

Prediction of Findings from the Ongoing COBRRA-AF Trial Using Healthcare Database Analyses

DUPLICATE – COBRRA AF

March 7<sup>th</sup>, 2022

## 1. RCT Details

This section provides a high-level overview of an **ongoing** RCT that the described real-world evidence study is trying to replicate as closely as possible given the limitations inherent in the healthcare databases.

### 1.1 Title

**Comparison of Bleeding Risk Between Rivaroxaban and Apixaban in Patients with Atrial Fibrillation (COBRRRA - AF)**

### 1.2 Intended aim(s)

To compare the incidence of major and clinically relevant non-major bleeding events in patients with non-valvular atrial fibrillation diagnosed by an ECG.

### 1.3 Primary endpoint for replication

Time from randomization to the first confirmed, adjudicated occurrence of a major bleeding or clinically relevant non-major bleeding event up to 365 days after initiating anticoagulation treatment.

### 1.4 Required power for primary endpoint and noninferiority margin (if applicable)

The hazard ratio for the clinical trial is unknown because the trial is ongoing. Based upon Proietti et al., a systematic review of observational studies of apixaban safety in atrial fibrillation patients, we calculated power based on an array of potential effect sizes.<sup>1,2</sup>

### 1.5 Secondary endpoint for replication (assay sensitivity) and RCT finding

Secondary cardiovascular objectives:

- To assess the frequency of major bleeding events and non-major clinically relevant bleeding events as separate outcomes
- Stroke
- All-cause mortality

### 1.6 Trial estimate

The trial is ongoing and scheduled to complete in December of 2025.

Effectiveness research with Real World Data to support FDA's regulatory decision making

## **2. Person responsible for implementation of replication in Aetion**

Luke Zobotka, BA and Mufaddal Mahesri, MD, MPH, implemented the study design in the Aetion Evidence Platform. They are not responsible for the validity of the design and analytic choices. All implementation steps are recorded, and the implementation history is archived in the platform.

## **3. Data Source(s)**

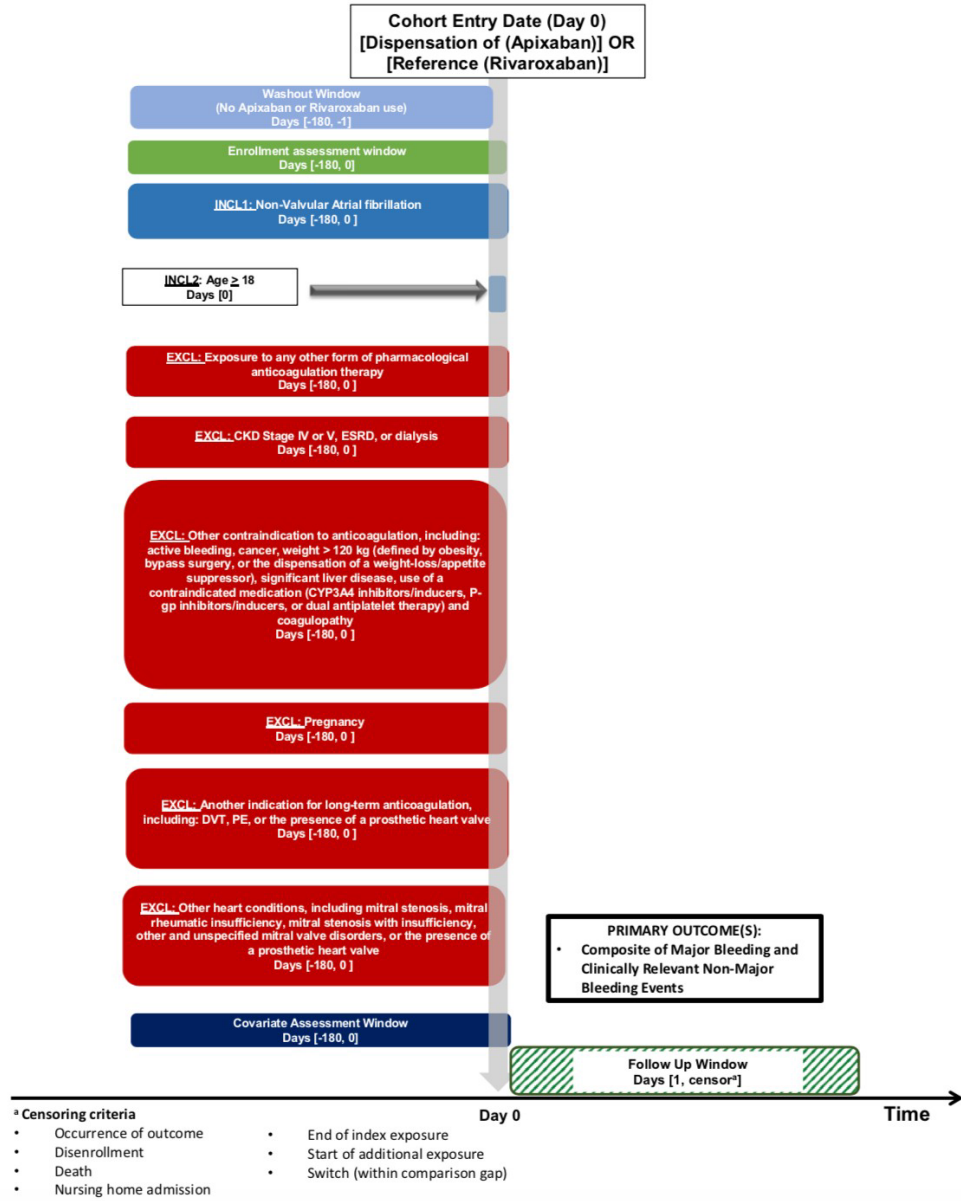
Optum CDM, IBM® MarketScan®, CMS NOAC

## **4. Study Design Diagram**

The study design diagram visualizes key aspects of the longitudinal study design for expedited review.

Figure 1.

### Design Diagram – COBRRA - AF TRIAL REPLICATION



## 5. Cohort Identification

### 5.1 Cohort Summary

An active-comparator, new-user design, propensity score matched, cohort study will be applied to compare patients that received apixaban vs. rivaroxaban. Patients will enter the cohort upon initiation of apixaban or rivaroxaban after a 180 day washout without anticoagulant exposure. They will be required to have a diagnosis code indicating non-valvular atrial fibrillation in the prior 180 days, and be age 18 or older on the date of initiation of therapy. Subjects will be excluded if they have had any indication of stage IV or V CKD, ESRD, an active bleeding episode, cancer, obesity, liver disease, or another indication for long-term anticoagulation, such as hospitalization for DVT or PE, in the prior 180 days. Patients will also be excluded if they have used any contraindicated medications in the prior 180 days or had an indication for atrial fibrillation that was not non-valvular. All patients were required to have continuous enrollment for 180 days prior to cohort entry to ensure incident use of the study drugs.

### 5.2 Important steps for cohort formation

New use of the exposure (apixaban or rivaroxaban) is defined as no use of either drug in the 180 days prior to cohort entry. The first eligible cohort entry date will be selected after applying all inclusion-exclusion criteria.

#### 5.2.1 Eligible cohort entry dates

The apixaban indication for prevention of stroke or systemic embolism in patients with atrial fibrillation was approved by the FDA on December 28<sup>th</sup>, 2012. Rivaroxaban was initially approved for the same indication on November 4<sup>th</sup>, 2011.

- IBM® MarketScan®: Dec 28, 2012 – December 31, 2019 (end of available data)
- Optum CDM: Dec 28, 2012 – June 30, 2020 (end of available data)
- CMS NOAC: Dec 28, 2012 – Dec 31, 2017 (end of available data)

#### 5.2.2 Specify inclusion/exclusion criteria for cohort entry and define the index date

Inclusion and exclusion criteria were adapted from the trial as closely as possible. Definitions for all inclusion/exclusion are provided in **Appendix** and are summarized in the flowcharts below.

### 5.3 Flowchart of the study cohort assembly

For Apixaban vs. Rivaroxaban

	Optum CDM		IBM® MarketScan®		CMS - NOAC	
	Less Excluded Patients	Remaining Patients	Less Excluded Patients	Remaining Patients	Less Excluded Patients	Remaining Patients
<b>All patients in our database</b>		<b>81,796,156</b>		<b>205,537,714</b>		<b>6,886,908</b>
<b>Patients with Apixaban/Rivaroxaban</b> [measured between Dec 28, 2012 and June 30, 2020.]		856,974		685,749		2,232,416
<b>Excluded due to insufficient enrollment</b> [-180, 0]	-118,628 (14%)	738,346	-54,038 (8%)	631,711	-373,136 (17%)	1,859,280
<b>After wash-out for prior use of reference (Rivaroxaban)</b> [-180, -1]	-206,560 (28%)	531,786	-211,703 (34%)	420,008	-601,148 (32%)	1,258,132
<b>After wash-out for prior use of exposure (Apixaban)</b> [-180, -1]	-278,943 (52%)	252,843	-170,997 (41%)	249,011	-549,695 (44%)	708,437
<b>Excluded because patient qualified in &gt;1 exposure category</b>	-13 (<1%)	252,830	-24 (<1%)	248,987	-54 (<1%)	708,383
<b>Exclusion of Missing Age</b> [-180, 0]	-7 (<1%)	252,823	-0 (<1%)	248,987	-151 (<1%)	708,232
<b>Exclusion of Gender (Exclude Missing Values)</b> [start of all available data, 0]	-17 (<1%)	252,806	-0 (<1%)	248,987	--	--
<b>Inclusion of Age &gt;= 18</b> [0,0]	-170 (<1%)	252,636	-415 (<1%)	248,572	--	--
<b>Inclusion of Non-Valvular A-fib</b> [-180,0]	-104,252 (41%)	148,384	-132,025 (53%)	116,547	-264,650 (37%)	443,581
<b>Exclusion of Anticoagulant Use</b> [-180, 0]	-7,414 (5%)	140,970	-6,140 (5%)	110,407	-34,042 (8%)	409,539
<b>Exclusion of CKD Stage 4/5 or ESRD</b> [-180,0]	-2,876 (2%)	138,094	-994 (<1%)	109,413	-7,617 (2%)	401,922
<b>Exclusion of Dialysis or Renal Transplant)</b> [-180, 0]	-158 (<1%)	137,936	-119 (<1%)	109,294	-421 (<1%)	401,501

<b>Exclusion of Bleeding History [-180, 0]</b>	-2,721 (2%)	135,215	-3,332 (3%)	105,962	-23,500 (6%)	378,001
<b>Exclusion of Cancer [-180,0]</b>	-5,556 (4%)	129,659	-3,177 (3%)	102,785	-14,538 (4%)	363,463
<b>Exclusion of Weight &gt; 120 kg [-180, 0]</b>	-6,963 (5%)	122,696	-3,322 (3%)	99,463	-10,521 (3%)	352,942
<b>Exclusion of Significant Liver Disease [-180, 0]</b>	-1,781 (1%)	120,915	-892 (<1%)	98,571	-3,233 (<1%)	349,709
<b>Exclusion of Use of Contraindicated Medications [-180, 0]</b>	-693 (<1%)	120,222	-596 (<1%)	97,975	-2,762 (<1%)	346,947
<b>Exclusion of Dual Antiplatelet Therapy [-180,0]</b>	-3,219 (3%)	117,003	-2,642 (3%)	95,333	-9,829 (3%)	337,118
<b>Exclusion of Other Heart Conditions [-180,0]</b>	-3,603 (3%)	113,400	-3,056 (3%)	92,277	-7,962 (2%)	329,156
<b>Exclusion of Other Indication of Long-Term Anticoagulation [-180, 0]</b>	-489 (<1%)	112,911	-293 (<1%)	91,984	-1,447 (<1%)	327,709
<b>Exclusion of Pregnancy [-180,0]</b>	-3 (<1%)	112,908	-4 (<1%)	91,980	--	--
<b>Exclusion of Coagulopathy [-180,0]</b>	-958 (<1%)	111,950	-320 (<1%)	91,660	--	--
<b>Final cohort</b>		<b>111,950</b>		<b>91,660</b>		<b>325,926</b>

\*CMS cell suppression policies may result in omitted data

## 6. Variables

### 6.1 Exposure-related variables:

#### Study drug:

The study exposure of interest is defined by a prescription drug claim indicating apixaban dispensation. New initiation will be defined by no such records of apixaban in the prior 180 days before treatment initiation (washout period) and fulfillment of study eligibility criteria.

#### Comparator agent:

The comparator is defined by a prescription drug claim indicating rivaroxaban dispensation. New initiation will be defined by no such records of rivaroxaban in the prior 180 days before treatment initiation (washout period) and fulfillment of study eligibility criteria.

## 6.2 Preliminary Covariates:

- Age
- Gender
- CCI score

The covariate listed above represents only a small subset of the covariate vector that will ultimately be controlled for in the design and analysis. We use the covariates above only for initial feasibility analyses to judge whether there is likely to be sufficient overlap between treatment groups to proceed with the study. Remaining covariates are defined only after the study has passed the initial feasibility analysis and the initial power assessment and are listed in Table 1 (**Appendix B**).

## 6.3 Outcome variables and study follow-up:

### 6.3.1 Outcome variables

Safety outcome variables of interest (definitions provided in **Appendix**):

- **Primary outcome:** Major bleeding and clinically relevant non-major bleeding through 365 days of treatment with apixaban or rivaroxaban.
- Secondary outcomes:
  - To assess the frequency of major bleeding events and clinically relevant non-major bleeding individually
  - To assess the frequency of intracranial and extracranial bleeding events
  - Stroke
  - All-cause mortality

### 6.3.2 Study follow-up



Effectiveness research with Real World Data to support FDA's regulatory decision making

Both as-treated (AT) and intention-to-treat (ITT) analyses will be conducted with treatment defined as the index drug on day of cohort entry. The **as-treated** will be the primary analysis. An allowable gap of 10 days between records indicating each treatment will qualify as "continuous therapy" with respect to follow-up in the as-treated analysis.

The follow-up will start the day after drug initiation (i.e., cohort entry date), and will continue until the earliest date of the following events:

- The first occurrence of the outcome of interest
- The date of end of continuous registration in the database
- End of the study period at 365 days
- Measured death event occurs
- Switch
- Discontinuation (10-day allowable grace period and risk window)
- Nursing home admission
- Initiation of another anticoagulant (dabigatran, heparin, warfarin, etc.)

In the secondary ITT analysis, we will not censor for discontinuation, switching among study drugs, or addition of other anticoagulants

## 7. Initial Feasibility Analysis

Aetion report name:

For apixaban vs. rivaroxaban

Optum CDM - <https://bwh-dope.aetion.com/projects/details/1813/rwrs/78411>

IBM® MarketScan® - <https://bwh-dope.aetion.com/projects/details/1814/rwrs/78632>

CMS NOAC - <https://bwh-dope.aetion.com/projects/details/1814/rwrs/78632>

Date conducted: 01/28/2022

Complete Aetion feasibility analysis using age, gender, and CCI as the only covariates and the primary endpoint (Section 6.3.1) as the outcome. No measures of association will be computed, nor will incidence rates be stratified by treatment group.

- Report patient characteristics by treatment group

■ Apixaban vs Rivaroxaban

	Optum CDM			IBM® MarketScan®			CMS - NOAC		
Variable	Rivaroxaban - Comparator	Apixaban - Exposure	Difference	Rivaroxaban - Comparator	Apixaban - Exposure	Difference	Rivaroxaban - Comparator	Apixaban - Exposure	Difference
Number of patients	39,628	72,322		41,932	49,503		148,933	176,546	
<b>Age</b>									
...mean (sd)	71.62 (10.97)	74.33 (10.15)	-2.71 (-2.84, -2.58)	66.38 (12.81)	68.13 (13.18)	-1.75 (-1.92, -1.58)	76.19 (8.31)	77.68 (8.32)	-1.49 (-1.55, -1.44)
...median [IQR]	73.00 [66.00, 80.00]	75.00 [68.00, 82.00]		65.00 [58.00, 76.00]	67.00 [59.00, 79.00]		76.00 [70.00, 82.00]	77.00 [72.00, 84.00]	
<b>Gender</b>									
M	22,048 (55.6%)	35,362 (48.9%)	6.7% (6.1%, 7.4%)	25,981 (62.0%)	28,450 (57.5%)	4.5% (3.8%, 5.1%)	69,102 (46.4%)	74,655 (42.3%)	4.1% (3.8%, 4.5%)
F	17,580 (44.4%)	36,960 (51.1%)	-6.7% (-7.4%, -6.1%)	15,951 (38.0%)	21,053 (42.5%)	-4.5% (-5.1%, -3.8%)	79,831 (53.6%)	101,891 (57.7%)	-4.1% (-4.5%, -3.8%)
U									
<b>CCI (180 Days)</b>									
... mean (sd)	2.18 (2.11)	2.63 (2.37)	-0.45 (-0.48, -0.42)	1.53 (1.58)	1.80 (1.80)	-0.27 (-0.29, -0.24)	1.83 (1.81)	2.04 (1.95)	-0.21 (-0.22, -0.20)
...median [IQR]	2.00 [1.00, 3.00]	2.00 [1.00, 4.00]		1.00 [0.00, 2.00]	1.00 [0.00, 3.00]		1.00 [0.00, 3.00]	2.00 [1.00, 3.00]	

- Report summary parameters of study population **FEASIBILITY- FOR STUDY OUTCOME**
  - For Apixaban vs Rivaroxaban

<b>FEASIBILITY FOR STUDY OUTCOME</b>			
	<b>Optum CDM</b>	<b>IBM® MarketScan®</b>	<b>CMS - NOAC</b>
Number of patients in full cohort	111,950	91,660	325,926
Number of patients dropped as incomplete cases	0	0	0
Number of patients that did not begin follow-up	115	225	447
Number of patients in analytic cohort	111,835	91,435	325,489
Number of events	2,226	2,570	17,135
Number of person-years	44,062.25	35,513.75	126,012.26
Number of patients in group: Rivaroxaban - Comparator	39,574	41,932	148,933
Number of patients in group: Apixaban - Exposure	72,261	49,503	176,546
Risk per 1,000 patients	19.9	28.11	52.65
Rate per 1,000 person-years	50.52	72.37	135.98

- Report median follow-up time by treatment group
  - For Apixaban vs Rivaroxaban

<b>FOLLOW-UP TIME FOR STUDY OUTCOME</b>			
<b>Median Follow-Up Time (Days) [IQR] – At 10 days gap</b>			
<b>Patient Group</b>	<b>Optum CDM</b>	<b>IBM® MarketScan®</b>	<b>CMS - NOAC</b>
Overall Patient Population	98 [38, 235]	98 [38, 222]	98 [38, 222]
Referent - Rivaroxaban	98 [38, 222]	98 [38, 219]	98 [38, 219]
Exposure - Apixaban	98 [38, 243]	98 [38, 225]	98 [38, 226]

- Report reasons for censoring in the overall study population

■ For Apixaban vs Rivaroxaban

<b>CENSORING REASONS FOR STUDY OUTCOME</b>			
<b>Reasons</b>	<b>Optum CDM</b>	<b>IBM® MarketScan®</b>	<b>CMS - NOAC</b>
Outcome	2,226 (2.0%)	2,570 (2.8%)	17,135 (5.3%)
Death	852 (0.8%)	38 (0.0%)	3,744 (1.2%)
Start of an additional exposure	1,423 (1.3%)	1,250 (1.4%)	5,584 (1.7%)
End of index exposure	71,747 (64.2%)	55,668 (60.9%)	189,840 (58.3%)
Maximum follow-up time reached	16,894 (15.1%)	12,797 (14.0%)	42,722 (13.1%)
End of patient data	18 (0.0%)	5,277 (5.8%)	38,454 (11.8%)
End of patient enrollment	5,827 (5.2%)	11,391 (12.5%)	4,681 (1.4%)
Other Anticoagulant Use + Nursing Home Admission	12,848 (11.5%)	2,444 (2.7%)	23,319 (7.2%)

- Report overall risk of the primary outcome.

	<b>Optum CDM</b>	<b>IBM® MarketScan®</b>	<b>CMS - NOAC</b>	<b>Pooled</b>
Risk per 1,000 patients	20.2089659	27.7425893	53.4783969	41.4990646

**8. Initial Power Assessment**

Action report name:

■ For Apixaban vs Rivaroxaban

- Optum CDM - <https://bwh-dope.aetion.com/projects/details/1813/rwrs/78412>
- IBM® MarketScan®- <https://bwh-dope.aetion.com/projects/details/1814/rwrs/78633>
- CMS NOAC - <https://bwh-dope.aetion.com/projects/details/1831/rwrs/78415>

Date conducted: 01/21/2022 and 01/28/2022

In order to complete the initial power analysis, a dummy outcome indicating a 90-day gap in database enrollment will be used. This

outcome is used to ensure that no information on the comparative risks of the outcomes of interest are available at this stage. A 1:1 PS-matched comparative analysis was performed, including age, gender, and CCI score as the only covariates. Power calculations are based on the formulas from Chow et al. (2008).

