expert panel</td>
<td>91.6 (84.6-96.1)</td>
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<td>74.8 (67.8-80.7)</td>
<td>99.5 (99.1-99.7)</td>
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</tr>
<tr>
<td>Dementia†</td>
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<td>Expert panel</td>
<td>96.8 (93.3-100.0)</td>
<td>98.1 (97.5-98.7)</td>
<td>72.8 (65.0-80.6)</td>
<td>99.8 (99.6-100.0)</td>
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</tr>
<tr>
<td>Depression⑧</td>
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<td>Expert panel</td>
<td>81.1 (77.2-85.0)</td>
<td>94.8 (93.7-95.9)</td>
<td>79.6 (75.7-83.6)</td>
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<tr>
<td>Diabetic Neuropathy^</td>
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<td>Machine learning</td>
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<td>97.3 (96.5-98.0)</td>
<td>70.5 (62.1-77.7)</td>
<td>98.4 (97.7-98.8)</td>
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<tr>
<td>Diabetic Retinopathy^</td>
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<td>Machine learning</td>
<td>92.1 (86.0-95.8)</td>
<td>98.4 (97.8-98.9)</td>
<td>80.2 (72.4-86.1)</td>
<td>99.5 (99.0-99.7)</td>
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<tr>
<td>Diabetes Mellitus*④</td>
<td>4</td>
<td>Expert panel</td>
<td>95.6 (93.4-97.9)</td>
<td>97.1 (96.3-97.9)</td>
<td>87.0 (83.5-90.5)</td>
<td>87.0</td>
<td>18</td>
</tr>
<tr>
<td>Dyslipidemia†</td>
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<td>Expert panel</td>
<td>94.8 (87.2-98.6)</td>
<td>100 (93.3-100.0)</td>
<td>100 (99.9-100.0)</td>
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<td>19</td>
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<tr>
<td>Epilepsy†</td>
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<td>Expert panel</td>
<td>98.6 (96.6-100.0)</td>
<td>98.7 (98.2-99.2)</td>
<td>85.6 (80.2-91.1)</td>
<td>99.9 (99.7-100.0)</td>
<td>20</td>
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<tr>
<td>Herpes Zoster②,3</td>
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<td>Expert panel</td>
<td>100.0 (97.8-100.0)</td>
<td>73.7 (65.0-81.3)</td>
<td>83.9 (79.5-87.5)</td>
<td>100 (-)</td>
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<tr>
<td>Hypertension****</td>
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<td>Expert panel</td>
<td>84.9 (82.6-87.1)</td>
<td>93.5 (92.0-95.1)</td>
<td>92.9 (91.2-94.6)</td>
<td>86.0 (83.9-88.2)</td>
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<tr>
<td>Multiple Sclerosis⑦</td>
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<td>Expert panel</td>
<td>93.3 (89.2-96.2)</td>
<td>99.6 (99.2-99.9)</td>
<td>97.7 (94.6-99.0)</td>
<td>98.9 (98.1-99.2)</td>
<td>24</td>
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<tr>
<td>Non-valvular Atrial Fibrillation (NVAF)④‡</td>
<td>1</td>
<td>Expert panel</td>
<td>78.1 (66.0-87.5)</td>
<td>99.5 (99.1-99.7)</td>
<td>80.7 (70.0-88.1)</td>
<td>99.4 (99.0-99.6)</td>
<td>26</td>
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<tr>
<td>Osteoarthritis⑧</td>
<td>3</td>
<td>Expert panel</td>
<td>77.8 (74.5-81.1)</td>
<td>94.9 (93.8-96.1)</td>
<td>87.7 (84.9-90.5)</td>
<td>90.2</td>
<td>27</td>
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<td>Parkinson's Disease†</td>
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<td>Expert panel</td>
<td>98.8 (96.4-100.0)</td>
<td>99.0 (98.6-99.5)</td>
<td>82.0 (74.5-89.5)</td>
<td>99.9 (99.8-100.0)</td>
<td>28</td>
</tr>
</tbody>
</table>
### Table

<table>
<thead>
<tr>
<th>Disease</th>
<th>Expert panel</th>
<th>Validity Statistics</th>
<th>Prevalence Statistics</th>
<th>Validation Validation</th>
<th>Notes</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pediatric Asthma</strong></td>
<td>1</td>
<td>Expert panel</td>
<td>(96.9 ±0.5)</td>
<td>Not reported</td>
<td>100.0 (±0.0)</td>
<td>Reference 1</td>
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<tr>
<td><strong>Pediatric Diabetes Mellitus</strong></td>
<td>1</td>
<td>Expert panel</td>
<td>(94.9 ±0.5)</td>
<td>100.0 (±0.0)</td>
<td>100.0 (±0.0)</td>
<td>Reference 1</td>
</tr>
<tr>
<td><strong>PTSD</strong></td>
<td>1</td>
<td>Expert panel</td>
<td>(95.3 ±0.5)</td>
<td>98.4 (±0.5)</td>
<td>95.2 (±0.5)</td>
<td>Reference 1</td>
</tr>
</tbody>
</table>

* Definition is based solely on laboratory results, thus reference standard validation cannot be completed.