- Stop analyses until feasibility and power are reviewed by primary investigators and FDA. Reviewers evaluate the results of the analyses described above in Sections 7 and 8, including numbers of patients, patient characteristics, follow-up time, and reasons for censoring by treatment group, as well as overall rates of outcomes and study power. These parameters are re-evaluated and reported in the subsequent sections, after incorporating feedback and refining the protocol.

This emulation is of a trial that is not yet completed. The trial investigators have not published their power calculations. Therefore, we present a range of power calculations for different effect sizes given the feasibility counts and an alpha of 0.05. The range in potential hazard ratios comes from a meta-analysis of safety and efficacy studies of apixaban in patients with atrial fibrillation (Proietti et al. 2017). The target enrollment for the trial is 3,028 participants. We anticipate a pooled analytic cohort of 529,536 subjects.

1. Pooled

<b>Superiority Analysis - Pooled</b>					
Number of patients matched	454,312	454,312	454,312	454,312	454,312
Reference	227,156	227,156	227,156	227,156	227,156
Exposure	227,156	227,156	227,156	227,156	227,156
Risk per 1,000 patients	41.4155034	41.4155034	41.4155034	41.4155034	41.4155034
Alpha (2-sided)	0.05	0.05	0.05	0.05	0.05
Desired HR from RCT	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>
Number of events expected	18815.5602	18815.5602	18815.5602	18815.5602	18815.5602
Power	1	1	1	1	1

2. Optum CDM

Effectiveness research with Real World Data to support FDA's regulatory decision making

<b>Superiority Analysis - Optum</b>					
Number of patients matched	78,962	78,962	78,962	78,962	78,962
Reference	39,481	39,481	39,481	39,481	39,481
Exposure	39,481	39,481	39,481	39,481	39,481
Risk per 1,000 patients	19.8838767	19.8838767	19.8838767	19.8838767	19.8838767
Alpha (2-sided)	0.05	0.05	0.05	0.05	0.05
Desired HR from RCT	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>
Number of events expected	1570.07067	1570.07067	1570.07067	1570.07067	1570.07067
Power	0.99307189	0.99999984	1	1	1

3. IBM® MarketScan®

<b>Superiority Analysis - MarketScan</b>					
Number of patients matched	82,730	82,730	82,730	82,730	82,730
Reference	41,365	41,365	41,365	41,365	41,365
Exposure	41,365	41,365	41,365	41,365	41,365
Risk per 1,000 patients	28.0384028	28.0384028	28.0384028	28.0384028	28.0384028
Alpha (2-sided)	0.05	0.05	0.05	0.05	0.05
Desired HR from RCT	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>
Number of events expected	2319.61706	2319.61706	2319.61706	2319.61706	2319.61706
Power	0.99967945	1	1	1	1

4. CMS – NOAC

<b>Superiority Analysis – CMS NOAC</b>					
Number of patients matched	292,620	292,620	292,620	292,620	292,620

Reference	146,310	146,310	146,310	146,310	146,310
Exposure	146,310	146,310	146,310	146,310	146,310
Risk per 1,000 patients	52.5732835	52.5732835	52.5732835	52.5732835	52.5732835
Alpha (2-sided)	0.05	0.05	0.05	0.05	0.05
Desired HR from RCT	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>
Number of events expected	23075.9913	15383.9942	15383.9942	15383.9942	15383.9942
Power	1	1	1	1	1

5. Stop analyses until feasibility and power are reviewed by primary investigators, FDA, and assigned members of advisory board.

Reviewed by PI:		Date reviewed:	
Reviewed by FDA:		Date reviewed:	
Reasons for stopping analysis (if required):			

### 9. Balance Assessment

Action report name:

- Rivaroxaban versus Apixaban
  - Optum - <https://bwh-dope.aetion.com/projects/details/1813/rwrs/79770>
  - MarketScan - <https://bwh-dope.aetion.com/projects/details/1814/rwrs/79771>
  - CMS NOAC - <https://bwh-dope.aetion.com/projects/details/1831/rwrs/79772>

Date conducted: 02/25/2022

After review of initial feasibility and power analyses, complete creation of the remaining covariates from Section 6.2. Again, using the

dummy outcome of a 90-day gap in database enrollment, complete a 1:1 PS-matched analysis. The PS should include the complete list of covariates.

6. Provide plot of PS distributions stratified by treatment group.

a. **See Appendix B**

7. Report covariate balance after matching.

a. **See Appendix B**

i. CMS cell suppression policy may result in omitted data

8. Report reasons for censoring by treatment group.

<b>Censoring Reasons for Study Outcome</b>			
<b>Reasons</b>	<b>Overall</b>	<b>Referent</b>	<b>Exposure</b>
Death	0 (0.0%)	0 (0.0%)	0 (0.0%)
Start of an additional exposure	5,906 (1.1%)	2,416 (1.0%)	3,490 (1.2%)
End of index exposure	8,557 (1.6%)	4,649 (2.0%)	3,908 (1.3%)
Maximum follow-up time	328,427 (62.1%)	147,012 (63.8%)	181,415 (60.8%)
End of patient data	74,371 (14.1%)	31,658 (13.7%)	42,713 (14.3%)
End of patient enrollment	44,450 (8.4%)	16,025 (7.0%)	28,425 (9.5%)
Other Anticoagulant Therapy + Nursing Home Admission	22,230 (4.2%)	9,772 (4.2%)	12,458 (4.2%)

9. Report follow-up time by treatment group.

<b>FOLLOW-UP TIME FOR STUDY OUTCOME</b>			
<b>Median Follow-Up Time (Days) [IQR] – At 10 days gap</b>			
<b>Patient Group</b>	<b>Optum CDM</b>	<b>IBM® MarketScan®</b>	<b>CMS - NOAC</b>
Overall Patient Population	98 [38, 238]	98 [38, 227]	98 [38, 228]
Referent - Rivaroxaban	98 [38, 225]	98 [38, 224]	98 [38, 225]
Exposure - Apixaban	98 [38, 245]	98 [38, 231]	98 [38, 231]



## 10. Final Power Assessment

Date conducted: 02/09/2022

10. Re-calculate power in the appropriate excel table, using the revised number of matched patients from the PS-match in Section 9. All other parameters in the table should be the same as in Section 8.

### 1. Pooled

<b>Superiority Analysis - Pooled</b>					
Number of patients matched	368,214	368,214	368,214	368,214	368,214
Reference	184,107	184,107	184,107	184,107	184,107
Exposure	184,107	184,107	184,107	184,107	184,107
Risk per 1,000 patients	41.4155034	41.4155034	41.4155034	41.4155034	41.4155034
Alpha (2-sided)	0.05	0.05	0.05	0.05	0.05
Desired HR from RCT	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>
Number of events expected	15249.7682	15249.7682	15249.7682	15249.7682	15249.7682
Power	1	1	1	1	1

### 2. Optum CDM

<b>Superiority Analysis - Optum</b>					
Number of patients matched	68,134	68,134	68,134	68,134	68,134
Reference	34,067	34,067	34,067	34,067	34,067
Exposure	34,067	34,067	34,067	34,067	34,067
Risk per 1,000 patients	19.8838767	19.8838767	19.8838767	19.8838767	19.8838767
Alpha (2-sided)	0.05	0.05	0.05	0.05	0.05
Desired HR from RCT	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>

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Number of events expected	1354.76806	1354.76806	1354.76806	1354.76806	1354.76806
Power	0.98409053	0.99999793	1	1	1

3. IBM® MarketScan®

<b>Superiority Analysis - MarketScan</b>					
Number of patients matched	61,846	61,846	61,846	61,846	61,846
Reference	30,923	30,923	30,923	30,923	30,923
Exposure	30,923	30,923	30,923	30,923	30,923
Risk per 1,000 patients	28.0384028	28.0384028	28.0384028	28.0384028	28.0384028
Alpha (2-sided)	0.05	0.05	0.05	0.05	0.05
Desired HR from RCT	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>
Number of events expected	1734.06306	1734.06306	1734.06306	1734.06306	1734.06306
Power	0.99638561	0.99999998	1	1	1

4. CMS – NOAC

<b>Superiority Analysis – CMS NOAC</b>					
Number of patients matched	238,234	238,234	238,234	238,234	238,234
Reference	119,117	119,117	119,117	119,117	119,117
Exposure	119,117	119,117	119,117	119,117	119,117
Risk per 1,000 patients	52.5732835	52.5732835	52.5732835	52.5732835	52.5732835
Alpha (2-sided)	0.05	0.05	0.05	0.05	0.05
Desired HR from RCT	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>
Number of events expected	12524.7436	12524.7436	12524.7436	12524.7436	12524.7436
Power	1	1	1	1	1

- Stop analyses until balance and final power assessment are reviewed by primary investigators, FDA, and assigned members of advisory board.

Reviewed by PI:		Date reviewed:	
Reviewed by FDA:		Date reviewed:	
Reasons for stopping analysis (if required):			

### 11. Study Confidence and Concerns

Deadline for voting on study confidence and listing concerns:

Date votes and concerns are summarized:

- If final feasibility and power analyses are reviewed and approved, proceed to the remaining protocol steps.
- All study team and advisory board members that review this protocol should at this stage provide their level of confidence for the success of the RWD study in the [Google Form](#). This form also provides space for reviewers to list any concerns that they feel may contribute to a failure to replicate the findings of the RCT, including differences in study populations, poor measurement of study variables, or residual confounding. All responses will be kept confidential and individual-level results will only be shared with the individual respondent.
- After the deadline for voting has passed, provide the distribution of responses and summarize all concerns here.

### 12. Register study protocol on [clinicalTrials.gov](https://clinicaltrials.gov)

Date conducted:

- Register the study on [clinicalTrials.gov](https://clinicaltrials.gov) and upload this document.

### 13. Comparative Analyses

Action report name:

Date conducted:

13.1 For primary analysis:

13.2 For sensitivity analyses:

**14. Requested Results**

14.1 Table 1: Baseline characteristics before and after adjustment

Variable	Before adjustment			After adjustment		
	Referent	Exposure	Std. diff.	Referent	Exposure	Std. diff.
Number of patients			-			-
Age categories						
...						

14.2 Table 2: Follow-up time

Patient Group	Median Follow-Up Time (Days) [IQR]
Overall Patient Population	
Referent	
Exposure	

14.3 Table 3: Censoring events

	Overall	Referent	Exposure

Outcome			
Death			
Start of an additional exposure			
End of index exposure			
Specified date reached			
End of patient data			
End of patient enrollment			
...			

14.4 Table 4: Results from primary analyses:

Analysis	No. exposed events	No. referent events	Exposed rate	Referent rate	HR (95% CI)
Crude					
Analysis 1					
Analysis 2					
...					

HR, Hazard Ratio; CI, Confidence Interval.

14.5 Table 5: Results from secondary analyses:

**15. References**

1. Chow S, Shao J, Wang H. 2008. *Sample Size Calculations in Clinical Research*. 2nd Ed. Chapman & Hall/CRC Biostatistics Series. page 177
2. Proietti M, Romanazzi I, Romiti GF, Farcomeni A, Lip GYH. Real-World Use of Apixaban for Stroke Prevention in Atrial Fibrillation: A Systematic Review and Meta-Analysis. *Stroke*. 2018 Jan;49(1):98-106. doi: 10.1161/STROKEAHA.117.018395. Epub 2017 Nov 22. PMID: 29167388.

# Appendix A

#	COBRRA - AF trial definitions	Implementation in routine care	References/Rationale	Color coding
		Please see the following Google Drive for further details or any missing information: <a href="https://drive.google.com/drive/folders/1WD618wrywYJEaXzflTcuK-VCnt6b-gV?usp=sharing">https://drive.google.com/drive/folders/1WD618wrywYJEaXzflTcuK-VCnt6b-gV?usp=sharing</a>		
		ICD-10 codes are not listed in this document because of excel cell size limitations and excessive number of ICD-10 codes. Full ICD-10 code lists will be available in the above Google Drive Folder (link above). ICD-9 to ICD-10 code conversions were completed using a SAS macro that implements forward/ backward mapping based on the CMS ICD-9 to ICD-10 mapping		
	<b>TRIAL DETAILS</b>			Criteria
	<b>EXPOSURE vs. COMPARISON</b>			Can be replicated in claims
	Apixaban 5 mg PO, twice daily for 12 months of treatment. A dose reduction to 2.5 mg twice daily will apply if patients meet 2 of the following 3 criteria: age > 80 years, weight < 60 kg, creatinine > 133 micromol/L vs. Rivaroxaban 20 mg PO, once daily for 12 months of treatment. A dose reduction to 15 mg daily will apply to patients with creatinine clearance < 50 ml/min  *Patients with AF who are receiving DOAC should have their renal function assessed at baseline and at least annually	Apixaban: vs. Rivaroxaban:		Using dummy definitions for measuring in claims
	<b>PRIMARY OUTCOME</b>			Can't be measured in claims
	The rate of adjudicated clinically relevant bleeding (CRB) events [Time frame: For the duration of the study: 12 months] CRB events are defined as the composite of major bleeding (MB) events and clinically relevant non-major bleeding (CRNMB) events	Measured [0, 365] in any diagnosis position in an inpatient setting (transfusion codes required for non-critical sites)  <b>Major Bleeding:</b> See "Major Bleeding" Sheet  Measured [0, 365] in any diagnosis position in an inpatient setting (transfusion codes not required for non-critical sites) <b>Clinically Relevant Non-Major Bleeding Events:</b> See "CRNM Bleeds Sheet"	Graham DJ, Reichman ME, Wernecke M, et al. Stroke, Bleeding, and Mortality Risks in Elderly Medicare Beneficiaries Treated With Dabigatran or Rivaroxaban for Nonvalvular Atrial Fibrillation. JAMA Intern  doi:10.1001/jamainterm.2016.5954	Can't be measured in claims but not important for the analysis
	<b>INCLUSION CRITERIA</b>			
1	Confirmed new diagnosis of AF on ECG with an indication to start anticoagulation according to Canadian Cardiovascular Society guidelines	Measured [-180, 0] in any diagnosis position in either an inpatient or outpatient care setting  <b>Atrial fibrillation (Non-Valvular)</b> ICD-9 Diagnosis: 427.31 ICD-10 Diagnosis: I48.0, I48.1, I48.2, I48.91	Prescribing guidelines for AF in Canada: <a href="https://ccs.ca/app/uploads/2020/11/AF_Gui_2016_PG_EN_web.pdf">https://ccs.ca/app/uploads/2020/11/AF_Gui_2016_PG_EN_web.pdf</a>	
2	Age >= 18 years	Age >= 18		
	<b>EXCLUSION CRITERIA</b>			
		Measured [-180, 0] in prescription claims		
1	Have received >72 hours of therapeutic anticoagulation	<b>Use of Anticoagulants:</b> Adeparin Sodium, Porcine, Argatroban, Argatroban in 0.9% Sodium Chloride, Argatroban in Sodium Chloride, Iso-osmotic, Bivalirudin, Dabigatran Etexilate Mesylate, Dalteparin Sodium Porcine, Danaparoid Sodium Porcine, Desirudin, Edoxaban Tosylate, Enoxaparin Sodium, Fonaparinux Sodium, Heparin Sodium Beef, Heparin Sodium Porcine (0.45% NaCl, 0.9% NaCl, 0.9% NaCl/PF), Heparin Sodium Porcine/Dextrose (5% in water or 5% in water/PF), Heparin Sodium Procine/PF, Lepirudin Recombinant, Tinzaparin Sodium Porcine, and Warfarin Sodium		
2	Creatine clearance < 15 ml/min calculated with the Cockcroft-Gault formula	Measured [-180, 0] in any diagnosis position and inpatient or outpatient care setting  <b>CKD stage 4/5/ESRD</b> ICD-9 Diagnosis: 584.4x, 585.5x, 585.6x ICD-10 Diagnosis: N18.4x, N18.5x, N18.6x  <b>Dialysis/Renal Transplant</b> See Sheet "Dialysis and Renal Transplant"		
3	Any contradiction for anticoagulation with apixaban or rivaroxaban as determined by the treating physician such as, but not limited to one of the following:			
		Measured [-180, 0] in any diagnosis position and in an inpatient setting (transfusion codes required for non-critical sites)  <b>Major Bleeding</b> See "Major Bleeding" Sheet  Measured [-180,0] in any diagnosis position in an inpatient setting (transfusion codes not required for non-critical sites)  <b>Clinically Relevant Non-Major Bleeding Events</b> See "CRNM Bleeds Sheet"		
4	1) Active Bleeding			
		Measured [-180, 0] in any diagnosis position in an inpatient or outpatient setting: <b>DVT</b> ICD-9 Diagnosis: 451.1x, 451.2x, 451.81, 451.9x, 453.1x, 453.2x, 453.8x, 453.9x, 453.40, 453.41, 453.42, 453.0 ICD-10 Diagnosis: I80.1x, I80.2, I80.3, I80.9, I82.0, I82.1, I82.2x (except I82.21), I82.4x, I82.6x, I82.890, I82.90, I81.A1x, I82.B1x, I82.C1x  <b>PE</b> ICD-9 Diagnosis: 415.1, 415.10, 415.11, 415.12, 415.13, 415.5, 415.16, 417.17, 415.19, 415.199 ICD-10 Diagnosis: I26.0, I26.01, I26.02, I26.9, I26.92, I26.99, I26.90  <b>Prosthetic Heart Valve</b> ICD-9 Diagnosis: V43.3 ICD-10 Diagnosis: Z95.2		
5	2) Other Indication for anticoagulation (e.g. mechanical valves, venous thrombosis)			