** Updated HbA1C cut-off from greater than equal to 7.0 to greater than equal to 6.5, as per clinical guidelines, and the EncounterDiagnosis table has been included for case detection by ICD-9 code. No revalidation completed.

*** Updated version of Hypertension Version 1 by removal of a rarely used drug (Metolazone) and inclusion of the EncounterDiagnosis table for case detection by ICD-9 code. Validation metrics are expected to be similar to Hypertension Version 1.

† Unpublished results.

‡ Quoted metrics are from an unpublished validation on a sample of the CPCSSN National Data Set.

* Publication in progress (as of 2023-02-06).

# Validation metrics are for the original case definitions, published in reference 1. The updated case definitions shown in this document now include the EncounterDiagnosis table for identification of cases by ICD-9. The validation metrics are not expected to be much altered by this change.

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Appendix B - Legacy Case Definitions

The following pages contain all previously implemented CPCSSN case definitions, and include the date ranges for which they were in use.

COPD (Version 1): 2012-Q2 to 2022-Q2

Note: For all scenarios, patient age at onset must be ≥ 35 years.

Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the Billing or Health Condition table:

491.2: OBSTRUCTIVE CHRONIC BRONCHITIS
492: EMPHYSEMA
496: CHRONIC AIRWAY OBSTRUCTION, NOT ELSEWHERE CLASSIFIED

Scenario B

Any of the following ATC codes (including all sub-codes) in the Medication table:

R03BB: ANTICHOLINERGICS
R03AK04: SALBUTAMOL AND SODIUM CROMOGlicate
R03AL: ADRENERGICS IN COMBINATION WITH ANTICHOLINERGICS INCLUDING TRIPLE COMBINATIONS WITH CORTICOSTEROIDS

If the HealthCondition table contains the following ICD-9 code (including all sub-codes), the medications are insufficient for defining a disease case:

EXCEPT

493: ASTHMA
**Depression (Version 1): 2018-Q2 to 2022-Q2**

### Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the **Billing**, **EncounterDiagnosis**, or **Health Condition** table:

- 296: EPISODIC MOOD DISORDERS
- 311: DEPRESSIVE DISORDER, NOT ELSEWHERE CLASSIFIED

### Scenario B

Any of the following ATC codes (including all sub-codes) in the **Medication** table:

- N06AB: SELECTIVE SEROTONIN REUPTAKE INHIBITORS
- N06AF04: TRANYLCYPROMINE
- N06AG02: MOCLOBEMIDE
- N06AX11: MIRTAZAPINE
- N06CA01: AMITRIPTYLINE AND PSYCHOLEPTICS

EXCEPT

If the **HealthCondition** table contains the following ICD-9 code (including all sub-codes), the medications are insufficient for defining a disease case:

- 300: ANXIETY DISORDER
Diabetes Mellitus (Version 1): 2012-Q2 to 2022-Q2

Scenario A

The following ICD-9 code (including all sub-codes) in the Health Condition table  
OR  
at least two (identical or different) of the following ICD-9 code (including all sub-codes) in the Billing table that are recorded on different dates that are ≤ 2 years apart:

250: DIABETES MELLITUS

Scenario B

The following ATC code (including all sub-codes) in the Medication table:

A10: DRUGS USED IN DIABETES  
EXCEPT  
If the HealthCondition table contains any of the following ICD-9 codes (including all sub-codes), the medications are insufficient for defining a disease case:

249: SECONDARY DIABETES MELLITUS  
256.4: POLYCYSTIC OVARIES  
648.8: ABNORMAL GLUCOSE TOLERANCE OF MOTHER, COMPLICATING PREGNANCY, CHILDBIRTH, OR THE Puerperium  
775.1: NEONATAL DIABETES MELLITUS  
790.29: OTHER ABNORMAL GLUCOSE

Scenario C

Any Hemoglobin A1c (HbA1c) test (LOINC = 17856-6) in the Lab table with a result ≥ 7  
OR  
at least two Fasting Blood Glucose (FBG) tests (LOINC = 14771-0) in the Lab table having results strictly > 7 that are recorded on different dates that are ≤ 1 year apart.
Scenario A

The following ICD-9 code (including all sub-codes) in the Health Condition table

OR

at least two (identical or different) of the following ICD-9 code
(including all sub-codes) in the Encounter Diagnosis table that
are recorded on different dates that are ≤2 years apart:

250: DIABETES MELLITUS
Scenario A

The following ICD-9 code (including all sub-codes) in the Health Condition table

OR

at least two (identical or different) of the following ICD-9 code (including all sub-codes) in the Billing table that are recorded on different dates that are ≤2 years apart:

250: DIABETES MELLITUS

Scenario B

The following ATC code (including all sub-codes) in the Medication table:

A10: DRUGS USED IN DIABETES

EXCEPT

If the HealthCondition table contains any of the following ICD-9 codes (including all sub-codes), the medications are insufficient for defining a disease case:

249: SECONDARY DIABETES MELLITUS
256.4: POLYCYSTIC OVARIES
648.8: ABNORMAL GLUCOSE TOLERANCE OF MOTHER, COMPLICATING PREGNANCY, CHILDBIRTH, OR THE PUEPERIUM
775.1: NEONATAL DIABETES MELLITUS
790.29: OTHER ABNORMAL GLUCOSE

Scenario C

Any Hemoglobin A1c (HbA1c) test (LOINC = 17856-6) in the Lab table with a result ≥ 6.5

OR

at least two Fasting Blood Glucose (FBG) tests (LOINC = 14771-0) in the Lab table having results strictly > 7 that are recorded on different dates that are ≤1 year apart.
Hypertension (Version 1): 2012-Q2 to 2022-Q2

Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the Health Condition table

OR

at least two (identical or different) of the following ICD-9 codes (including all sub-codes) in the Billing table that are recorded on different dates that are ≤2 years apart:

- 401: ESSENTIAL HYPERTENSION
- 402: HYPERTENSIVE HEART DISEASE
- 403: HYPERTENSIVE CHRONIC KIDNEY DISEASE
- 404: HYPERTENSIVE HEART AND CHRONIC KIDNEY DISEASE
- 405: SECONDARY HYPERTENSION
### Scenario B

Any of the following ATC codes (including all sub-codes) in the **Medication** table:

- C02: ANTIHYPERTENSIVES
- C03AA03: HYDROCHLOROTHIAZIDE
- C03BA04: CHLORTALIDONE
- C03BA08: METOLAZONE
- C03BA11: INDAPAMIDE
- C03DB01: AMILORIDE
- C03DB02: TRIAMTERENE
- C03EA01: HYDROCHLOROTHIAZIDE AND POTASSIUM-SPARING AGENTS
- C07AA06: TIMOLOL
- C07AB03: ATENOLOL
- C07AB04: ACEBUTOLOL
- C07AG02: CARVEDILOL
- C07CB03: ATENOLOL AND OTHER DIURETICS
- C08CA01: AMLODIPINE
- C08CA02: FELODIPINE
- C08DA01: VERAPAMIL
- C09AA01: CAPTOPRIL
- C09AA02: ENALAPRIL
- C09AA03: LISRINOPRIL
- C09AA07: BENAZEPRI
- C09AA08: CILAZAPRIL
- C09AA09: FOSINOPRIL
- C09AA10: TRANDOLAPRIL
- C09BA02: ENALAPRIL AND DIURETICS
- C09BA03: LISRINOPRIL AND DIURETICS
- C09CA02: EPROSARTAN
- C09CA03: VALSARTAN
- C09CA04: IRBESARTAN
- C09CA07: TELMISARTAN
- C09DA01: LOSARTAN AND DIURETICS
- C09DA02: EPROSARTAN AND DIURETICS
- C09DA04: IRBESARTAN AND DIURETICS
- C09XA02: ALISKIREN

EXCEPT

If the **HealthCondition** table contains any of the following ICD-9 codes (including all sub-codes), the medications are insufficient for defining a disease case:

- 250: DIABETES MELLITUS
- 333.1: ESSENTIAL AND OTHER SPECIFIED FORMS OF TREMOR
- 346: MIGRAINE
- 410: ACUTE MYOCARDIAL INFARCTION
- 412: OLD MYOCARDIAL INFARCTION
- 413: ANGINA PECTORIS
- 427: CARDIAC DYSRHYTHMIAS
- 428: HEART FAILURE
- 456.0: ESOPHAGEAL VARICES WITH BLEEDING
- 456.1: ESOPHAGEAL VARICES WITHOUT MENTION OF BLEEDING
- 572.3: PORTAL HYPERTENSION
- 592: CALCULUS OF KIDNEY AND URETER


Scenario A

The following ICD-9 code (including all sub-codes) in the Encounter Diagnosis or Health Condition table:

401: ESSENTIAL HYPERTENSION

Scenario B

The following ATC code in the Medication table:

C08CA01: AMLODIPINE
Hypertension (Version 3): 2021-Q4 to 2022-Q2

**Scenario A**

Any of the following ICD-9 codes (including all sub-codes) in the Health Condition table

OR

at least two (identical or different) of the following ICD-9 codes (including all sub-codes) in the Billing table that are recorded on different dates that are ≤2 years apart:

- 401: ESSENTIAL HYPERTENSION
- 402: HYPERTENSIVE HEART DISEASE
- 403: HYPERTENSIVE CHRONIC KIDNEY DISEASE
- 404: HYPERTENSIVE HEART AND CHRONIC KIDNEY DISEASE
- 405: SECONDARY HYPERTENSION
Scenario A

Any of the following ICD-9 codes (including all sub-codes) in the Billing or Health Condition table:

715: OSTEOARTHROSIS AND ALLIED DISORDERS
721: SPONDYLOSIS AND ALLIED DISORDERS
Osteoarthritis (Version 2): 2018-Q4 to 2022-Q2

Scenario A

The following ICD-9 code (including all sub-codes) in the Encounter Diagnosis or Health Condition table:

715: OSTEOARTHROSIS AND ALLIED DISORDERS