# Appendix A

6	<p>3) Dual Antiplatelet Use</p> <p><b>Measured [-180, 0] in prescription claims</b></p> <p><b>Use of Antiplatelets</b> Any of the following: clostazol, dipyridamole, ticlopidine HCl, aspirin, clopidogrel bisulfate, prasugrel HCl, ticagerlor, aspirin/dipyridamole, ezetimibe</p>	
7	<p>4) Known liver disease with coagulopathy</p> <p><b>Measured [-180,0] in any diagnosis position in an inpatient or outpatient setting</b></p> <p><b>Significant Liver Disease</b> ICD-9 Diagnosis: 070.xx, 570.xx-573.xx, 456.0x-456.2x, 576.8x, 782.4x, 789.5x ICD-10 Diagnosis: B18.1, B17.11, B17.2, B17.9, B18.2, B18.8, K71.0, K71.10, K71.2, K71.3, K71.51, K72.01, K72.10, K73.9, K74.3, K74.69, K75.2, K75.81, K75.89, K76.0, K76.1, K76.3, K76.8, K76.89, B19.0, B19.9, I85.11, K71.11, K71.7, K71.9, K72.11, K74.1, K74.4, K74.5, K75.3, K76.7, K67, R18.8, B15.9, B16.0, B16.2, B16.9, B18.0, B18.9, B19.10, B19.11, K70.10, K70.41, K71.4, K71.50, K72.91, K74.0, K74.2, K74.60, K75.1, K76.2, K76.81, K83.8, R17, B15.0, B19.21, B25.1, I85.00, K70.0, K70.11, K70.2, K70.9, K72.00, K72.90, K73.1, K73.8, K75.0, K76.9, R18.0, B17.0, B17.10, B17.8, B18.1, B19.20, I85.01, I85.10, K70.30, K70.31, K70.40, K71.6, K71.8, K73.0, K73.2, K75.4, K75.9, K76.4, K76.5, K77, K83.5 ICD-9 Procedure: 39.1x, 42.91 ICD-10 Procedure: See "Liver Bypass" Sheet</p> <p><b>Coagulopathy</b> ICD-9 Diagnosis: 286, 286.1, 286.4, 286.5, 286.52, 286.53, 286.59, 287.5, 286.0, 286.2, 286.3, 286.6, 286.7, 286.9, 287.1, 287.3, 287.4 ICD-10 Dignosis: D67, D68, D68.1, D68.2, D68.3, D68.31, D68.311, D68.318, D68.4, D68.52, D68.61, D68.69, D68.8, D69.41, D69.49, D69.51, D69.59, D65, D66, D68.0, D68.312, D68.32, D68.5, D68.51, D68.59, D68.6, D68.62, D68.9, D69.1, D69.3, D69.4, D69.42, D69.5, D69.6</p>	
8	<p>5) Use of contraindicated medications (strong inducers/inhibitors of CYP 3A4/5, P-glycoprotein)</p> <p><b>Measured [-180, 0] in prescription claims</b></p> <p><b>Strong CYP3A4 Inhibitors/Inducers</b> Inhibitors: Ketoconazole, itraconazole, voriconazole, telithromycin, clarithromycin, nefazodone, ritonavir, saquinavir, nelfinavir, indinavir, atazanavir Inducers: Rifampin, rifampicin/rifampin, phenytoin, carbamazepine</p> <p><b>P-gp Inhibitors/Inducers</b> cobcicistat, conivaptan, tipranavir</p>	<p><a href="https://depts.washington.edu/anticoag/home/content/apixaban">https://depts.washington.edu/anticoag/home/content/apixaban</a></p>
9	<p>6) Pregnancy</p> <p><b>Measured [-180, 0] in any diagnosis position and inpatient and outpatient care setting</b></p> <p><b>Pregnancy</b> See "Pregnancy" Sheet</p>	
10	<p>7) Active malignancy, defined as a) diagnosed with cancer within the past 6 months; or b) recurrent, regionally advanced or metastatic disease; or c) currently receiving treatment or have received any treatment for cancer during the 6 months prior to randomization; or d) a hematologic malignancy not in complete remission</p> <p><b>Measured [-180, 0] in any diagnosis position in an inpatient or outpatient setting</b></p> <p><b>Cancer</b> ICD-9 Diagnosis: 140.x-209.x (except 209.4x, 209.5x, 209.6x) ICD-10 Diagnosis: C00.x-C96, D45 For full list, see "Cancer Sheet"</p>	
11	<p>8) Weight &gt; 120 kg</p> <p><b>Measured [-180,0] in any diagnosis position in an inpatient or outpatient setting:</b></p> <p><b>Bypass Surgery</b> HCPCS: 43659, 43999, 43842, S2082, 43644, 43645, 43770, 43843, 43845, 43846, 43847 ICD-9 Procedure: 43.89, 44.69, 44.31, 44.39, 44.95, 45.51, 45.91, 43.82, 44.38, 44.68 ICD-10 Procedure: 0D160JB, 0D160KL, 0D160Z9, 0D164JL, 0D1687L, 0D168JB, 0D168Z9, 0D168ZL, 0D190ZA, 0D194J9, 0D194K9, 0D194ZA, 0D198K9, 0D198ZA, 0D1A0JB, 0D1A0ZB, 0D1A87A, 0D1A8JB, 0D1A8KA, 0D1A8KB, 0D1B4JB, 0D1B4KB, 0D1B8JB, 0D760DZ, 0D863Z3, 0DB87ZZ, 0DB90ZZ, 0DM64ZZ, 0DN67ZZ, 0DQ64ZZ, 0DV60CZ, 0DV63CZ, 0D16079, 0D1607A, 0D1607L, 0D160ZL, 0D164J9, 0D164KA, 0D164KL, 0D1687A, 0D168JB, 0D168ZA, 0D190K9, 0D190KB, 0D19479, 0D1947B, 0D194JA, 0D194KB, 0D1987A, 0D198ZB, 0D1A07A, 0D1A0KB, 0D1A47A, 0D1A4KA, 0D1A4ZB, 0D1A8ZA, 0D1A8ZB, 0D1B0JB, 0D763DZ, 0D764ZZ, 0DB60Z3, 0DB67Z3, 0DB68Z3, 0DQ68ZZ, 0DU64KZ, 0DU67ZZ, 0DU67KZ, 0DU687Z, 0DU68JZ, 0DU68KZ, 0DV63ZZ, 0DV64CZ, 0DV64DZ, 0D164Z9, 0D168JL, 0D168KA, 0D168KB, 0D168ZB, 0D190Z9, 0D1947A, 0D194KA, 0D194ZB, 0D1987B, 0D1A07B, 0D1A0JA, 0D1A4JA, 0D1A4KB, 0D763ZZ, 0D764DZ, 0DB63ZZ, 0DBB0ZZ, 0DF67ZZ, 0DF68ZZ, 0DN60ZZ, 0DQ60ZZ, 0DU60KZ, 0DU647Z, 0DU64JZ, 0DV60ZZ, 0DV64ZZ, 0D1607B, 0D160JL, 0D160K9, 0D160JA, 0D164JB, 0D1687B, 0D1907B, 0D19079, 0D190JB, 0D190ZB, 0D194Z9, 0D198J9, 0D198KA, 0D1A0ZA, 0D1A47B, 0D1A4JB, 0D1A4ZA, 0D1A8JA, 0D1B47B, 0D1B4ZB, 0D1B8KB, 0D1B8ZB, 0D760ZZ, 0DB64Z3, 0DM60ZZ, 0DN63ZZ, 0DN64ZZ, 0DN68ZZ, 0DU607Z, 0DU60JZ, 0DV60DZ, 0DV63DZ, 0D160J9, 0D160JA, 0D160KB, 0D160ZA, 0D160ZB, 0D16479, 0D1647A, 0D1647B, 0D1647L, 0D164JA, 0D164K9, 0D164KB, 0D164ZA, 0D164ZL, 0D16879, 0D168JA, 0D168K9, 0D168KL, 0D19079, 0D1907A, 0D190JA, 0D190KA, 0D194JB, 0D19879, 0D198JA, 0D198JB, 0D198KB, 0D198Z9, 0D1A0KA, 0D1A87B, 0D1A8ZB, 0D1B07B, 0D1B0KB, 0D1B0ZB, 0D1B87B, 0D1B8ZB, 0DB60ZZ, 0DB80ZZ, 0DF60ZZ, 0DF63ZZ, 0DF64ZZ, 0DQ63ZZ, 0DQ67ZZ, 0DU67JZ, 0DV67ZZ, 0DV68ZZ</p> <p><b>Obesity</b> ICD-9 Diagnosis: 539.89, 649.1, V85.36, V85.41, V85.42, 649.10, 649.11, 649.20, 649.23, V85.37, V85.44, 278.01, 278.03, 539, 649.13, 649.14, 649.2, 649.22, 649.24, V85.31, V85.34, V85.35, V85.43, 278.0, 278.00, 539.09, 539.8, 539.81, 649.12, 649.21, V85.38, V85.39, 539.0, 539.01, V85.30, V85.32, V85.33, V85.45 ICD-10 Diagnosis: O99.215, Z68.41, O99.210, O99.214, O99.844, Z68.35, Z68.38, Z68.43, Z68.45, O99.845, Z68.32, Z68.33, Z68.36, O99.212, O99.841, O99.842, Z68.34, Z68.37, Z68.42, O99.211, O99.213, O99.840, O99.843, Z68.30, Z68.31, Z68.39, Z68.44</p> <p><b>Weight Loss and Appetite Suppressors</b> FENFLURAMINE HCL, DIETHYLPROPION HCL, PHENDIMETRAZINE TARTRATE, PHENTERMINE HCL</p>	

# Appendix A

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Measured [-180, 0] in any diagnosis position and inpatient and outpatient care setting

**Mitral Stenosis**  
ICD-9 Diagnosis: 394.0  
ICD-10 Diagnosis: I05.0

**Mitral Rheumatic Insufficiency**  
ICD-9 Diagnosis: 394.1  
ICD-10 Diagnosis: I05.1

**Mitral Stenosis with Insufficiency**  
ICD-9 Diagnosis: 394.2  
ICD-10 Diagnosis: I05.2

**Other and Unspecified Mitral Valve Disorders**  
ICD-9 Diagnosis: 394.9  
ICD-10 Diagnosis: I05.9, I05.8

**Prosthetic Heart Valve**  
ICD-9 Diagnosis: V43.3  
ICD-10 Diagnosis: Z95.2

9) Other Heart Conditions



## **Appendix A**

### **Information from Trial**

**Trial Name: COBRRRA - AF <https://clinicaltrials.gov/ct2/show/NCT04642430>**

**NCT: NCT04642430**

**Therapeutic Area: Cardiology**

**RCT Category: Equivalence/Superiority**

**Brand Name: Eliquis and Xarelto**

**Generic Name: Apixaban and Rivaroxaban**

**Sponsor: Ottwa Hospital Research Institute**

**Year: 2020 - Present**

**Measurable Endpoint: Major Bleeding and Clinically Relevant Non-Major Bleeding**

**Exposure: Apixaban**

**Comparator: Rivaroxaban**

**Populuation: Men and women ages 18 and older presenting with AF**

**No. of Patients: 3,018**

**Power: TBD**

# Appendix A

ICD-9 Dx	
336.1	VASCULAR MYELOPATHIES
363.61	CHOROIDDAL HEMORRHAGE UNSPECIFIED
363.62	EXPULSIVE CHOROIDDAL HEMORRHAGE
376.32	ORBITAL HEMORRHAGE
377.42	HEMORRHAGE IN OPTIC NERVE SHEATHS
379.23	VITREOUS HEMORRHAGE
431	INTRACEREBRAL HEMORRHAGE
432	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE
432	NONTRAUMATIC EXTRADURAL HEMORRHAGE
432.1	SUBDURAL HEMORRHAGE
432.9	UNSPECIFIED INTRACRANIAL HEMORRHAGE
719.1	HEMARTHROSIS
719.11	HEMARTHROSIS INVOLVING SHOULDER REGION
719.12	HEMARTHROSIS INVOLVING UPPER ARM
719.14	HEMARTHROSIS INVOLVING HAND
719.15	HEMARTHROSIS INVOLVING PELVIC REGION AND THIGH
719.17	HEMARTHROSIS INVOLVING ANKLE AND FOOT
719.19	HEMARTHROSIS INVOLVING MULTIPLE SITES
729.92	NONTRAUMATIC HEMATOMA OF SOFT TISSUE
852	SUBARACHNOID SUBDURAL AND EXTRADURAL HEMORRHAGE FOLLOWING INJURY
852	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH STATE OF CONSCIOUSNESS UNSPECIFIED
852.01	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH NO LOSS OF CONSCIOUSNESS
852.03	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH MODERATE (1 - 24 HOURS) LOSS OF CONSCIOUSNESS
852.05	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS WITHOUT RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.06	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH LOSS OF CONSCIOUSNESS OF UNSPECIFIED DURATION
852.09	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH CONCUSSION UNSPECIFIED
852.1	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH STATE OF CONSCIOUSNESS UNSPECIFIED
852.11	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH NO LOSS OF CONSCIOUSNESS
852.12	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH BRIEF (LESS THAN ONE HOUR) LOSS OF CONSCIOUSNESS
852.15	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS WITHOUT RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.19	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH CONCUSSION UNSPECIFIED
852.2	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH STATE OF CONSCIOUSNESS UNSPECIFIED
852.22	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH BRIEF (LESS THAN ONE HOUR) LOSS OF CONSCIOUSNESS
852.25	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS WITHOUT RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.3	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND
852.3	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH STATE OF CONSCIOUSNESS UNSPECIFIED
852.31	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH NO LOSS OF CONSCIOUSNESS
852.32	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH BRIEF (LESS THAN ONE HOUR) LOSS OF CONSCIOUSNESS
852.33	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH MODERATE (1-24 HOURS) LOSS OF CONSCIOUSNESS
852.34	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS AND RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.35	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS WITHOUT RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.42	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH BRIEF (LESS THAN 1 HOUR) LOSS OF CONSCIOUSNESS
852.43	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH MODERATE
852.45	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS WITHOUT RETURN TO PRE-24 HOURS) LOSS OF CONSCIOUSNESS-EXISTING CONSCIOUS LEVEL
852.49	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH CONCUSSION UNSPECIFIED
852.54	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS AND RETURN TO PRE-EXISTING CONSCIOUS LEVEL
853	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY
853	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH STATE OF CONSCIOUSNESS UNSPECIFIED
853.01	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH NO LOSS OF CONSCIOUSNESS
853.03	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH MODERATE (1-24 HOURS) LOSS OF CONSCIOUSNESS
853.04	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS AND RETURN TO PRE-EXISTING CONSCIOUS LEVEL
853.05	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS WITHOUT RETURN TO PRE-EXISTING CONSCIOUS LEVEL
853.1	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND
853.11	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH NO LOSS OF CONSCIOUSNESS
853.12	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH BRIEF (LESS THAN ONE HOUR) LOSS OF CONSCIOUSNESS
853.13	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH MODERATE (1-24 HOURS) LOSS OF CONSCIOUSNESS
853.14	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS AND RETURN TO PRE-EXISTING CONSCIOUS LEVEL
853.15	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS WITHOUT RETURN TO PRE-EXISTING CONSCIOUS LEVEL
866.02	LACERATION OF KIDNEY WITHOUT OPEN WOUND INTO CAVITY

# Appendix A

363.72	HEMORRHAGIC CHOROIDAL DETACH
423	HEMOPERICARDIUM
430	SUBARACHNOID HEMORRHAGE
568.81	HEMOPERITONEUM (NONTRAUMATIC)
719.1	HEMARTHROSIS SITE UNSPECIFIED
719.13	HEMARTHROSIS INVOLVING FOREARM
719.16	HEMARTHROSIS INVOLVING LOWER LEG
719.18	HEMARTHROSIS INVOLVING OTHER SPECIFIED SITES
852	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT MENTION OF OPEN INTRACRANIAL WOUND
852.02	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH BRIEF (LESS THAN ONE HOUR) LOSS OF CONSCIOUSNESS
852.04	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS AND RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.1	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND
852.13	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH MODERATE (1-24 HOURS) LOSS OF CONSCIOUSNESS
852.14	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS AND RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.16	SUBARACHNOID HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH LOSS OF CONSCIOUSNESS OF UNSPECIFIED DURATION
852.2	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT MENTION OF OPEN INTRACRANIAL WOUND
852.21	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH NO LOSS OF CONSCIOUSNESS
852.23	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH MODERATE (1-24 HOURS) LOSS OF CONSCIOUSNESS
852.24	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS AND RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.26	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH LOSS OF CONSCIOUSNESS OF UNSPECIFIED DURATION
852.29	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH CONCUSSION UNSPECIFIED
852.36	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH LOSS OF CONSCIOUSNESS OF UNSPECIFIED DURATION
852.39	SUBDURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH CONCUSSION UNSPECIFIED
852.4	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT MENTION OF OPEN INTRACRANIAL WOUND
852.4	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH STATE OF CONSCIOUSNESS UNSPECIFIED
852.41	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH NO LOSS OF CONSCIOUSNESS
852.44	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS AND RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.46	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH LOSS OF CONSCIOUSNESS OF UNSPECIFIED DURATION
852.5	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND
852.5	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH STATE OF CONSCIOUSNESS UNSPECIFIED
852.51	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH NO LOSS OF CONSCIOUSNESS
852.52	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH BRIEF (LESS THAN ONE HOUR) LOSS OF CONSCIOUSNESS
852.53	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH MODERATE (1-24 HOURS) LOSS OF CONSCIOUSNESS
852.55	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH PROLONGED (MORE THAN 24 HOURS) LOSS OF CONSCIOUSNESS WITHOUT RETURN TO PRE-EXISTING CONSCIOUS LEVEL
852.56	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH LOSS OF CONSCIOUSNESS OF UNSPECIFIED DURATION
852.59	EXTRADURAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH CONCUSSION UNSPECIFIED
853	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT MENTION OF OPEN INTRACRANIAL WOUND
853.02	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH BRIEF (LESS THAN ONE HOUR) LOSS OF CONSCIOUSNESS
853.06	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH LOSS OF CONSCIOUSNESS OF UNSPECIFIED
853.09	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITHOUT OPEN INTRACRANIAL WOUND WITH CONCUSSION UNSPECIFIED
853.1	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH STATE OF CONSCIOUSNESS UNSPECIFIED
853.16	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH LOSS OF CONSCIOUSNESS OF UNSPECIFIED DURATION
853.19	OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY WITH OPEN INTRACRANIAL WOUND WITH CONCUSSION UNSPECIFIED
866.01	HEMATOMA OF KIDNEY WITHOUT RUPTURE OF CAPSULE WITHOUT OPEN WOUND INTO CAVITY
866.11	HEMATOMA OF KIDNEY WITHOUT RUPTURE OF CAPSULE WITH OPEN WOUND INTO CAVITY
866.12	LACERATION OF KIDNEY WITH OPEN WOUND INTO CAVIT

The occurrence of Inpatient Confinement with the following attributes:

<b>Procedure Code (Any Confinement Position)</b>	is any of: { "99.05", "99.03", "99.04", "99.06" }
99.05	TRANSFUSION OF PLATELETS
99.03	OTHER TRANSFUSION OF WHOLE BLOOD
99.04	TRANSFUSION OF PACKED CELLS
99.06	TRANSFUSION OF COAGULATION FACTORS

AND  
ICD-9 Dx

# Appendix A

455.1	INTERNAL THROMBOSED HEMORRHOIDS
455.7	UNSPECIFIED THROMBOSED HEMORRHOIDS
455.8	UNSPECIFIED HEMORRHOIDS WITH OTHER COMPLICATION
455.9	RESIDUAL HEMORRHOIDAL SKIN TAGS
459	HEMORRHAGE UNSPECIFIED
530.1	ESOPHAGITIS
530.1	ESOPHAGITIS UNSPECIFIED
530.13	EOSINOPHILIC ESOPHAGITIS
530.19	OTHER ESOPHAGITIS
530.7	GASTROESOPHAGEAL LACERATION-HEMORRHAGE SYNDROME
530.82	ESOPHAGEAL HEMORRHAGE
531	ACUTE GASTRIC ULCER WITH HEMORRHAGE
531.01	ACUTE GASTRIC ULCER WITH HEMORRHAGE WITH OBSTRUCTION
531.2	ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
531.21	ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
531.3	ACUTE GASTRIC ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
531.4	CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
531.5	CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH PERFORATION
531.6	CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
531.61	CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
531.7	CHRONIC GASTRIC ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
531.9	GASTRIC ULCER UNSPECIFIED AS ACUTE OR CHRONIC WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
532	ACUTE DUODENAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
532.01	ACUTE DUODENAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION
532.1	ACUTE DUODENAL ULCER WITH PERFORATION
532.3	ACUTE DUODENAL ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
532.4	CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE
532.41	CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION
532.5	CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH PERFORATION
532.9	DUODENAL ULCER UNSPECIFIED AS ACUTE OR CHRONIC WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
533.1	ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH PERFORATION
533.2	ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION
533.21	ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
533.4	CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITHOUT OBSTRUCTION
533.41	CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITH OBSTRUCTION
533.5	CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH PERFORATION
533.6	CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION
533.9	PEPTIC ULCER OF UNSPECIFIED SITE UNSPECIFIED AS ACUTE OR CHRONIC WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
534	ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE
534.2	ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION
534.21	ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
534.4	CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE
534.4	CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
534.6	CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION
534.6	CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
534.9	GASTROJEJUNAL ULCER UNSPECIFIED AS ACUTE OR CHRONIC WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
535.11	ATROPHIC GASTRITIS WITH HEMORRHAGE
535.31	ALCOHOLIC GASTRITIS WITH HEMORRHAGE
535.4	OTHER SPECIFIED GASTRITIS (WITHOUT HEMORRHAGE)
535.51	UNSPECIFIED GASTRITIS AND GASTRODUODENITIS WITH HEMORRHAGE
535.61	DUODENITIS WITH HEMORRHAGE
562.01	DIVERTICULITIS OF SMALL INTESTINE (WITHOUT HEMORRHAGE)
562.03	DIVERTICULITIS OF SMALL INTESTINE WITH HEMORRHAGE
562.11	DIVERTICULITIS OF COLON (WITHOUT HEMORRHAGE)
562.12	DIVERTICULOSIS OF COLON WITH HEMORRHAGE
569.85	ANGIODYSPLASIA OF INTESTINE WITH HEMORRHAGE
578.1	BLOOD IN STOOL
599.71	GROSS HEMATURIA
623.8	OTHER SPECIFIED NONINFLAMMATORY DISORDERS OF VAGINA
626.8	OTHER DISORDERS OF MENSTRUATION AND OTHER ABNORMAL BLEEDING FROM FEMALE GENITAL TRACT

# Appendix A

784.7	EPISTAXIS
784.8	HEMORRHAGE FROM THROAT
786.3	HEMOPTYSIS
786.39	OTHER HEMOPTYSIS
280	IRON DEFICIENCY ANEMIA SECONDARY TO BLOOD LOSS (CHRONIC)
285.1	ACUTE POSTHEMORRHAGIC ANEMIA
455.2	INTERNAL HEMORRHOIDS WITH OTHER COMPLICATION
455.4	EXTERNAL THROMBOSED HEMORRHOIDS
455.5	EXTERNAL HEMORRHOIDS WITH OTHER COMPLICATION
455.6	UNSPECIFIED HEMORRHOIDS WITHOUT COMPLICATION
456	ESOPHAGEAL VARICES WITH BLEEDING
456.2	ESOPHAGEAL VARICES IN DISEASES CLASSIFIED ELSEWHERE WITH BLEEDING
530.11	REFLUX ESOPHAGITIS
530.12	ACUTE ESOPHAGITIS
531	ACUTE GASTRIC ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
531.1	ACUTE GASTRIC ULCER WITH PERFORATION
531.2	ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION
531.4	CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE
531.41	CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE WITH OBSTRUCTION
531.6	CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION
532	ACUTE DUODENAL ULCER WITH HEMORRHAGE
532.2	ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION
532.2	ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
532.21	ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
532.4	CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
532.6	CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION
532.6	CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
532.61	CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
532.7	CHRONIC DUODENAL ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
533	ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE
533	ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITHOUT OBSTRUCTION
533.01	ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITH OBSTRUCTION
533.2	ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
533.3	ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITHOUT MENTION OF HEMORRHAGE AND PERFORATION
533.4	CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE
533.6	CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
533.61	CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
533.7	CHRONIC PEPTIC ULCER OF UNSPECIFIED SITE WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
534	ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
534.01	ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION
534.1	ACUTE GASTROJEJUNAL ULCER WITH PERFORATION
534.2	ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
534.3	ACUTE GASTROJEJUNAL ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
534.41	CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION
534.5	CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH PERFORATION
534.61	CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
534.7	CHRONIC GASTROJEJUNAL ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION
535	ACUTE GASTRITIS (WITHOUT HEMORRHAGE)
535.01	ACUTE GASTRITIS WITH HEMORRHAGE
535.1	ATROPHIC GASTRITIS (WITHOUT HEMORRHAGE)
535.2	GASTRIC MUCOSAL HYPERTROPHY (WITHOUT HEMORRHAGE)
535.21	GASTRIC MUCOSAL HYPERTROPHY WITH HEMORRHAGE
535.3	ALCOHOLIC GASTRITIS (WITHOUT HEMORRHAGE)
535.41	OTHER SPECIFIED GASTRITIS WITH HEMORRHAGE
535.5	UNSPECIFIED GASTRITIS AND GASTRODUODENITIS (WITHOUT HEMORRHAGE)
535.6	DUODENITIS (WITHOUT HEMORRHAGE)
537.83	ANGIODYSPLASIA OF STOMACH AND DUODENUM WITH HEMORRHAGE
562	DIVERTICULOSIS OF SMALL INTESTINE (WITHOUT HEMORRHAGE)
562.02	DIVERTICULOSIS OF SMALL INTESTINE WITH HEMORRHAGE
562.1	DIVERTICULOSIS OF COLON (WITHOUT HEMORRHAGE)

# Appendix A

562.13	DIVERTICULITIS OF COLON WITH HEMORRHAGE
569.3	HEMORRHAGE OF RECTUM AND ANUS
578	HEMATEMESIS
578.9	HEMORRHAGE OF GASTROINTESTINAL TRACT UNSPECIFIED
593.81	VASCULAR DISORDERS OF KIDNEY
599.7	HEMATURIA UNSPECIFIED
623.6	VAGINAL HEMATOMA
626.6	METRORRHAGIA
786.3	HEMOPTYSIS UNSPECIFIED
786.31	ACUTE IDIOPATHIC PULMONARY HEMORRHAGE IN INFANTS

## ICD-10 Dx

G95.19	Other vascular myelopathies
H05.232	Hemorrhage of left orbit
H05.239	Hemorrhage of unspecified orbit
H31.30	Unspecified choroidal hemorrhage
H31.301	Unspecified choroidal hemorrhage, right eye
H31.303	Unspecified choroidal hemorrhage, bilateral
H31.312	Expulsive choroidal hemorrhage, left eye
H31.313	Expulsive choroidal hemorrhage, bilateral
H31.411	Hemorrhagic choroidal detachment, right eye
H31.419	Hemorrhagic choroidal detachment, unspecified eye
H43.1	Vitreous hemorrhage
H43.10	Vitreous hemorrhage, unspecified eye
H43.11	Vitreous hemorrhage, right eye
H43.13	Vitreous hemorrhage, bilateral
H47.022	Hemorrhage in optic nerve sheath, left eye
H47.023	Hemorrhage in optic nerve sheath, bilateral
H47.029	Hemorrhage in optic nerve sheath, unspecified eye
I60.0	Nontraumatic subarachnoid hemorrhage from carotid siphon and bifurcation
I60.00	Nontraumatic subarachnoid hemorrhage from unspecified carotid siphon and bifurcation
I60.01	Nontraumatic subarachnoid hemorrhage from right carotid siphon and bifurcation
I60.1	Nontraumatic subarachnoid hemorrhage from middle cerebral artery
I60.11	Nontraumatic subarachnoid hemorrhage from right middle cerebral artery
I60.31	Nontraumatic subarachnoid hemorrhage from right posterior communicating artery
I60.4	Nontraumatic subarachnoid hemorrhage from basilar artery
I60.51	Nontraumatic subarachnoid hemorrhage from right vertebral artery
I60.7	Nontraumatic subarachnoid hemorrhage from unspecified intracranial artery
I60.8	Other nontraumatic subarachnoid hemorrhage
I61.0	Nontraumatic intracerebral hemorrhage in hemisphere, subcortical
I61.2	Nontraumatic intracerebral hemorrhage in hemisphere, unspecified
I61.3	Nontraumatic intracerebral hemorrhage in brain stem
I61.5	Nontraumatic intracerebral hemorrhage, intraventricular
I61.6	Nontraumatic intracerebral hemorrhage, multiple localized
I61.8	Other nontraumatic intracerebral hemorrhage
I62	Other and unspecified nontraumatic intracranial hemorrhage
I62.0	Nontraumatic subdural hemorrhage
I62.00	Nontraumatic subdural hemorrhage, unspecified
I62.01	Nontraumatic acute subdural hemorrhage
I62.02	Nontraumatic subacute subdural hemorrhage
I62.9	Nontraumatic intracranial hemorrhage, unspecified
K66.1	Hemoperitoneum
M25.0	Hemarthrosis
M25.01	Hemarthrosis, shoulder
M25.012	Hemarthrosis, left shoulder
M25.019	Hemarthrosis, unspecified shoulder
M25.021	Hemarthrosis, right elbow
M25.029	Hemarthrosis, unspecified elbow
M25.03	Hemarthrosis, wrist
M25.039	Hemarthrosis, unspecified wrist
M25.05	Hemarthrosis, hip

# Appendix A

M25.051	Hemarthrosis, right hip
M25.052	Hemarthrosis, left hip
M25.06	Hemarthrosis, knee
M25.061	Hemarthrosis, right knee
M25.07	Hemarthrosis, ankle and foot
M25.071	Hemarthrosis, right ankle
M25.073	Hemarthrosis, unspecified ankle
M25.074	Hemarthrosis, right foot
M25.075	Hemarthrosis, left foot
M25.08	Hemarthrosis, other specified site
M79.81	Nontraumatic hematoma of soft tissue
S06.4	Epidural hemorrhage
S06.4X	Epidural hemorrhage
S06.4X0	Epidural hemorrhage without loss of consciousness
S06.4X0D	Epidural hemorrhage without loss of consciousness, subsequent encounter
S06.4X1A	Epidural hemorrhage with loss of consciousness of 30 minutes or less, initial encounter
S06.4X2S	Epidural hemorrhage with loss of consciousness of 31 minutes to 59 minutes, sequela
S06.4X3	Epidural hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes
S06.4X3A	Epidural hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, initial encounter
S06.4X4	Epidural hemorrhage with loss of consciousness of 6 hours to 24 hours
S06.4X4A	Epidural hemorrhage with loss of consciousness of 6 hours to 24 hours, initial encounter
S06.4X5D	Epidural hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, subsequent encounter
S06.4X5S	Epidural hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, sequela
S06.4X6D	Epidural hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, subsequent encounter
S06.4X7	Epidural hemorrhage with loss of consciousness of any duration with death due to brain injury prior to regaining consciousness
S06.4X7A	Epidural hemorrhage with loss of consciousness of any duration with death due to brain injury prior to regaining consciousness, initial encounter
S06.4X9	Epidural hemorrhage with loss of consciousness of unspecified duration
S06.4X9A	Epidural hemorrhage with loss of consciousness of unspecified duration, initial encounter
S06.5	Traumatic subdural hemorrhage
S06.5X	Traumatic subdural hemorrhage
S06.5X0	Traumatic subdural hemorrhage without loss of consciousness
S06.5X2	Traumatic subdural hemorrhage with loss of consciousness of 31 minutes to 59 minutes
S06.5X2A	Traumatic subdural hemorrhage with loss of consciousness of 31 minutes to 59 minutes, initial encounter
S06.5X3A	Traumatic subdural hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, initial encounter
S06.5X3D	Traumatic subdural hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, subsequent encounter
S06.5X3S	Traumatic subdural hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, sequela
S06.5X4S	Traumatic subdural hemorrhage with loss of consciousness of 6 hours to 24 hours, sequela
S06.5X5	Traumatic subdural hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level
S06.5X5A	Traumatic subdural hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, initial encounter
S06.5X5S	Traumatic subdural hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, sequela
S06.5X6A	Traumatic subdural hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, initial encounter
S06.5X6D	Traumatic subdural hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, subsequent encounter
S06.5X6S	Traumatic subdural hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, sequela
S06.5X8	Traumatic subdural hemorrhage with loss of consciousness of any duration with death due to other cause before regaining consciousness
S06.5X9A	Traumatic subdural hemorrhage with loss of consciousness of unspecified duration, initial encounter
S06.5X9D	Traumatic subdural hemorrhage with loss of consciousness of unspecified duration, subsequent encounter
S06.5X9S	Traumatic subdural hemorrhage with loss of consciousness of unspecified duration, sequela
S06.6X	Traumatic subarachnoid hemorrhage
S06.6X0	Traumatic subarachnoid hemorrhage without loss of consciousness
S06.6X0A	Traumatic subarachnoid hemorrhage without loss of consciousness, initial encounter
S06.6X0D	Traumatic subarachnoid hemorrhage without loss of consciousness, subsequent encounter
S06.6X1	Traumatic subarachnoid hemorrhage with loss of consciousness of 30 minutes or less
S06.6X1A	Traumatic subarachnoid hemorrhage with loss of consciousness of 30 minutes or less, initial encounter
S06.6X1S	Traumatic subarachnoid hemorrhage with loss of consciousness of 30 minutes or less, sequela
S06.6X2D	Traumatic subarachnoid hemorrhage with loss of consciousness of 31 minutes to 59 minutes, subsequent encounter
S06.6X3D	Traumatic subarachnoid hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, subsequent encounter
S06.6X4	Traumatic subarachnoid hemorrhage with loss of consciousness of 6 hours to 24 hours
S06.6X4A	Traumatic subarachnoid hemorrhage with loss of consciousness of 6 hours to 24 hours, initial encounter
S06.6X4S	Traumatic subarachnoid hemorrhage with loss of consciousness of 6 hours to 24 hours, sequela
S06.6X5	Traumatic subarachnoid hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level

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S06.6X5S	Traumatic subarachnoid hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, sequela
S06.6X6	Traumatic subarachnoid hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving
S06.6X6A	Traumatic subarachnoid hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, initial encounter
S06.6X6S	Traumatic subarachnoid hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, sequela
S06.6X7	Traumatic subarachnoid hemorrhage with loss of consciousness of any duration with death due to brain injury prior to regaining consciousness
S06.6X8A	Traumatic subarachnoid hemorrhage with loss of consciousness of any duration with death due to other cause prior to regaining consciousness, initial encounter
S06.6X9S	Traumatic subarachnoid hemorrhage with loss of consciousness of unspecified duration, sequela
S26.0	Injury of heart with hemopericardium
S26.01	Contusion of heart with hemopericardium
S26.01XA	Contusion of heart with hemopericardium, initial encounter
S26.020	Mild laceration of heart with hemopericardium
S26.020A	Mild laceration of heart with hemopericardium, initial encounter
S26.021D	Moderate laceration of heart with hemopericardium, subsequent encounter
S26.021S	Moderate laceration of heart with hemopericardium, sequela
S26.022	Major laceration of heart with hemopericardium
S26.022D	Major laceration of heart with hemopericardium, subsequent encounter
S26.09	Other injury of heart with hemopericardium
S26.09XD	Other injury of heart with hemopericardium, subsequent encounter
S26.09XS	Other injury of heart with hemopericardium, sequela
S37.01	Minor contusion of kidney
S37.011D	Minor contusion of right kidney, subsequent encounter
S37.011S	Minor contusion of right kidney, sequela
S37.012A	Minor contusion of left kidney, initial encounter
S37.012D	Minor contusion of left kidney, subsequent encounter
S37.012S	Minor contusion of left kidney, sequela
S37.02	Major contusion of kidney
S37.021	Major contusion of right kidney
S37.021D	Major contusion of right kidney, subsequent encounter
S37.021S	Major contusion of right kidney, sequela
S37.022D	Major contusion of left kidney, subsequent encounter
S37.022S	Major contusion of left kidney, sequela
S37.029	Major contusion of unspecified kidney
S37.031A	Laceration of right kidney, unspecified degree, initial encounter
S37.031D	Laceration of right kidney, unspecified degree, subsequent encounter
S37.032	Laceration of left kidney, unspecified degree
S37.032D	Laceration of left kidney, unspecified degree, subsequent encounter
S37.032S	Laceration of left kidney, unspecified degree, sequela
S37.039	Laceration of unspecified kidney, unspecified degree
S37.039D	Laceration of unspecified kidney, unspecified degree, subsequent encounter
S37.04	Minor laceration of kidney
S37.041	Minor laceration of right kidney
S37.041A	Minor laceration of right kidney, initial encounter
S37.041D	Minor laceration of right kidney, subsequent encounter
S37.041S	Minor laceration of right kidney, sequela
S37.042A	Minor laceration of left kidney, initial encounter
S37.042D	Minor laceration of left kidney, subsequent encounter
S37.042S	Minor laceration of left kidney, sequela
S37.051	Moderate laceration of right kidney
S37.051A	Moderate laceration of right kidney, initial encounter
S37.051S	Moderate laceration of right kidney, sequela
S37.052S	Moderate laceration of left kidney, sequela
S37.059D	Moderate laceration of unspecified kidney, subsequent encounter
S37.059S	Moderate laceration of unspecified kidney, sequela
S37.061S	Major laceration of right kidney, sequela
S37.062	Major laceration of left kidney
S37.062S	Major laceration of left kidney, sequela
S37.069A	Major laceration of unspecified kidney, initial encounter
S37.069S	Major laceration of unspecified kidney, sequela
H05.23	Hemorrhage of orbit
H05.231	Hemorrhage of right orbit



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H05.233	Hemorrhage of bilateral orbit
H31.302	Unspecified choroidal hemorrhage, left eye
H31.309	Unspecified choroidal hemorrhage, unspecified eye
H31.31	Expulsive choroidal hemorrhage
H31.311	Expulsive choroidal hemorrhage, right eye
H31.319	Expulsive choroidal hemorrhage, unspecified eye
H31.41	Hemorrhagic choroidal detachment
H31.412	Hemorrhagic choroidal detachment, left eye
H31.413	Hemorrhagic choroidal detachment, bilateral
H43.12	Vitreous hemorrhage, left eye
H47.02	Hemorrhage in optic nerve sheath
H47.021	Hemorrhage in optic nerve sheath, right eye
I23.0	Hemopericardium as current complication following acute myocardial infarction
I31.2	Hemopericardium, not elsewhere classified
I60	Nontraumatic subarachnoid hemorrhage
I60.02	Nontraumatic subarachnoid hemorrhage from left carotid siphon and bifurcation
I60.10	Nontraumatic subarachnoid hemorrhage from unspecified middle cerebral artery
I60.12	Nontraumatic subarachnoid hemorrhage from left middle cerebral artery
I60.2	Nontraumatic subarachnoid hemorrhage from anterior communicating artery
I60.3	Nontraumatic subarachnoid hemorrhage from posterior communicating artery
I60.30	Nontraumatic subarachnoid hemorrhage from unspecified posterior communicating artery
I60.32	Nontraumatic subarachnoid hemorrhage from left posterior communicating artery
I60.5	Nontraumatic subarachnoid hemorrhage from vertebral artery
I60.50	Nontraumatic subarachnoid hemorrhage from unspecified vertebral artery
I60.52	Nontraumatic subarachnoid hemorrhage from left vertebral artery
I60.6	Nontraumatic subarachnoid hemorrhage from other intracranial arteries
I60.9	Nontraumatic subarachnoid hemorrhage, unspecified
I61	Nontraumatic intracerebral hemorrhage
I61.1	Nontraumatic intracerebral hemorrhage in hemisphere, cortical
I61.4	Nontraumatic intracerebral hemorrhage in cerebellum
I61.9	Nontraumatic intracerebral hemorrhage, unspecified
I62.03	Nontraumatic chronic subdural hemorrhage
I62.1	Nontraumatic extradural hemorrhage
M25.00	Hemarthrosis, unspecified joint
M25.011	Hemarthrosis, right shoulder
M25.02	Hemarthrosis, elbow
M25.022	Hemarthrosis, left elbow
M25.031	Hemarthrosis, right wrist
M25.032	Hemarthrosis, left wrist
M25.04	Hemarthrosis, hand
M25.041	Hemarthrosis, right hand
M25.042	Hemarthrosis, left hand
M25.049	Hemarthrosis, unspecified hand
M25.059	Hemarthrosis, unspecified hip
M25.062	Hemarthrosis, left knee
M25.069	Hemarthrosis, unspecified knee
M25.072	Hemarthrosis, left ankle
M25.076	Hemarthrosis, unspecified foot
S06.4X0A	Epidural hemorrhage without loss of consciousness, initial encounter
S06.4X0S	Epidural hemorrhage without loss of consciousness, sequela
S06.4X1	Epidural hemorrhage with loss of consciousness of 30 minutes or less
S06.4X1D	Epidural hemorrhage with loss of consciousness of 30 minutes or less, subsequent encounter
S06.4X1S	Epidural hemorrhage with loss of consciousness of 30 minutes or less, sequela
S06.4X2	Epidural hemorrhage with loss of consciousness of 31 minutes to 59 minutes
S06.4X2A	Epidural hemorrhage with loss of consciousness of 31 minutes to 59 minutes, initial encounter
S06.4X2D	Epidural hemorrhage with loss of consciousness of 31 minutes to 59 minutes, subsequent encounter
S06.4X3D	Epidural hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, subsequent encounter
S06.4X3S	Epidural hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, sequela
S06.4X4D	Epidural hemorrhage with loss of consciousness of 6 hours to 24 hours, subsequent encounter
S06.4X4S	Epidural hemorrhage with loss of consciousness of 6 hours to 24 hours, sequela

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S06.4X5	Epidural hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level
S06.4X5A	Epidural hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, initial encounter
S06.4X6	Epidural hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving
S06.4X6A	Epidural hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, initial encounter
S06.4X6S	Epidural hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, sequela
S06.4X8	Epidural hemorrhage with loss of consciousness of any duration with death due to other causes prior to regaining consciousness
S06.4X8A	Epidural hemorrhage with loss of consciousness of any duration with death due to other causes prior to regaining consciousness, initial encounter
S06.4X9D	Epidural hemorrhage with loss of consciousness of unspecified duration, subsequent encounter
S06.4X9S	Epidural hemorrhage with loss of consciousness of unspecified duration, sequela
S06.5X0A	Traumatic subdural hemorrhage without loss of consciousness, initial encounter
S06.5X0D	Traumatic subdural hemorrhage without loss of consciousness, subsequent encounter
S06.5X0S	Traumatic subdural hemorrhage without loss of consciousness, sequela
S06.5X1	Traumatic subdural hemorrhage with loss of consciousness of 30 minutes or less
S06.5X1A	Traumatic subdural hemorrhage with loss of consciousness of 30 minutes or less, initial encounter
S06.5X1D	Traumatic subdural hemorrhage with loss of consciousness of 30 minutes or less, subsequent encounter
S06.5X1S	Traumatic subdural hemorrhage with loss of consciousness of 30 minutes or less, sequela
S06.5X2D	Traumatic subdural hemorrhage with loss of consciousness of 31 minutes to 59 minutes, subsequent encounter
S06.5X2S	Traumatic subdural hemorrhage with loss of consciousness of 31 minutes to 59 minutes, sequela
S06.5X3	Traumatic subdural hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes
S06.5X4	Traumatic subdural hemorrhage with loss of consciousness of 6 hours to 24 hours
S06.5X4A	Traumatic subdural hemorrhage with loss of consciousness of 6 hours to 24 hours, initial encounter
S06.5X4D	Traumatic subdural hemorrhage with loss of consciousness of 6 hours to 24 hours, subsequent encounter
S06.5X5D	Traumatic subdural hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, subsequent encounter
S06.5X6	Traumatic subdural hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving
S06.5X7	Traumatic subdural hemorrhage with loss of consciousness of any duration with death due to brain injury before regaining consciousness
S06.5X7A	Traumatic subdural hemorrhage with loss of consciousness of any duration with death due to brain injury before regaining consciousness, initial encounter
S06.5X8A	Traumatic subdural hemorrhage with loss of consciousness of any duration with death due to other cause before regaining consciousness, initial encounter
S06.5X9	Traumatic subdural hemorrhage with loss of consciousness of unspecified duration
S06.6	Traumatic subarachnoid hemorrhage
S06.6X0S	Traumatic subarachnoid hemorrhage without loss of consciousness, sequela
S06.6X1D	Traumatic subarachnoid hemorrhage with loss of consciousness of 30 minutes or less, subsequent encounter
S06.6X2	Traumatic subarachnoid hemorrhage with loss of consciousness of 31 minutes to 59 minutes
S06.6X2A	Traumatic subarachnoid hemorrhage with loss of consciousness of 31 minutes to 59 minutes, initial encounter
S06.6X2S	Traumatic subarachnoid hemorrhage with loss of consciousness of 31 minutes to 59 minutes, sequela
S06.6X3	Traumatic subarachnoid hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes
S06.6X3A	Traumatic subarachnoid hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, initial encounter
S06.6X3S	Traumatic subarachnoid hemorrhage with loss of consciousness of 1 hour to 5 hours 59 minutes, sequela
S06.6X4D	Traumatic subarachnoid hemorrhage with loss of consciousness of 6 hours to 24 hours, subsequent encounter
S06.6X5A	Traumatic subarachnoid hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, initial encounter
S06.6X5D	Traumatic subarachnoid hemorrhage with loss of consciousness greater than 24 hours with return to pre-existing conscious level, subsequent encounter
S06.6X6D	Traumatic subarachnoid hemorrhage with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, subsequent encounter
S06.6X7A	Traumatic subarachnoid hemorrhage with loss of consciousness of any duration with death due to brain injury prior to regaining consciousness, initial encounter
S06.6X8	Traumatic subarachnoid hemorrhage with loss of consciousness of any duration with death due to other cause prior to regaining consciousness
S06.6X9	Traumatic subarachnoid hemorrhage with loss of consciousness of unspecified duration
S06.6X9A	Traumatic subarachnoid hemorrhage with loss of consciousness of unspecified duration, initial encounter
S06.6X9D	Traumatic subarachnoid hemorrhage with loss of consciousness of unspecified duration, subsequent encounter
S26.00	Unspecified injury of heart with hemopericardium
S26.00XA	Unspecified injury of heart with hemopericardium, initial encounter
S26.00XD	Unspecified injury of heart with hemopericardium, subsequent encounter
S26.00XS	Unspecified injury of heart with hemopericardium, sequela
S26.01XD	Contusion of heart with hemopericardium, subsequent encounter
S26.01XS	Contusion of heart with hemopericardium, sequela
S26.02	Laceration of heart with hemopericardium
S26.020D	Mild laceration of heart with hemopericardium, subsequent encounter
S26.020S	Mild laceration of heart with hemopericardium, sequela
S26.021	Moderate laceration of heart with hemopericardium
S26.021A	Moderate laceration of heart with hemopericardium, initial encounter
S26.022A	Major laceration of heart with hemopericardium, initial encounter
S26.022S	Major laceration of heart with hemopericardium, sequela
S26.09XA	Other injury of heart with hemopericardium, initial encounter

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S37.011	Minor contusion of right kidney
S37.011A	Minor contusion of right kidney, initial encounter
S37.012	Minor contusion of left kidney
S37.019	Minor contusion of unspecified kidney
S37.019A	Minor contusion of unspecified kidney, initial encounter
S37.019D	Minor contusion of unspecified kidney, subsequent encounter
S37.019S	Minor contusion of unspecified kidney, sequela
S37.021A	Major contusion of right kidney, initial encounter
S37.022	Major contusion of left kidney
S37.022A	Major contusion of left kidney, initial encounter
S37.029A	Major contusion of unspecified kidney, initial encounter
S37.029D	Major contusion of unspecified kidney, subsequent encounter
S37.029S	Major contusion of unspecified kidney, sequela
S37.03	Laceration of kidney, unspecified degree
S37.031	Laceration of right kidney, unspecified degree
S37.031S	Laceration of right kidney, unspecified degree, sequela
S37.032A	Laceration of left kidney, unspecified degree, initial encounter
S37.039A	Laceration of unspecified kidney, unspecified degree, initial encounter
S37.039S	Laceration of unspecified kidney, unspecified degree, sequela
S37.042	Minor laceration of left kidney
S37.049	Minor laceration of unspecified kidney
S37.049A	Minor laceration of unspecified kidney, initial encounter
S37.049D	Minor laceration of unspecified kidney, subsequent encounter
S37.049S	Minor laceration of unspecified kidney, sequela
S37.05	Moderate laceration of kidney
S37.051D	Moderate laceration of right kidney, subsequent encounter
S37.052	Moderate laceration of left kidney
S37.052A	Moderate laceration of left kidney, initial encounter
S37.052D	Moderate laceration of left kidney, subsequent encounter
S37.059	Moderate laceration of unspecified kidney
S37.059A	Moderate laceration of unspecified kidney, initial encounter
S37.06	Major laceration of kidney
S37.061	Major laceration of right kidney
S37.061A	Major laceration of right kidney, initial encounter
S37.061D	Major laceration of right kidney, subsequent encounter
S37.062A	Major laceration of left kidney, initial encounter
S37.062D	Major laceration of left kidney, subsequent encounter
S37.069	Major laceration of unspecified kidney
S37.069D	Major laceration of unspecified kidney, subsequent encounter

The occurrence of Inpatient Confinement with the following attributes:

<b>Procedure Code (Any Confinement Position) AND</b>	is any of: { "30 30 ", "30 30 ", "30 30 ", "30 30 ", "30 30 ", "30 30V ", "30 30 ", "30 33 ", "30 33 ", "30 33 ", "30 33 ", "30 40 ", "30 40 ", "30 40 ", "30 40 ", "30 43L ", "30 43 ", "30 43 ", "30 43 ", "30 43 ", "30 43 ", "30 43 ", "30 43 ", "30 43 ", "30 43 ", "30 43 ", "30 43V " }
D50.0	Iron deficiency anemia secondary to blood loss (chronic)
D62	Acute posthemorrhagic anemia
I85.11	Secondary esophageal varices with bleeding
K20	Esophagitis
K20.0	Eosinophilic esophagitis
K20.8	Other esophagitis
K20.9	Esophagitis, unspecified
K21.0	Gastro-esophageal reflux disease with esophagitis
K22.11	Ulcer of esophagus with bleeding
K25.1	Acute gastric ulcer with perforation
K25.2	Acute gastric ulcer with both hemorrhage and perforation
K25.4	Chronic or unspecified gastric ulcer with hemorrhage
K25.5	Chronic or unspecified gastric ulcer with perforation

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K26.2	Acute duodenal ulcer with both hemorrhage and perforation
K26.4	Chronic or unspecified duodenal ulcer with hemorrhage
K26.6	Chronic or unspecified duodenal ulcer with both hemorrhage and perforation
K27.4	Chronic or unspecified peptic ulcer, site unspecified, with hemorrhage
K27.5	Chronic or unspecified peptic ulcer, site unspecified, with perforation
K27.6	Chronic or unspecified peptic ulcer, site unspecified, with both hemorrhage and perforation
K28.1	Acute gastrojejunal ulcer with perforation
K28.2	Acute gastrojejunal ulcer with both hemorrhage and perforation
K29.31	Chronic superficial gastritis with bleeding
K29.91	Gastroduodenitis, unspecified, with bleeding
K57.11	Diverticulosis of small intestine without perforation or abscess with bleeding
K57.21	Diverticulitis of large intestine with perforation and abscess with bleeding
K57.51	Diverticulosis of both small and large intestine without perforation or abscess with bleeding
K57.53	Diverticulitis of both small and large intestine without perforation or abscess with bleeding
K57.93	Diverticulitis of intestine, part unspecified, without perforation or abscess with bleeding
K62.5	Hemorrhage of anus and rectum
K64.1	Second degree hemorrhoids
K64.3	Fourth degree hemorrhoids
K64.9	Unspecified hemorrhoids
K92.0	Hematemesis
K92.1	Melena
N89.7	Hematocolpos
N92.1	Excessive and frequent menstruation with irregular cycle
N93.8	Other specified abnormal uterine and vaginal bleeding
R04.0	Epistaxis
R31.0	Gross hematuria
R31.9	Hematuria, unspecified
R58	Hemorrhage, not elsewhere classified
I85.01	Esophageal varices with bleeding
K22.6	Gastro-esophageal laceration-hemorrhage syndrome
K25.0	Acute gastric ulcer with hemorrhage
K25.6	Chronic or unspecified gastric ulcer with both hemorrhage and perforation
K26.0	Acute duodenal ulcer with hemorrhage
K26.1	Acute duodenal ulcer with perforation
K26.5	Chronic or unspecified duodenal ulcer with perforation
K27.0	Acute peptic ulcer, site unspecified, with hemorrhage
K27.1	Acute peptic ulcer, site unspecified, with perforation
K27.2	Acute peptic ulcer, site unspecified, with both hemorrhage and perforation
K28.0	Acute gastrojejunal ulcer with hemorrhage
K28.4	Chronic or unspecified gastrojejunal ulcer with hemorrhage
K28.5	Chronic or unspecified gastrojejunal ulcer with perforation
K28.6	Chronic or unspecified gastrojejunal ulcer with both hemorrhage and perforation
K29.01	Acute gastritis with bleeding
K29.21	Alcoholic gastritis with bleeding
K29.41	Chronic atrophic gastritis with bleeding
K29.51	Unspecified chronic gastritis with bleeding
K29.61	Other gastritis with bleeding
K29.71	Gastritis, unspecified, with bleeding
K29.81	Duodenitis with bleeding
K31.811	Angiodysplasia of stomach and duodenum with bleeding
K55.21	Angiodysplasia of colon with hemorrhage
K57.01	Diverticulitis of small intestine with perforation and abscess with bleeding
K57.31	Diverticulosis of large intestine without perforation or abscess with bleeding
K57.41	Diverticulitis of both small and large intestine with perforation and abscess with bleeding
K57.81	Diverticulitis of intestine, part unspecified, with perforation and abscess with bleeding
K57.91	Diverticulosis of intestine, part unspecified, without perforation or abscess with bleeding
K64.0	First degree hemorrhoids
K64.2	Third degree hemorrhoids
K64.4	Residual hemorrhoidal skin tags
K64.5	Perianal venous thrombosis

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K64.8	Other hemorrhoids
K92.2	Gastrointestinal hemorrhage, unspecified
N89.8	Other specified noninflammatory disorders of vagina
N93.9	Abnormal uterine and vaginal bleeding, unspecified
R04.1	Hemorrhage from throat
R04.2	Hemoptysis

# Appendix A

## Inpatient, Any Diagnosis: ICD-9 Codes

280.0 - IRON DEFICIENCY ANEMIA SECONDARY TO BLOOD LOSS (CHRONIC)  
455.7 - UNSPECIFIED THROMBOSED HEMORRHOIDS  
459.0 - HEMORRHAGE UNSPECIFIED  
530.10 - ESOPHAGITIS UNSPECIFIED  
530.13 - EOSINOPHILIC ESOPHAGITIS  
531.0 - ACUTE GASTRIC ULCER WITH HEMORRHAGE  
531.1 - ACUTE GASTRIC ULCER WITH PERFORATION  
531.2 - ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION  
531.20 - ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION  
531.3 - ACUTE GASTRIC ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
531.4 - CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE  
531.6 - CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION  
531.61 - CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION  
531.9 - GASTRIC ULCER UNSPECIFIED AS ACUTE OR CHRONIC WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
532.0 - ACUTE DUODENAL ULCER WITH HEMORRHAGE  
532.00 - ACUTE DUODENAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION  
532.01 - ACUTE DUODENAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION  
532.2 - ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION  
532.20 - ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION  
532.3 - ACUTE DUODENAL ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
532.4 - CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE  
532.41 - CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION  
532.5 - CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH PERFORATION  
532.61 - CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION  
533.0 - ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE  
533.00 - ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITHOUT OBSTRUCTION  
533.01 - ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITH OBSTRUCTION  
533.1 - ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH PERFORATION  
533.2 - ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION  
533.20 - ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION  
533.3 - ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITHOUT MENTION OF HEMORRHAGE AND PERFORATION  
533.6 - CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION  
533.60 - CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION  
533.7 - CHRONIC PEPTIC ULCER OF UNSPECIFIED SITE WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
534.00 - ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION  
534.01 - ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION  
534.20 - ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION  
534.3 - ACUTE GASTROJEJUNAL ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
534.40 - CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION  
534.41 - CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION  
534.61 - CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION  
534.7 - CHRONIC GASTROJEJUNAL ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
534.9 - GASTROJEJUNAL ULCER UNSPECIFIED AS ACUTE OR CHRONIC WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
535.00 - ACUTE GASTRITIS (WITHOUT HEMORRHAGE)  
535.01 - ACUTE GASTRITIS WITH HEMORRHAGE  
535.10 - ATROPHIC GASTRITIS (WITHOUT HEMORRHAGE)  
535.20 - GASTRIC MUCOSAL HYPERTROPHY (WITHOUT HEMORRHAGE)

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535.21 - GASTRIC MUCOSAL HYPERTROPHY WITH HEMORRHAGE  
535.31 - ALCOHOLIC GASTRITIS WITH HEMORRHAGE  
535.40 - OTHER SPECIFIED GASTRITIS (WITHOUT HEMORRHAGE)  
535.41 - OTHER SPECIFIED GASTRITIS WITH HEMORRHAGE  
562.00 - DIVERTICULOSIS OF SMALL INTESTINE (WITHOUT HEMORRHAGE)  
562.01 - DIVERTICULITIS OF SMALL INTESTINE (WITHOUT HEMORRHAGE)  
562.03 - DIVERTICULITIS OF SMALL INTESTINE WITH HEMORRHAGE  
562.11 - DIVERTICULITIS OF COLON (WITHOUT HEMORRHAGE)  
562.13 - DIVERTICULITIS OF COLON WITH HEMORRHAGE  
569.85 - ANGIODYSPLASIA OF INTESTINE WITH HEMORRHAGE  
578.0 - HEMATEMESIS  
578.1 - BLOOD IN STOOL  
578.9 - HEMORRHAGE OF GASTROINTESTINAL TRACT UNSPECIFIED  
593.81 - VASCULAR DISORDERS OF KIDNEY  
599.70 - HEMATURIA UNSPECIFIED  
599.71 - GROSS HEMATURIA  
623.6 - VAGINAL HEMATOMA  
626.6 - METRORRHAGIA  
784.7 - EPISTAXIS  
784.8 - HEMORRHAGE FROM THROAT  
786.31 - ACUTE IDIOPATHIC PULMONARY HEMORRHAGE IN INFANTS  
285.1 - ACUTE POSTHEMORRHAGIC ANEMIA  
455.1 - INTERNAL THROMBOSED HEMORRHOIDS  
455.2 - INTERNAL HEMORRHOIDS WITH OTHER COMPLICATION  
455.4 - EXTERNAL THROMBOSED HEMORRHOIDS  
455.5 - EXTERNAL HEMORRHOIDS WITH OTHER COMPLICATION  
455.6 - UNSPECIFIED HEMORRHOIDS WITHOUT COMPLICATION  
455.8 - UNSPECIFIED HEMORRHOIDS WITH OTHER COMPLICATION  
455.9 - RESIDUAL HEMORRHOIDAL SKIN TAGS  
456.0 - ESOPHAGEAL VARICES WITH BLEEDING  
456.20 - ESOPHAGEAL VARICES IN DISEASES CLASSIFIED ELSEWHERE WITH BLEEDING  
530.1 - ESOPHAGITIS  
530.11 - REFLUX ESOPHAGITIS  
530.12 - ACUTE ESOPHAGITIS  
530.19 - OTHER ESOPHAGITIS  
530.7 - GASTROESOPHAGEAL LACERATION-HEMORRHAGE SYNDROME  
530.82 - ESOPHAGEAL HEMORRHAGE  
531.00 - ACUTE GASTRIC ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION  
531.01 - ACUTE GASTRIC ULCER WITH HEMORRHAGE WITH OBSTRUCTION  
531.21 - ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION  
531.40 - CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION  
531.41 - CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE WITH OBSTRUCTION  
531.5 - CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH PERFORATION  
531.60 - CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION  
531.7 - CHRONIC GASTRIC ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
532.1 - ACUTE DUODENAL ULCER WITH PERFORATION  
532.21 - ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION  
532.40 - CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION

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532.6 - CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION  
532.60 - CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION  
532.7 - CHRONIC DUODENAL ULCER WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
532.9 - DUODENAL ULCER UNSPECIFIED AS ACUTE OR CHRONIC WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
533.21 - ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION  
533.4 - CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE  
533.40 - CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITHOUT OBSTRUCTION  
533.41 - CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITH OBSTRUCTION  
533.5 - CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH PERFORATION  
533.61 - CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION  
533.9 - PEPTIC ULCER OF UNSPECIFIED SITE UNSPECIFIED AS ACUTE OR CHRONIC WITHOUT MENTION OF HEMORRHAGE OR PERFORATION  
534.0 - ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE  
534.1 - ACUTE GASTROJEJUNAL ULCER WITH PERFORATION  
534.2 - ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION  
534.21 - ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION  
534.4 - CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE  
534.5 - CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH PERFORATION  
534.6 - CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION  
534.60 - CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION  
535.11 - ATROPHIC GASTRITIS WITH HEMORRHAGE  
535.30 - ALCOHOLIC GASTRITIS (WITHOUT HEMORRHAGE)  
535.50 - UNSPECIFIED GASTRITIS AND GASTRODUODENITIS (WITHOUT HEMORRHAGE)  
535.51 - UNSPECIFIED GASTRITIS AND GASTRODUODENITIS WITH HEMORRHAGE  
535.60 - DUODENITIS (WITHOUT HEMORRHAGE)  
535.61 - DUODENITIS WITH HEMORRHAGE  
537.83 - ANGIODYSPLASIA OF STOMACH AND DUODENUM WITH HEMORRHAGE  
562.02 - DIVERTICULOSIS OF SMALL INTESTINE WITH HEMORRHAGE  
562.10 - DIVERTICULOSIS OF COLON (WITHOUT HEMORRHAGE)  
562.12 - DIVERTICULOSIS OF COLON WITH HEMORRHAGE  
569.3 - HEMORRHAGE OF RECTUM AND ANUS  
623.8 - OTHER SPECIFIED NONINFLAMMATORY DISORDERS OF VAGINA  
626.8 - OTHER DISORDERS OF MENSTRUATION AND OTHER ABNORMAL BLEEDING FROM FEMALE GENITAL TRACT  
786.3 - HEMOPTYSIS  
786.30 - HEMOPTYSIS UNSPECIFIED  
786.39 - OTHER HEMOPTYSIS  
285.9 - ANEMIA UNSPECIFIED  
790.92 - ABNORMAL COAGULATION PROFILE  
363.63 - CHOROIDAL RUPTURE  
626.2 - EXCESSIVE OR FREQUENT MENSTRUATION  
372.72 - CONJUNCTIVAL HEMORRHAGE

### Inpatient, Any Diagnosis: ICD-10 Codes

D50.0 - Iron deficiency anemia secondary to blood loss (chronic)  
D62 - Acute posthemorrhagic anemia  
I85.01 - Esophageal varices with bleeding  
I85.11 - Secondary esophageal varices with bleeding  
K20.0 - Eosinophilic esophagitis  
K20.8 - Other esophagitis



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K22.11 - Ulcer of esophagus with bleeding  
K22.6 - Gastro-esophageal laceration-hemorrhage syndrome  
K25.0 - Acute gastric ulcer with hemorrhage  
K25.1 - Acute gastric ulcer with perforation  
K25.2 - Acute gastric ulcer with both hemorrhage and perforation  
K25.4 - Chronic or unspecified gastric ulcer with hemorrhage  
K25.5 - Chronic or unspecified gastric ulcer with perforation  
K26.1 - Acute duodenal ulcer with perforation  
K26.2 - Acute duodenal ulcer with both hemorrhage and perforation  
K26.4 - Chronic or unspecified duodenal ulcer with hemorrhage  
K27.1 - Acute peptic ulcer, site unspecified, with perforation  
K27.2 - Acute peptic ulcer, site unspecified, with both hemorrhage and perforation  
K27.5 - Chronic or unspecified peptic ulcer, site unspecified, with perforation  
K27.6 - Chronic or unspecified peptic ulcer, site unspecified, with both hemorrhage and perforation  
K28.0 - Acute gastrojejunal ulcer with hemorrhage  
K28.4 - Chronic or unspecified gastrojejunal ulcer with hemorrhage  
K28.6 - Chronic or unspecified gastrojejunal ulcer with both hemorrhage and perforation  
K29.01 - Acute gastritis with bleeding  
K29.31 - Chronic superficial gastritis with bleeding  
K29.41 - Chronic atrophic gastritis with bleeding  
K29.51 - Unspecified chronic gastritis with bleeding  
K29.71 - Gastritis, unspecified, with bleeding  
K57.11 - Diverticulosis of small intestine without perforation or abscess with bleeding  
K57.21 - Diverticulitis of large intestine with perforation and abscess with bleeding  
K57.41 - Diverticulitis of both small and large intestine with perforation and abscess with bleeding  
K57.51 - Diverticulosis of both small and large intestine without perforation or abscess with bleeding  
K57.81 - Diverticulitis of intestine, part unspecified, with perforation and abscess with bleeding  
K57.91 - Diverticulosis of intestine, part unspecified, without perforation or abscess with bleeding  
K57.93 - Diverticulitis of intestine, part unspecified, without perforation or abscess with bleeding  
K62.5 - Hemorrhage of anus and rectum  
K64.0 - First degree hemorrhoids  
K64.5 - Perianal venous thrombosis  
K64.8 - Other hemorrhoids  
K64.9 - Unspecified hemorrhoids  
K92.0 - Hematemesis  
K92.2 - Gastrointestinal hemorrhage, unspecified  
N89.7 - Hematocolpos  
N93.8 - Other specified abnormal uterine and vaginal bleeding  
R04.2 - Hemoptysis  
R31.0 - Gross hematuria  
K20 - Esophagitis  
K20.9 - Esophagitis, unspecified  
K21.0 - Gastro-esophageal reflux disease with esophagitis  
K25.6 - Chronic or unspecified gastric ulcer with both hemorrhage and perforation  
K26.0 - Acute duodenal ulcer with hemorrhage  
K26.5 - Chronic or unspecified duodenal ulcer with perforation  
K26.6 - Chronic or unspecified duodenal ulcer with both hemorrhage and perforation  
K27.0 - Acute peptic ulcer, site unspecified, with hemorrhage

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K27.4 - Chronic or unspecified peptic ulcer, site unspecified, with hemorrhage  
K28.1 - Acute gastrojejunal ulcer with perforation  
K28.2 - Acute gastrojejunal ulcer with both hemorrhage and perforation  
K28.5 - Chronic or unspecified gastrojejunal ulcer with perforation  
K29.21 - Alcoholic gastritis with bleeding  
K29.61 - Other gastritis with bleeding  
K29.81 - Duodenitis with bleeding  
K29.91 - Gastroduodenitis, unspecified, with bleeding  
K31.811 - Angiodysplasia of stomach and duodenum with bleeding  
K55.21 - Angiodysplasia of colon with hemorrhage  
K57.01 - Diverticulitis of small intestine with perforation and abscess with bleeding  
K57.31 - Diverticulosis of large intestine without perforation or abscess with bleeding  
K57.53 - Diverticulitis of both small and large intestine without perforation or abscess with bleeding  
K64.1 - Second degree hemorrhoids  
K64.2 - Third degree hemorrhoids  
K64.3 - Fourth degree hemorrhoids  
K64.4 - Residual hemorrhoidal skin tags  
K92.1 - Melena  
N89.8 - Other specified noninflammatory disorders of vagina  
N93.9 - Abnormal uterine and vaginal bleeding, unspecified  
R04.0 - Epistaxis  
R04.1 - Hemorrhage from throat  
R58 - Hemorrhage, not elsewhere classified  
D64.9 - Anemia, unspecified  
R79.1 - Abnormal coagulation profile  
H11.30 - Conjunctival hemorrhage, unspecified eye  
H11.31 - Conjunctival hemorrhage, right eye  
H11.32 - Conjunctival hemorrhage, left eye  
H11.33 - Conjunctival hemorrhage, bilateral  
H31.321 - Choroidal rupture, right eye  
H31.322 - Choroidal rupture, left eye  
H31.323 - Choroidal rupture, bilateral  
H31.329 - Choroidal rupture, unspecified eye  
N92.1 - Excessive and frequent menstruation with irregular cycle  
R31.1 - Benign essential microscopic hematuria  
R31.2 - Other microscopic hematuria  
R31.29 - Other microscopic hematuria  
N92.0 - Excessive and frequent menstruation with regular cycle  
R31.21 - Asymptomatic microscopic hematuria  
R31.9 - Hematuria, unspecified

# Appendix A

## Procedure Codes Description

### CPT-4 codes

1960	Anesthesia for vaginal delivery only
1961	Anesthesia for cesarean delivery only
1962	Anesthesia for urgent hysterectomy following delivery
1963	Anesthesia for cesarean hysterectomy w/o any labor analgesia/anesthesia care
1967	Neuraxial labor analgesia/anesthesia, planned vaginal delivery
1968	Anesthesia for cesarean delivery following neuraxial labor analgesia/anesthesia
1969	Anes for cesarean hysterectomy following neuraxial labor analgesia/anesthesia
59050	Fetal monitoring in labor, physician w/written report; s & i
59051	Fetal monitoring in labor, physician w/written report; interpretation only
59400	ROUTINE TOTAL OBSTETRIC CARE including antepartum care, vaginal delivery (with or without episiotomy, and/or forceps) and postpartum care.
59409	Vaginal delivery only (w/wo episiotomy &/or forceps)
59410	Vaginal delivery only (w/wo episiotomy &/or forceps); w/postpartum care
59412	Ext cephalic version, w/wo tocolysis
59414	Delivery of placenta (separate proc)
59430	Postpartum care only
59510	Routine obstetric care w/antepartum care, cesarean delivery, & postpartum care
59514	Cesarean delivery only
59515	Cesarean delivery only; w/postpartum care
59525	Subtotal/total hysterectomy after cesarean delivery
59610	Routine obstetric care including antepartum care, vaginal delivery (with or without episiotomy, and/or forceps) and postpartum care, after previous cesarean delivery
59612	Vaginal delivery only, after previous cesarean delivery (with or without episiotomy and/or forceps)
59614	Vaginal delivery only, previous cesarean delivery w/postpartum care
59618	Routine obstetric care including antepartum care, cesarean delivery, and postpartum care, following attempted vaginal delivery after previous cesarean delivery
59620	Cesarean delivery after failed vaginal delivery, previous cesarean delivery
59622	Cesarean delivery after failed vaginal delivery, previous cesarean delivery; w/postpartum care
99436	Attendance at delivery, at request of delivering physician, & stabilization of newborn
99440	Newborn resuscitation

### ICD-9 procedure codes

72.xx	Forceps, vacuum, & breech
73.xx	Other including manual delivery
74xx	Cesarean section
75.4x	Manual removal of placenta

### ICD-10 procedure codes

#### Normal Delivery

10E0X22	Delivery of Products of Conception, External Approach
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#### C-Section

10D0020	Extraction of Products of Conception, High, Open Approach
10D0021	Extraction of Products of Conception, Low, Open Approach
10D0022	Extraction of Products of Conception, Extraperitoneal, Open Approach

#### Other assisted delivery (forceps, vacuum, internal version, other)

10D0723	Extraction of Products of Conception, Low Forceps, Via Natural or Artificial Opening
10D0724	Extraction of Products of Conception, Mid Forceps, Via Natural or Artificial Opening
10D0725	Extraction of Products of Conception, High Forceps, Via Natural or Artificial Opening
10D0726	Extraction of Products of Conception, Vacuum, Via Natural or Artificial Opening
10D0727	Extraction of Products of Conception, Internal Version, Via Natural or Artificial Opening
10D0728	Extraction of Products of Conception, Other, Via Natural or Artificial Opening

ICD-9 code	Definition	Gestational Age	
		Weeks	Days
765.21	Less than 24 c24		168
765.22	24 completed weeks of gestation		
765.23	25-26 comple 26		182
765.24	27-28 comple 28		196
765.25	29-30 comple 30		210
765.26	31-32 comple 32		224
765.27	33-34 comple 34		238
765.28	35-36 comple 36		252

ICD-10 code	Definition	Gestational Age
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# Appendix A

		Weeks	Days
P07.21	Extreme imm	23	161
P07.22	Extreme imm	23	161
P07.23	Extreme imm	24	168
P07.24	Extreme imm	25	175
P07.25	Extreme imm	26	182
P07.26	Extreme imm	27	189
P07.31	Preterm new	28	196
P07.32	Preterm new	29	203
P07.33	Preterm new	30	210
P07.34	Preterm new	31	217
P07.35	Preterm new	32	224
P07.36	Preterm new	33	231
P07.37	Preterm new	34	238
P07.38	Preterm new	35	245
P07.39	Preterm new	36	252

## Codes indicating extreme prematurity

ICD-9 code	Definition	Gestational Age	
		Weeks	Days
765.0	Disorders rela	28	196
765.00	Extreme immaturity, unspecified [weight]		
765.01	Extreme immaturity, less than 500 grams		
765.02	Extreme immaturity, 500-749 grams		
765.03	Extreme immaturity, 750-999 grams		
765.04	Extreme immaturity, 1,000-1,249 grams		
765.05	Extreme immaturity, 1,250-1,499 grams		
765.06	Extreme immaturity, 1,500-1,749 grams		
765.07	Extreme immaturity, 1,750-1,999 grams		
765.08	Extreme immaturity, 2,000-2,499 grams		

ICD-10 code	Definition	Gestational Age	
		Weeks	Days
P07.2	Extreme imm	28	196
P07.20	Extreme immaturity of newborn, unspecified weeks of gestation		
O42.012	Preterm premature rupture of membranes, onset of labor within 24 hours of rupture, second trimester		

## Other preterm codes

ICD-9 code	Definition	Gestational Age	
		Weeks	Days
765.1	Disorders rela	35	245
765.10	Other preterm infants, unspecified [weight]		
765.11	Other preterm infants, less than 500 grams		
765.12	Other preterm infants, 500-749 grams		
765.13	Other preterm infants, 750-999 grams		
765.14	Other preterm infants, 1,000-1,249 grams		
765.15	Other preterm infants, 1,250-1,499 grams		
765.16	Other preterm infants, 1,500-1,749 grams		
765.17	Other preterm infants, 1,750-1,999 grams		
765.18	Other preterm infants, 2,000-2,499 grams		
644.21	Onset of delivery before 37 completed weeks of gestation		

ICD-10 code	Definition	Gestational Age	
		Weeks	Days
P05.01	Disorders of n	35	245
P05.02	Disorders of newborn related to slow fetal growth and fetal malnutrition, 500-749 grams		
P05.03	Disorders of newborn related to slow fetal growth and fetal malnutrition, 750-999 grams		
P05.04	Disorders of newborn related to slow fetal growth and fetal malnutrition, 1000-1249 grams		
P05.05	Disorders of newborn related to slow fetal growth and fetal malnutrition, 1250-1499 grams		
P05.06	Disorders of newborn related to slow fetal growth and fetal malnutrition, 1500-1749 grams		
P05.07	Disorders of newborn related to slow fetal growth and fetal malnutrition, 1750-1999 grams		
P05.11	Newborn small for gestational age, less than 500 grams		
P05.12	Newborn small for gestational age, 500-749 grams		
P05.13	Newborn small for gestational age, 750-999 grams		
P05.14	Newborn small for gestational age, 1000-1249 grams		

# Appendix A

P05.15	Newborn small for gestational age, 1250-1499 grams
P05.16	Newborn small for gestational age, 1500-1749 grams
P05.17	Newborn small for gestational age, 1750-1999 grams
P07.0	Extremely low birth weight newborn
P07.00	Extremely low birth weight newborn, unspecified weight
P07.01	Extremely low birth weight newborn, less than 500 grams
P07.02	Extremely low birth weight newborn, 500-749 grams
P07.03	Extremely low birth weight newborn, 750-999 grams
P07.1	Other low birth weight newborn
P07.10	Other low birth weight newborn, unspecified weight
P07.14	Other low birth weight newborn,1000-1249 grams
P07.15	Other low birth weight newborn,1250-1499 grams
P07.16	Other low birth weight newborn,1500-1749 grams
P07.17	Other low birth weight newborn,1750-1999 grams
P07.3	Preterm [premature] newborn [other]
P07.30	Preterm newborn, unspecified weeks of gestation
O60.1	Preterm labor with preterm delivery
O42.01	Preterm premature rupture of membranes, onset of labor within 24 hours of rupture
O42.019	Preterm premature rupture of membranes, onset of labor within 24 hours of rupture, unspecified trimester
O42.013	Preterm premature rupture of membranes, onset of labor within 24 hours of rupture, third trimester
644.2	early onset of delivery
644.20	Early onset of delivery, unspecified as to episode of care or not applicable
644.21	Early onset of delivery, delivered, with or without mention of antepartum condition
776.6	anemia of prematurity
362.20	retinopathy of prematurity, unspecified
362.22	retinopathy of prematurity, stage 0
362.23	retinopathy of prematurity, stage 1
362.24	retinopathy of prematurity, stage 2
362.25	retinopathy of prematurity, stage 3
362.26	retinopathy of prematurity, stage 4
362.27	retinopathy of prematurity, stage 5
<b>CPT</b>	
49491	repair, initial inguinal hernia, preterm infant (younger than 37 weeks gestation at birth), performed from birth up to 50 weeks postconception
49492	repair, initial inguinal hernia, preterm infant (younger than 37 weeks gestation at birth), performed from birth up to 50 weeks postconception
67229	treatment of extensive or progressive retinopathy, 1 or more sessions; preterm infant (less than 37 weeks gestation at birth), performed from
836	anesthesia for hernia repairs in the lower abdomen not otherwise specified, infants younger than 37 weeks gestational age at birth

## ICD-10 code Definition

H35.1	Retinopathy of prematurity
P61.2	Anemia of prematurity
V27.2	Twins both liveborn
V27.3	Mother with twins one liveborn and one stillborn
V27.4	Mother with twins both stillborn
V27.5	Other multiple birth, all liveborn
V27.6	Other multiple birth, some liveborn
V31	Twin, mate liveborn
V32	Twin birth mate stillborn
V33	Twin, unspecified
V34	Other multiple, mates all liveborn
V35	Other multiple birth (three or more) mates all stillborn
V36	Other multiple, mates live- and stillborn
V37	Other multiple, unspecified
651	Multiple gestation
651.0 x	Twin Pregnancy
651.1 x	Triplet pregnancy
651.2 x	Quadruplet pregnancy
651.3 x	Twin pregnancy with fetal loss and retention of one fetus
651.4 x	Triplet pregnancy with fetal loss and retention of one or more fetus(es)
651.5 x	Quadruplet pregnancy with fetal loss and retention of one or more fetus(es)
651.6 x	Other multiple pregnancy with fetal loss and retention of one or more fetus(es)
651.7 x	Multiple gestation following (elective) fetal reduction
651.8 x	Other specified multiple gestation
651.9 x	Unspecified multiple gestation

# Appendix A

652.6x	Multiple gestation with malpresentation of one fetus or more
660.5x	Locked Twins
662.3x	Delayed delivery of second twin, triplet, etc.
761.5x	Multiple pregnancy

ICD10 Code	Description
030xxxx	Multiple gestation
031xxxx	Complications specific to multiple gestation
043.02	Fetus-to-fetus placental transfusion syndrome
063.2	Delayed delivery of second twin, triplet, etc.
237.2	Twins, both liveborn
237.3	Twins, one liveborn and one stillborn
237.5	Other multiple births, all liveborn
237.50	Multiple births, unspecified, all liveborn
237.51	Triplets, all liveborn
237.52	Quadruplets, all liveborn
237.53	Quintuplets, all liveborn
237.54	Sextuplets, all liveborn
237.59	Other multiple births, all liveborn
237.6	Other multiple births, some liveborn
237.60	Multiple births, unspecified, some liveborn
237.61	Triplets, some liveborn
237.62	Quadruplets, some liveborn
237.63	Quintuplets, some liveborn
237.64	Sextuplets, some liveborn
237.69	Other multiple births, some liveborn
238.3	Twin liveborn infant, born in hospital
238.30	Twin liveborn infant, delivered vaginally
238.31	Twin liveborn infant, delivered by cesarean
238.4	Twin liveborn infant, born outside hospital
238.5	Twin liveborn infant, unspecified as to place of birth
238.6	Other multiple liveborn infant, born in hospital
238.61	Triplet liveborn infant, delivered vaginally
238.62	Triplet liveborn infant, delivered by cesarean
238.63	Quadruplet liveborn infant, delivered vaginally
238.64	Quadruplet liveborn infant, delivered by cesarean
238.65	Quintuplet liveborn infant, delivered vaginally
238.66	Quintuplet liveborn infant, delivered by cesarean
238.68	Other multiple liveborn infant, delivered vaginally
238.69	Other multiple liveborn infant, delivered by cesarean
238.7	Other multiple liveborn infant, born outside hospital
238.8	Other multiple liveborn infant, unspecified as to place of birth
P01.5	Newborn affected by multiple pregnancy
645	Late Pregnancy
645.1	Post term pregnancy
645.10	Post term pregnancy, unspecified as to episode of care or not applicable
645.11	Post term pregnancy, delivered, with or without mention of antepartum condition
645.13	Post term pregnancy, antepartum condition or complication
645.2	Prolonged pregnancy
645.20	Prolonged pregnancy, unspecified as to episode of care or not applicable
645.21	Prolonged pregnancy, delivered, with or without mention of antepartum condition
645.23	Prolonged pregnancy, antepartum condition or complication
766.2	Late infant, not 'heavy-for-dates'
766.21	Post-term infant
766.22	Prolonged gestation of infant
048	Late pregnancy
048.0	Post-term pregnancy
048.1	Prolonged pregnancy
P08.2	Late newborn, not heavy for gestational age
P08.21	Post-term newborn
P08.22	Prolonged gestation of newborn
23A.41	41 weeks gestation of pregnancy
23A.42	42 weeks gestation of pregnancy

# Appendix A

23A.49 Greater than 42 weeks gestation of pregnancy

## ICD-10 CODES

### INDICATING

### PREGNANCY

#### Dx codes:

009.XY2 Supervision of high risk pregnancy (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O10 Pre-existing hypertension complicating pregnancy, childbirth and the puerperium (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O11 Pre-existing hypertension with pre-eclampsia (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O12 Gestational [pregnancy-induced] edema and proteinuria without hypertension (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O13 Gestational [pregnancy-induced] hypertension without significant proteinuria (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O14 Pre-eclampsia (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O15 Eclampsia (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O16 Unspecified maternal hypertension (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O20 Hemorrhage in early pregnancy  
O21 Excessive vomiting in pregnancy (last digit refers to first/second/third/unspecified trimester)  
O22 Venous complications and hemorrhoids in pregnancy  
O23 Infections of genitourinary tract in pregnancy (last digit refers to first/second/third/unspecified trimester)  
O24 Diabetes mellitus in pregnancy, childbirth, and the puerperium (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O25 Malnutrition in pregnancy, childbirth and the puerperium (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O26 Maternal care for other conditions predominantly related to pregnancy (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O28 Abnormal findings on antenatal screening of mother  
O29 Complications of anesthesia during pregnancy (last digit refers to first/second/third/unspecified trimester)  
O30 Multiple gestation (last digit refers to first/second/third/unspecified trimester)  
O31 Complications specific to multiple gestation (certain digit refers to first/second/third/unspecified trimester)  
O32 Maternal care for malpresentation of fetus  
O33 Maternal care for disproportion  
O34 Maternal care for abnormality of pelvic organs (most codes indicate first/second/third/unspecified trimester)  
O35 Maternal care for known or suspected fetal abnormality and damage  
O36 Maternal care for other fetal problems (codes indicate first/second/third/unspecified trimester)  
O40 Polyhydramnios (codes indicate first/second/third/unspecified trimester)  
O41 Other disorders of amniotic fluid and membranes (codes indicate first/second/third/unspecified trimester)  
O42.1 Premature rupture of membranes, onset of labor more than 24 hours following rupture  
O42.9 Premature rupture of membranes, unspecified as to length of time between rupture and onset of labor  
O43 Placental disorders (last digit refers to first/second/third/unspecified trimester)  
O44 Placenta previa (last digit refers to first/second/third/unspecified trimester)  
O45 Premature separation of placenta (last digit refers to first/second/third/unspecified trimester)  
O46 Antepartum hemorrhage, not elsewhere classified (last digit refers to first/second/third/unspecified trimester)  
O47 False labor  
O60.0 Preterm labor without delivery  
O61 Failed induction of labor  
O71.0 Rupture of uterus (spontaneous) before onset of labor  
O72 Postpartum hemorrhage  
72.2 Delayed and secondary postpartum hemorrhage  
72.3 Postpartum coagulation defects  
O73 Retained placenta and membranes, without hemorrhage  
O75 Other complications of labor and delivery, not elsewhere classified  
O94 Sequelae of complication of pregnancy, childbirth, and the puerperium  
O98 Maternal infectious and parasitic diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates first trimester, second trimester, third trimester, unspecified, or nothing)  
O99 Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates first trimester, second trimester, third trimester, unspecified, or nothing)  
O9A Maternal malignant neoplasms, traumatic in uries and abuse classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates first trimester, second trimester, third trimester, unspecified, or nothing)  
232.01 Encounter for pregnancy test - result positive  
233 Pregnant state  
234 Encounter for supervision of normal pregnancy  
236 Encounter for antenatal screening of mother  
239 Encounter for maternal postpartum care and examination  
239.1 Encounter for care and examination of lactating mother  
239.2 Encounter for routine postpartum follow-up

#### 23A Weeks of gestation

#### Proc codes:

102 Change  
109 Drainage  
10H Insertion  
10J Inspection  
10P Removal  
10Q Repair

# Appendix A

10S Reposition

10Y Transplantation

**ICD-10 CODES INDICATING DELIVERY (diagnostic codes that were not considered in the algorithm to identify deliveries)**

**Dx codes:**

Use the following codes only if the last digit indicates childbirth or puerperium or labor

O10 Pre-existing hypertension complicating pregnancy, childbirth and the puerperium

O11 Pre-existing hypertension with pre-eclampsia

O12 Gestational [pregnancy-induced] edema and proteinuria without hypertension

O13 Gestational [pregnancy-induced] hypertension without significant proteinuria

O14 Pre-eclampsia

O15 Eclampsia

O16 Unspecified maternal hypertension

O24 Diabetes mellitus in pregnancy, childbirth, and the puerperium

O25 Malnutrition in pregnancy, childbirth and the puerperium

O26 Maternal care for other conditions predominantly related to pregnancy

O42.0 Premature rupture of membranes, onset of labor within 24 hours of rupture, except O42.011 (first trimester)

O48 Late pregnancy

O60.1 Preterm labor with preterm delivery

O60.2 Term delivery with preterm labor

O62 Abnormalities of forces of labor

O63 Long labor

O64 Obstructed labor due to malposition and malpresentation of fetus

O65 Obstructed labor due to maternal pelvic abnormality

O66 Other obstructed labor

O67 Labor and delivery complicated by intrapartum hemorrhage, not elsewhere classified

O68 Labor and delivery complicated by abnormality of fetal acid-base balance

O69 Labor and delivery complicated by umbilical cord complications

O70 Perineal laceration during delivery

71.1 Rupture of uterus during labor

71.2 Postpartum inversion of uterus

71.3 Obstetric laceration of cervix

71.4 Obstetric high vaginal laceration alone

72.0 Third-stage hemorrhage

72.1 Other immediate postpartum hemorrhage

O74 Complications of anesthesia during labor and delivery

O76 Abnormality in fetal heart rate and rhythm complicating labor and delivery

O77 Other fetal stress complicating labor and delivery

O80 Encounter for full-term uncomplicated delivery

O82 Encounter for cesarean delivery without indication

O98 Maternal infectious and parasitic diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates childbirth or puerperium)

O99 Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates childbirth or puerperium)

O9A Maternal malignant neoplasms, traumatic injuries and abuse classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates childbirth or puerperium)

237 Outcome of delivery (For livebirth cohort, exclude 237.1, 237.4, 237.7 - all stillbirth codes)

238 Liveborn infants according to place of birth and type of delivery

239.0 Encounter for care and examination of mother immediately after delivery

**ICD-10 CODES INDICATING PREGNANCY WITH ABORTIVE/NON-LIVE BIRTH OUTCOMES**

**Dx codes:**

O00-O08 Pregnancy with abortive outcome

**Proc codes:**

10A Abortion

10D1729 Manual Extraction of Products of Conception, Retained, Via Natural or Artificial Opening

10D1722 Extraction of Products of Conception, Retained, Via Natural or Artificial Opening

10D1829 Manual Extraction of Products of Conception, Retained, Via Natural or Artificial Opening Endoscopic

10D1822 Extraction of Products of Conception, Retained, Via Natural or Artificial Opening Endoscopic

**ICD-10 CODES INDICATING ECTOPIC PREGNANCY**

10D2722 Extraction of Products of Conception, Ectopic, Via Natural or Artificial Opening

10D2822 Extraction of Products of Conception, Ectopic, Via Natural or Artificial Opening Endoscopic

10S2 Reposition Products of Conception, Ectopic

10T Resection (Ectopic)



## Appendix A

### Dialysis Codes

Codes include:

**- ICD9 prox codes:**

39.95, Hemodialysis

54.98, Peritoneal dialysis

**- ICD9 dx codes:**

585.5x, Chronic kidney disease, Stage V (for ESRD with no mention of dialysis)

585.6x, End stage renal disease (for ESRD with dialysis)

V56.0x, encounter for dialysis NOS

V56.8x, encounter for peritoneal dialysis

V45.1x, renal dialysis status

**- CPT4 codes:**

90957, 90960, ESRD related services monthly, for patients 12-19 and 20 years of age and older; with 4 or more face-to-face physician visits per month

90958, 90961, ESRD related services monthly, for patients 12-19 and 20 years of age and older; with 2-3 face-to-face physician visits

90959, 90962, ESRD related services monthly, for patients 12-19 and 20 years of age and older; with 1 face-to-face physician visit per

90920, 90921, ESRD related services per full month; for patients 12-19 and twenty years of age and over

90924, 90925, ESRD related services (less than full month), per day; for patients 12-19 and twenty years of age and over

90935, Hemodialysis procedure with single physician evaluation

90937, Hemodialysis procedure requiring repeated evaluation(s) with or without substantial revision of dialysis prescription

90945, Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies), with single physician evaluation

90947, Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies) requiring repeated physician evaluations, with or without substantial revision of dialysis prescription

90965, 90966, ESRD related services for home dialysis per full month, for patients 12-19 and 20 years of age and older

90969, 90970, ESRD related services for dialysis less than a full month of service, per day; for patients 12-19 and 20 years of age and

90989, Dialysis training, patient, including helper where applicable, any mode, completed course

90993, Dialysis training, patient, including helper where applicable, any mode, course not completed, per training session

90999, Unlisted dialysis procedure, inpatient or outpatient

99512, Home visit for hemodialysis

**- HCPCS codes:**

G0257, Unscheduled or emergency dialysis treatment for ESRD patient in a hospital outpatient dept. that is not certified as an ESRD

## Appendix A

G0314, G0317, ESRD related services during the course of treatment, for patients 12-19 and 20 yrs of age and over to include monitoring for the adequacy of nutrition, etc. w/4 or more physician visit per month

G0315, G0318, ESRD related services during the course of treatment, for patients 12-19 and 20 yrs of age and over to include monitoring for the adequacy of nutrition, etc. w/2 or 3 physician visit per month

G0316, G0319, ESRD related services during the course of treatment, for patients 12-19 and 20 yrs of age and over to include monitoring for the adequacy of nutrition, etc. w/1 physician visit per month

G0322, G0323, ESRD related services for home dialysis patients per full month: for patients 12-19 and 20 yrs of age and over to include monitoring for adequacy of nutrition and etc.

G0326, G0327, ESRD related services for home dialysis (less than full month), per day; for patients 12-19 and 20 yrs of age and over  
S9335, Home therapy, hemodialysis; administrative services, professional pharmacy services, care coordination, and all necessary supplies and equipment (drugs and nursing services coded separately), per diem

S9339, Home therapy, peritoneal dialysis, administrative services, care coordination and all necessary supplies and equipment, per

**OR**

Kidney transplant, defined as either 1 inpatient or 1 outpatient code

Codes include:

**-ICD9 dx codes:**

V42.0x, Kidney transplant status

996.81 Complications of transplanted kidney

**-ICD9 prox codes:**

55.6x, Transplant of kidney (Exclude 55.61)

**- CPT4 codes:**

50360, Renal allotransplantation, implantation, graft, w/o donor & recipient nephrectomy

50365, Renal allotransplantation, implantation, graft, w/ donor & recipient nephrectomy

## Appendix A

### Liver Bypass ICD-10 Procedure Codes

06100Z5 - Bypass Inferior Vena Cava to Superior Mesenteric Vein, Open Approach  
0610496 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06104K5 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06104Z5 - Bypass Inferior Vena Cava to Superior Mesenteric Vein, Percutaneous Endoscopic Approach  
06104ZY - Bypass Inferior Vena Cava to Lower Vein, Percutaneous Endoscopic Approach  
061107B - Bypass Splenic Vein to Left Renal Vein with Autologous Tissue Substitute, Open Approach  
0611099 - Bypass Splenic Vein to Right Renal Vein with Autologous Venous Tissue, Open Approach  
06110AY - Bypass Splenic Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
06110J9 - Bypass Splenic Vein to Right Renal Vein with Synthetic Substitute, Open Approach  
0611479 - Bypass Splenic Vein to Right Renal Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
061147Y - Bypass Splenic Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
06114J9 - Bypass Splenic Vein to Right Renal Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06120ZY - Bypass Gastric Vein to Lower Vein, Open Approach  
06140AY - Bypass Hepatic Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
061507Y - Bypass Superior Mesenteric Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
061509Y - Bypass Superior Mesenteric Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
061549Y - Bypass Superior Mesenteric Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06154AY - Bypass Superior Mesenteric Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
061647Y - Bypass Inferior Mesenteric Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
061709Y - Bypass Colic Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
061807Y - Bypass Portal Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
061809B - Bypass Portal Vein to Left Renal Vein with Autologous Venous Tissue, Open Approach  
061809Y - Bypass Portal Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
06180J9 - Bypass Portal Vein to Right Renal Vein with Synthetic Substitute, Open Approach  
06180Z9 - Bypass Portal Vein to Right Renal Vein, Open Approach  
0618479 - Bypass Portal Vein to Right Renal Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
061849B - Bypass Portal Vein to Left Renal Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06184AB - Bypass Portal Vein to Left Renal Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06184JB - Bypass Portal Vein to Left Renal Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06184ZB - Bypass Portal Vein to Left Renal Vein, Percutaneous Endoscopic Approach  
06190ZY - Bypass Right Renal Vein to Lower Vein, Open Approach  
061947Y - Bypass Right Renal Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
061949Y - Bypass Right Renal Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach

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061B0ZY - Bypass Left Renal Vein to Lower Vein, Open Approach  
061B4AY - Bypass Left Renal Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
061B4KY - Bypass Left Renal Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
061J09Y - Bypass Left Hypogastric Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
061J0KY - Bypass Left Hypogastric Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
06L30ZZ - Occlusion of Esophageal Vein, Open Approach  
061007Y - Bypass Inferior Vena Cava to Lower Vein with Autologous Tissue Substitute, Open Approach  
06100A5 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Autologous Arterial Tissue, Open Approach  
06100J5 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Synthetic Substitute, Open Approach  
06100K6 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Nonautologous Tissue Substitute, Open Approach  
06110JB - Bypass Splenic Vein to Left Renal Vein with Synthetic Substitute, Open Approach  
06110KB - Bypass Splenic Vein to Left Renal Vein with Nonautologous Tissue Substitute, Open Approach  
06114JY - Bypass Splenic Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
061207Y - Bypass Gastric Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
061407Y - Bypass Hepatic Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
061409Y - Bypass Hepatic Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
061449Y - Bypass Hepatic Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06144AY - Bypass Hepatic Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06150KY - Bypass Superior Mesenteric Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
06154ZY - Bypass Superior Mesenteric Vein to Lower Vein, Percutaneous Endoscopic Approach  
061607Y - Bypass Inferior Mesenteric Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
06160ZY - Bypass Inferior Mesenteric Vein to Lower Vein, Open Approach  
06164AY - Bypass Inferior Mesenteric Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
061749Y - Bypass Colic Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06174AY - Bypass Colic Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06174KY - Bypass Colic Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
0618099 - Bypass Portal Vein to Right Renal Vein with Autologous Venous Tissue, Open Approach  
06180K9 - Bypass Portal Vein to Right Renal Vein with Nonautologous Tissue Substitute, Open Approach  
06184J9 - Bypass Portal Vein to Right Renal Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06184JY - Bypass Portal Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06184Z9 - Bypass Portal Vein to Right Renal Vein, Percutaneous Endoscopic Approach  
061909Y - Bypass Right Renal Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
061J4JY - Bypass Left Hypogastric Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06L34CZ - Occlusion of Esophageal Vein with Extraluminal Device, Percutaneous Endoscopic Approach

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0610075 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Autologous Tissue Substitute, Open Approach  
06100A6 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Autologous Arterial Tissue, Open Approach  
06100K5 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Nonautologous Tissue Substitute, Open Approach  
06100KY - Bypass Inferior Vena Cava to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
06100ZY - Bypass Inferior Vena Cava to Lower Vein, Open Approach  
061049Y - Bypass Inferior Vena Cava to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06104A5 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06104A6 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06104JY - Bypass Inferior Vena Cava to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06104Z6 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein, Percutaneous Endoscopic Approach  
061107Y - Bypass Splenic Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
06110KY - Bypass Splenic Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
06110ZB - Bypass Splenic Vein to Left Renal Vein, Open Approach  
061149Y - Bypass Splenic Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06114A9 - Bypass Splenic Vein to Right Renal Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06114AB - Bypass Splenic Vein to Left Renal Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06114AY - Bypass Splenic Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06114ZB - Bypass Splenic Vein to Left Renal Vein, Percutaneous Endoscopic Approach  
06140KY - Bypass Hepatic Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
06140ZY - Bypass Hepatic Vein to Lower Vein, Open Approach  
06144ZY - Bypass Hepatic Vein to Lower Vein, Percutaneous Endoscopic Approach  
06150AY - Bypass Superior Mesenteric Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
06150ZY - Bypass Superior Mesenteric Vein to Lower Vein, Open Approach  
061609Y - Bypass Inferior Mesenteric Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
061649Y - Bypass Inferior Mesenteric Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06164JY - Bypass Inferior Mesenteric Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06164KY - Bypass Inferior Mesenteric Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06164ZY - Bypass Inferior Mesenteric Vein to Lower Vein, Percutaneous Endoscopic Approach  
06170KY - Bypass Colic Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
061807B - Bypass Portal Vein to Left Renal Vein with Autologous Tissue Substitute, Open Approach  
06180JB - Bypass Portal Vein to Left Renal Vein with Synthetic Substitute, Open Approach  
06180KY - Bypass Portal Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
06180ZY - Bypass Portal Vein to Lower Vein, Open Approach  
061847Y - Bypass Portal Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach

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06184DY - Bypass Portal Vein to Lower Vein with Intraluminal Device, Percutaneous Endoscopic Approach  
06184KY - Bypass Portal Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06190AY - Bypass Right Renal Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
06194JY - Bypass Right Renal Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
061B07Y - Bypass Left Renal Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
061B0AY - Bypass Left Renal Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
061B4ZY - Bypass Left Renal Vein to Lower Vein, Percutaneous Endoscopic Approach  
061J07Y - Bypass Left Hypogastric Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
061J4ZY - Bypass Left Hypogastric Vein to Lower Vein, Percutaneous Endoscopic Approach  
06L33DZ - Occlusion of Esophageal Vein with Intraluminal Device, Percutaneous Approach  
06L34DZ - Occlusion of Esophageal Vein with Intraluminal Device, Percutaneous Endoscopic Approach  
0610096 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Autologous Venous Tissue, Open Approach  
061009Y - Bypass Inferior Vena Cava to Lower Vein with Autologous Venous Tissue, Open Approach  
06100Z6 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein, Open Approach  
0610476 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
06104AY - Bypass Inferior Vena Cava to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06104J5 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06104J6 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06104KY - Bypass Inferior Vena Cava to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06110JY - Bypass Splenic Vein to Lower Vein with Synthetic Substitute, Open Approach  
06110K9 - Bypass Splenic Vein to Right Renal Vein with Nonautologous Tissue Substitute, Open Approach  
06110ZY - Bypass Splenic Vein to Lower Vein, Open Approach  
0611499 - Bypass Splenic Vein to Right Renal Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06114JB - Bypass Splenic Vein to Left Renal Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06114K9 - Bypass Splenic Vein to Right Renal Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06114KB - Bypass Splenic Vein to Left Renal Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06114KY - Bypass Splenic Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06114Z9 - Bypass Splenic Vein to Right Renal Vein, Percutaneous Endoscopic Approach  
06114ZY - Bypass Splenic Vein to Lower Vein, Percutaneous Endoscopic Approach  
06120KY - Bypass Gastric Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
061247Y - Bypass Gastric Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
061249Y - Bypass Gastric Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06124AY - Bypass Gastric Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06150JY - Bypass Superior Mesenteric Vein to Lower Vein with Synthetic Substitute, Open Approach

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06154JY - Bypass Superior Mesenteric Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06160KY - Bypass Inferior Mesenteric Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
061747Y - Bypass Colic Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
06174ZY - Bypass Colic Vein to Lower Vein, Percutaneous Endoscopic Approach  
0618079 - Bypass Portal Vein to Right Renal Vein with Autologous Tissue Substitute, Open Approach  
06180AY - Bypass Portal Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
06180JY - Bypass Portal Vein to Lower Vein with Synthetic Substitute, Open Approach  
06180KB - Bypass Portal Vein to Left Renal Vein with Nonautologous Tissue Substitute, Open Approach  
06180ZB - Bypass Portal Vein to Left Renal Vein, Open Approach  
06183DY - Bypass Portal Vein to Lower Vein with Intraluminal Device, Percutaneous Approach  
061847B - Bypass Portal Vein to Left Renal Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
0618499 - Bypass Portal Vein to Right Renal Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06184AY - Bypass Portal Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach  
06184K9 - Bypass Portal Vein to Right Renal Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06184ZY - Bypass Portal Vein to Lower Vein, Percutaneous Endoscopic Approach  
061907Y - Bypass Right Renal Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
06194ZY - Bypass Right Renal Vein to Lower Vein, Percutaneous Endoscopic Approach  
061B0JY - Bypass Left Renal Vein to Lower Vein with Synthetic Substitute, Open Approach  
061B0KY - Bypass Left Renal Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach  
061B47Y - Bypass Left Renal Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
061B4JY - Bypass Left Renal Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
061J0AY - Bypass Left Hypogastric Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
061J0ZY - Bypass Left Hypogastric Vein to Lower Vein, Open Approach  
061J47Y - Bypass Left Hypogastric Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
06L30CZ - Occlusion of Esophageal Vein with Extraluminal Device, Open Approach  
06L30DZ - Occlusion of Esophageal Vein with Intraluminal Device, Open Approach  
06L33CZ - Occlusion of Esophageal Vein with Extraluminal Device, Percutaneous Approach  
06L33ZZ - Occlusion of Esophageal Vein, Percutaneous Approach  
0610076 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Autologous Tissue Substitute, Open Approach  
0610095 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Autologous Venous Tissue, Open Approach  
06100AY - Bypass Inferior Vena Cava to Lower Vein with Autologous Arterial Tissue, Open Approach  
06100J6 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Synthetic Substitute, Open Approach  
06100JY - Bypass Inferior Vena Cava to Lower Vein with Synthetic Substitute, Open Approach  
0610475 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach

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061047Y - Bypass Inferior Vena Cava to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
0610495 - Bypass Inferior Vena Cava to Superior Mesenteric Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06104K6 - Bypass Inferior Vena Cava to Inferior Mesenteric Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
0611079 - Bypass Splenic Vein to Right Renal Vein with Autologous Tissue Substitute, Open Approach  
061109B - Bypass Splenic Vein to Left Renal Vein with Autologous Venous Tissue, Open Approach  
061109Y - Bypass Splenic Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
06110A9 - Bypass Splenic Vein to Right Renal Vein with Autologous Arterial Tissue, Open Approach  
06110AB - Bypass Splenic Vein to Left Renal Vein with Autologous Arterial Tissue, Open Approach  
06110Z9 - Bypass Splenic Vein to Right Renal Vein, Open Approach  
061147B - Bypass Splenic Vein to Left Renal Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
061149B - Bypass Splenic Vein to Left Renal Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
061209Y - Bypass Gastric Vein to Lower Vein with Autologous Venous Tissue, Open Approach  
06120AY - Bypass Gastric Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
06120JY - Bypass Gastric Vein to Lower Vein with Synthetic Substitute, Open Approach  
06124JY - Bypass Gastric Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06124KY - Bypass Gastric Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06124ZY - Bypass Gastric Vein to Lower Vein, Percutaneous Endoscopic Approach  
06140JY - Bypass Hepatic Vein to Lower Vein with Synthetic Substitute, Open Approach  
061447Y - Bypass Hepatic Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
06144JY - Bypass Hepatic Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06144KY - Bypass Hepatic Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
061547Y - Bypass Superior Mesenteric Vein to Lower Vein with Autologous Tissue Substitute, Percutaneous Endoscopic Approach  
06154KY - Bypass Superior Mesenteric Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach  
06160AY - Bypass Inferior Mesenteric Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
06160JY - Bypass Inferior Mesenteric Vein to Lower Vein with Synthetic Substitute, Open Approach  
061707Y - Bypass Colic Vein to Lower Vein with Autologous Tissue Substitute, Open Approach  
06170AY - Bypass Colic Vein to Lower Vein with Autologous Arterial Tissue, Open Approach  
06170JY - Bypass Colic Vein to Lower Vein with Synthetic Substitute, Open Approach  
06170ZY - Bypass Colic Vein to Lower Vein, Open Approach  
06174JY - Bypass Colic Vein to Lower Vein with Synthetic Substitute, Percutaneous Endoscopic Approach  
06180A9 - Bypass Portal Vein to Right Renal Vein with Autologous Arterial Tissue, Open Approach  
06180AB - Bypass Portal Vein to Left Renal Vein with Autologous Arterial Tissue, Open Approach  
061849Y - Bypass Portal Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach  
06184A9 - Bypass Portal Vein to Right Renal Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach



## Appendix A

06184KB - Bypass Portal Vein to Left Renal Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach

06190JY - Bypass Right Renal Vein to Lower Vein with Synthetic Substitute, Open Approach

06190KY - Bypass Right Renal Vein to Lower Vein with Nonautologous Tissue Substitute, Open Approach

06194AY - Bypass Right Renal Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach

06194KY - Bypass Right Renal Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach

061B09Y - Bypass Left Renal Vein to Lower Vein with Autologous Venous Tissue, Open Approach

061B49Y - Bypass Left Renal Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach

061J0JY - Bypass Left Hypogastric Vein to Lower Vein with Synthetic Substitute, Open Approach

061J49Y - Bypass Left Hypogastric Vein to Lower Vein with Autologous Venous Tissue, Percutaneous Endoscopic Approach

061J4AY - Bypass Left Hypogastric Vein to Lower Vein with Autologous Arterial Tissue, Percutaneous Endoscopic Approach

061J4KY - Bypass Left Hypogastric Vein to Lower Vein with Nonautologous Tissue Substitute, Percutaneous Endoscopic Approach

06L34ZZ - Occlusion of Esophageal Vein, Percutaneous Endoscopic Approach

**Procedure Codes Description****CPT-4 codes**

1960 Anesthesia for vaginal delivery only  
 1961 Anesthesia for cesarean delivery only  
 1962 Anesthesia for urgent hysterectomy following delivery  
 1963 Anesthesia for cesarean hysterectomy w/o any labor analgesia/anesthesia care 1967

**Neuraxial labor analgesia/anesthesia, planned vaginal delivery**

1968 Anesthesia for cesarean delivery following neuraxial labor analgesia/anesthesia 1969

**Anes for cesarean hysterectomy following neuraxial labor analgesia/anesthesia 59050****Fetal monitoring in labor, physician w/written report; s & i**

59051 Fetal monitoring in labor, physician w/written report; interpretation only  
 59400 ROUTINE TOTAL OBSTETRIC CARE including antepartum care, vaginal delivery (with or without episiotomy, and/or forceps) and postpartum care. 59409

**Vaginal delivery only (w/wo episiotomy &/or forceps)**

59410 Vaginal delivery only (w/wo episiotomy &/or forceps); w/postpartum care 59412

**Ext cephalic version, w/wo tocolysis**

59414 Delivery of placenta (separate proc)  
 59430 Postpartum care only  
 59510 Routine obstetric care w/antepartum care, cesarean delivery, & postpartum care 59514

**Cesarean delivery only**

59515 Cesarean delivery only; w/postpartum care  
 59525 Subtotal/total hysterectomy after cesarean delivery  
 59610 Routine obstetric care including antepartum care, vaginal delivery (with or without episiotomy, and/or forceps) and postpartum care, after previous cesarean delivery 59612

**Vaginal delivery only, after previous cesarean delivery (with or without episiotomy and/or forceps)**

59614 Vaginal delivery only, previous cesarean delivery w/postpartum care

**ICD-9 procedure codes**

72. x Forceps, vacuum, & breech  
 73. x Other including manual delivery  
 74xx Cesarean section  
 75.4x Manual removal of placenta

**ICD-10 procedure codes****Normal****Delivery**

10E0XZZ Delivery of Products of Conception, External Approach

**C-Section**

10D00Z0 Extraction of Products of Conception, High, Open Approach  
 10D00Z1 Extraction of Products of Conception, Low, Open Approach  
 10D00Z2 Extraction of Products of Conception, Extraperitoneal, Open Approach

**Other assisted delivery (forceps, vacuum, internal version, other)**

10D07Z3 Extraction of Products of Conception, Low Forceps, Via Natural or Artificial Opening 10D07Z4

Extraction of Products of Conception, Mid Forceps, Via Natural or Artificial Opening 10D07Z5

Extraction of Products of Conception, High Forceps, Via Natural or Artificial Opening 10D07Z6

Extraction of Products of Conception, Vacuum, Via Natural or Artificial Opening 10D07Z7

ICD-9 code	Definition	Gestational Age	
		Weeks	Days
765.21	Less than 24 c24		168
765.22	24 completed weeks of gestation		
765.23	25-26 comple 26		182
765.24	27-28 comple 28		196
765.25	29-30 comple 30		210
765.26	31-32 comple 32		224
765.27	33-34 comple 34		238
765.28	35-36 comple 36		252

ICD-10 code	Definition	Gestational Age
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P07.2	Weeks	Days
1 P07.2	Extreme imm 23	Extreme 161
2 P07.2	imm 23	Extreme 161
3 P07.2	imm 24	Extreme 168
4 P07.2	imm 25	Extreme 175
5 P07.2	imm 26	Extreme 182
6 P07.3	imm 27	Preterm 189
1 P07.3	new 28	Preterm 196
2 P07.3	new 29	Preterm 203
3 P07.3	new 30	Preterm 210
4 P07.3	new 31	Preterm 217
5 P07.3	new 32	Preterm 224
6 P07.3	new 33	Preterm 231
7 P07.3	new 34	Preterm 238
8 P07.3	new 35	Preterm 245
9	new 36	252

Codes indicating extreme prematurity

ICD-9 code	Definition	Gestational Age
		Weeks Days
765.0	Disorders rela	28 196
765.00	Extreme immaturity, unspecified [weight]	Extreme
765.01	immaturity, less than 500 grams	Extreme
765.02	immaturity, 500-749 grams	Extreme
765.03	immaturity, 750-999 grams	Extreme
765.04	immaturity, 1,000-1,249 grams	Extreme
765.05	immaturity, 1,250-1,499 grams	Extreme
765.06	immaturity, 1,500-1,749 grams	Extreme
765.07	immaturity, 1,750-1,999 grams	Extreme
765.08	immaturity, 2,000-2,499 grams	

ICD-10 code	Definition	Gestational Age
		Weeks Days
P07.2	Extreme imm	28 196
P07.20	Extreme immaturity of newborn, unspecified weeks of gestation	
O42.012	Preterm premature rupture of membranes, onset of labor within 24 hours of rupture, second trimester	

Other preterm codes

ICD-9 code	Definition	Gestational Age
		Weeks Days
765.1	Disorders rela	35 245
765.10	Other preterm infants, unspecified [weight]	Other
765.11	preterm infants, less than 500 grams	Other
765.12	preterm infants, 500-749 grams	Other
765.13	preterm infants, 750-999 grams	Other
765.14	preterm infants, 1,000-1,249 grams	Other
765.15	preterm infants, 1,250-1,499 grams	Other
765.16	preterm infants, 1,500-1,749 grams	Other
765.17	preterm infants, 1,750-1,999 grams	Other
765.18	preterm infants, 2,000-2,499 grams	
644.21	Onset of delivery before 37 completed weeks of gestation	

ICD-10 code	Definition	Gestational Age
		Weeks Days
P05.01	Disorders of n	35 245
P05.02	Disorders of newborn related to slow fetal growth and fetal malnutrition, 500-749 grams	Disorders
P05.03	of newborn related to slow fetal growth and fetal malnutrition, 750-999 grams	Disorders
P05.04	of newborn related to slow fetal growth and fetal malnutrition, 1000-1249 grams	Disorders
P05.05	of newborn related to slow fetal growth and fetal malnutrition, 1250-1499 grams	Disorders
P05.06	of newborn related to slow fetal growth and fetal malnutrition, 1500-1749 grams	Disorders
P05.07	of newborn related to slow fetal growth and fetal malnutrition, 1750-1999 grams	Newborn
P05.11	small for gestational age, less than 500 grams	
P05.12	Newborn small for gestational age, 500-749 grams	Newborn
P05.13	small for gestational age, 750-999 grams	Newborn
P05.14	small for gestational age, 1000-1249 grams	

P05.15 P0 Newborn small for gestational age, 1250-1499 grams Newborn  
P07.00 P0 small for gestational age, 1500-1749 grams Newborn  
O60.1 O4; small for gestational age, 1750-1999 grams Extremely  
low birth weight newborn  
Extremely low birth weight newborn, unspecified weight Extremely  
low birth weight newborn, less than 500 grams Extremely  
low birth weight newborn, 500-749 grams Extremely  
low birth weight newborn, 750-999 grams Other  
low birth weight newborn  
Other low birth weight newborn, unspecified weight Other  
low birth weight newborn, 1000-1249 grams Other  
low birth weight newborn, 1250-1499 grams Other  
low birth weight newborn, 1500-1749 grams Other  
low birth weight newborn, 1750-1999 grams Preterm  
[premature] newborn [other]  
Preterm newborn, unspecified weeks of gestation Preterm  
labor with preterm delivery  
Preterm premature rupture of membranes, onset of labor within 24 hours of rupture  
Preterm premature rupture of membranes, onset of labor within 24 hours of rupture, unspecified trimester  
Preterm premature rupture of membranes, onset of labor within 24 hours of rupture, third trimester

644.2 early onset of delivery  
644.20 Early onset of delivery, unspecified as to episode of care or not applicable  
644.21 Early onset of delivery, delivered, with or without mention of antepartum condition anemia  
776.6 of prematurity  
362.20 retinopathy of prematurity, unspecified retinopathy  
362.22 of prematurity, stage 0 retinopathy  
362.23 of prematurity, stage 1 retinopathy  
362.24 of prematurity, stage 2 retinopathy  
362.25 of prematurity, stage 3 retinopathy  
362.26 of prematurity, stage 4 retinopathy  
362.27 of prematurity, stage 5

**CPT**  
49491 repair, initial inguinal hernia, preterm infant (younger than 37 weeks gestation at birth), performed from birth up to 50 weeks postconception repair,  
49492 initial inguinal hernia, preterm infant (younger than 37 weeks gestation at birth), performed from birth up to 50 weeks postconception treatment  
67229 of extensive or progressive retinopathy, 1 or more sessions; preterm infant (less than 37 weeks gestation at birth), performed from anesthesia  
836 for hernia repairs in the lower abdomen not otherwise specified, infants younger than 37 weeks gestational age at birth

**ICD-10 code Definition**

H35.  
1 P61. Retinopathy of prematurity Anemia  
2 of prematurity  
V27.2 Twins both liveborn  
V27.3 Mother with twins one liveborn and one stillborn Mother  
V27.4 with twins both stillborn  
V27.5 Other multiple birth, all liveborn Other  
V27.6 multiple birth, some liveborn Twin,  
V31 V mate liveborn  
32 V33 Twin birth mate stillborn Twin,  
V34 V unspecified  
35 V36 Other multiple, mates all liveborn  
V37.6 Other multiple birth (three or more) mates all stillborn Other  
51 multiple, mates live- and stillborn  
651.0 x Other multiple, unspecified Multiple  
651.1 x gestation  
651.2 x Twin Pregnancy Triplet  
651.3 x pregnancy Quadruplet  
651.4 x pregnancy  
651.5 x Twin pregnancy with fetal loss and retention of one fetus  
651.6 x Triplet pregnancy with fetal loss and retention of one or more fetus(es) Quadruplet  
651.7 x pregnancy with fetal loss and retention of one or more fetus(es) Other  
651.8 x multiple pregnancy with fetal loss and retention of one or more fetus(es) Multiple  
651.9 x gestation following (elective) fetal reduction  
Other specified multiple gestation Unspecified  
multiple gestation

652.6x Multiple gestation with malpresentation of one fetus or more Locked  
660.5x Twins  
662.3x Delayed delivery of second twin, triplet,  
761.5x etc: Multiple pregnancy

ICD10 Code	Description
O30xxxx	Multiple gestation
O31xxxx	Complications specific to multiple gestation Fetus-to-fetus
O43.02	placental transfusion syndrome Delayed
O63.2	delivery of second twin, triplet, etc. Twins,
Z37.2	both liveborn
Z37.3	Twins, one liveborn and one stillborn Other
Z37.5	multiple births, all liveborn Multiple
Z37.50	births, unspecified, all liveborn Triplets,
Z37.51	all liveborn
Z37.52	Quadruplets, all liveborn Quintuplets,
Z37.53	all liveborn Sextuplets,
Z37.54	all liveborn
Z37.59	Other multiple births, all liveborn Other
Z37.6	multiple births, some liveborn
Z37.60	Multiple births, unspecified, some liveborn Triplets,
Z37.61	some liveborn
Z37.62	Quadruplets, some liveborn Quintuplets,
Z37.63	some liveborn Sextuplets,
Z37.64	some liveborn
Z37.69	Other multiple births, some liveborn Twin
Z38.3	liveborn infant, born in hospital Twin
Z38.30	liveborn infant, delivered vaginally
Z38.31	Twin liveborn infant, delivered by cesarean Twin
Z38.4	liveborn infant, born outside hospital
Z38.5	Twin liveborn infant, unspecified as to place of birth Other
Z38.6	multiple liveborn infant, born in hospital Triplet
Z38.61	liveborn infant, delivered vaginally
Z38.62	Triplet liveborn infant, delivered by cesarean Quadruplet
Z38.63	liveborn infant, delivered vaginally Quadruplet
Z38.64	liveborn infant, delivered by cesarean Quintuplet
Z38.65	liveborn infant, delivered vaginally Quintuplet
Z38.66	liveborn infant, delivered by cesarean Other
Z38.68	multiple liveborn infant, delivered vaginally Other
Z38.69	multiple liveborn infant, delivered by cesarean Other
Z38.7	multiple liveborn infant, born outside hospital
Z38.8	Other multiple liveborn infant, unspecified as to place of birth Newborn
P01.5	affected by multiple pregnancy
64	
5	Late Pregnancy
645.1	Post term pregnancy
645.10	Post term pregnancy, unspecified as to episode of care or not applicable
645.11	Post term pregnancy, delivered, with or without mention of antepartum condition Post
645.13	term pregnancy, antepartum condition or complication
645.2	Prolonged pregnancy
645.20	Prolonged pregnancy, unspecified as to episode of care or not applicable Prolonged
645.21	pregnancy, delivered, with or without mention of antepartum condition Prolonged
645.23	pregnancy, antepartum condition or complication
766.2	Late infant, not 'heavy-for-dates' Post-term
766.21	infant
766.22	Prolonged gestation of infant
O48	Late pregnancy
O48.0	Postterm pregnancy Prolonged
O48.1	pregnancy
P08.2	Late newborn, not heavy for gestational age Post-term
P08.21	newborn
P08.22	Prolonged gestation of newborn 41
Z3A.41	weeks gestation of pregnancy 42
Z3A.42	weeks gestation of pregnancy

Z3A.49 Greater than 42 weeks gestation of pregnancy

**ICD-10 CODES**

**INDICATING**

**PREGNANCY**

**Dx codes:**

O09.XYZ Supervision of high risk pregnancy (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O10 Pre-existing hypertension complicating pregnancy, childbirth and the puerperium (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O11 Pre-existing hypertension with pre-eclampsia (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O12 Gestational [pregnancy-induced] edema and proteinuria without hypertension (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period) O13  
Gestational [pregnancy-induced] hypertension without significant proteinuria (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period) O14  
Pre-eclampsia (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O15 Eclampsia (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O16 Unspecified maternal hypertension (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period) O20  
Hemorrhage in early pregnancy  
O21 Excessive vomiting in pregnancy (last digit refers to first/second/third/unspecified trimester) O22  
Venous complications and hemorrhoids in pregnancy  
O23 Infections of genitourinary tract in pregnancy (last digit refers to first/second/third/unspecified trimester)  
O24 Diabetes mellitus in pregnancy, childbirth, and the puerperium (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period) O25  
Malnutrition in pregnancy, childbirth and the puerperium (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period)  
O26 Maternal care for other conditions predominantly related to pregnancy (if last digit indicating first/second/third/unspecified trimester/unspecified as to time period) O28  
Abnormal findings on antenatal screening of mother  
O29 Complications of anesthesia during pregnancy (last digit refers to first/second/third/unspecified trimester) O30  
Multiple gestation (last digit refers to first/second/third/unspecified trimester)  
O31 Complications specific to multiple gestation (certain digit refers to first/second/third/unspecified trimester) O32  
Maternal care for malpresentation of fetus  
O33 Maternal care for disproportion  
O34 Maternal care for abnormality of pelvic organs (most codes indicate first/second/third/unspecified trimester)  
O35 Maternal care for known or suspected fetal abnormality and damage  
O36 Maternal care for other fetal problems (codes indicate first/second/third/unspecified trimester) O40  
Polyhydramnios (codes indicate first/second/third/unspecified trimester)  
O41 Other disorders of amniotic fluid and membranes (codes indicate first/second/third/unspecified trimester)  
O42.1 Premature rupture of membranes, onset of labor more than 24 hours following rupture  
O42.9 Premature rupture of membranes, unspecified as to length of time between rupture and onset of labor  
O43 Placental disorders (last digit refers to first/second/third/unspecified trimester)  
O44 Placenta previa (last digit refers to first/second/third/unspecified trimester)  
O45 Premature separation of placenta (last digit refers to first/second/third/unspecified trimester)  
O46 Antepartum hemorrhage, not elsewhere classified (last digit refers to first/second/third/unspecified trimester)  
O47 False labor  
O60.0 Preterm labor without delivery O61  
Failed induction of labor  
O71.0 Rupture of uterus (spontaneous) before onset of labor  
O72 Postpartum hemorrhage  
O72.2 Delayed and secondary postpartum hemorrhage  
O72.3 Postpartum coagulation defects  
O73 Retained placenta and membranes, without hemorrhage  
O75 Other complications of labor and delivery, not elsewhere classified  
O94 Sequelae of complication of pregnancy, childbirth, and the puerperium  
O98 Maternal infectious and parasitic diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates first trimester, second trimester, third trimester, unspecified, or nothing)  
O99 Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates first trimester, second trimester, third trimester, unspecified, or nothing)  
O9A Maternal malignant neoplasms, traumatic injuries and abuse classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates first trimester, second trimester, third trimester, unspecified, or nothing)  
Z32.01 Encounter for pregnancy test - result positive  
Z33 Pregnant state  
Z34 Encounter for supervision of normal pregnancy  
Z36 Encounter for antenatal screening of mother  
Z39 Encounter for maternal postpartum care and examination  
Z39.1 Encounter for care and examination of lactating mother  
Z39.2 Encounter for routine postpartum follow-up  
Z3A Weeks of gestation  
**Proc codes:**  
102 Change  
109 Drainage  
10H Insertion  
10J Inspection  
10P Removal  
10Q Repair

10S Reposition

10Y Transplantation

**ICD-10 CODES INDICATING DELIVERY (diagnostic codes that were not considered in the algorithm to identify deliveries)**

**Dx codes:**

Use the following codes only if the last digit indicates childbirth or puerperium or labor O10

Pre-existing hypertension complicating pregnancy, childbirth and the puerperium O11

Pre-existing hypertension with pre-eclampsia

O12 Gestational [pregnancy-induced] edema and proteinuria without hypertension O13

Gestational [pregnancy-induced] hypertension without significant proteinuria O14

Pre-eclampsia

O15 Eclampsia

O16 Unspecified maternal hypertension

O24 Diabetes mellitus in pregnancy, childbirth, and the puerperium

O25 Malnutrition in pregnancy, childbirth and the puerperium

O26 Maternal care for other conditions predominantly related to pregnancy

O42.0 Premature rupture of membranes, onset of labor within 24 hours of rupture, except O42.011 (first trimester)

O48 Late pregnancy

O60.1 Preterm labor with preterm delivery O60.2

Term delivery with preterm labor O62

Abnormalities of forces of labor

O63 Long labor

O64 Obstructed labor due to malposition and malpresentation of

fetus O65 Obstructed labor due to maternal pelvic abnormality

O66 Other obstructed labor

O67 Labor and delivery complicated by intrapartum hemorrhage, not elsewhere

classified O68 Labor and delivery complicated by abnormality of fetal acid-base balance

O69 Labor and delivery complicated by umbilical cord

complications O70 Perineal laceration during delivery

O71.1 Rupture of uterus during labor

O71.2 Postpartum inversion of uterus

O71.3 Obstetric laceration of cervix

O71.4 Obstetric high vaginal laceration alone

O72.0 Third-stage hemorrhage

O72.1 Other immediate postpartum hemorrhage

O74 Complications of anesthesia during labor and delivery

O76 Abnormality in fetal heart rate and rhythm complicating labor and

delivery O77 Other fetal stress complicating labor and delivery

O80 Encounter for full-term uncomplicated

delivery O82 Encounter for cesarean delivery without

indication

O98 Maternal infectious and parasitic diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates childbirth or puerperium)

O99 Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates childbirth or puerperium)

O9A Maternal malignant neoplasms, traumatic injuries and abuse classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (if last digit indicates childbirth or puerperium)

Z37 Outcome of delivery (For livebirth cohort, exclude Z37.1, Z37.4, Z37.7 - all stillbirth codes)

Z38 Liveborn infants according to place of birth and type of delivery

**ICD-10 CODES INDICATING PREGNANCY WITH ABORTIVE/NON-LIVE BIRTH OUTCOMES**

**Dx codes:**

O00-O08 Pregnancy with abortive outcome

**Proc codes:**

10A Abortion

10D17Z9 Manual Extraction of Products of Conception, Retained, Via Natural or Artificial Opening

10D17ZZ Extraction of Products of Conception, Retained, Via Natural or Artificial Opening

10D18Z9 Manual Extraction of Products of Conception, Retained, Via Natural or Artificial Opening Endoscopic

10D18ZZ Extraction of Products of Conception, Retained, Via Natural or Artificial Opening Endoscopic

**ICD-10 CODES INDICATING ECTOPIC PREGNANCY**

10D27ZZ Extraction of Products of Conception, Ectopic, Via Natural or Artificial Opening

10D28ZZ Extraction of Products of Conception, Ectopic, Via Natural or Artificial Opening Endoscopic

10S2 Reposition Products of Conception, Ectopic

10T Resection (Ectopic)

Unmatched

Table with columns: Variable, Optum, MarketScan, Medicare, Pooled. Rows include demographic and clinical variables such as Age, Calendar Year, Race, Gender, Region, Combined comorbidity score, Lifestyle Factors, and Comorbidities. Each cell contains a value and a difference (St. Diff.) from the Pooled group.





...median [IQR]	5.00 [2.00, 11.00]	6.00 [2.00, 13.00]	-0.08	4.00 [1.00, 8.00]	4.00 [1.00, 8.00]	0.00	5.00 [2.00, 11.00]	5.00 [2.00, 11.00]	0.00	4.82 (10.02)	5.08 (10.70)	-0.03
HU - Number of different/distinct medication prescriptions												
...mean (sd)	8.27 (4.49)	8.80 (4.57)	-0.12	7.93 (4.40)	8.28 (4.46)	-0.08	8.91 (4.39)	9.11 (4.38)	-0.05	8.62 (4.41)	8.90 (4.44)	-0.06
...median [IQR]	8.00 [5.00, 11.00]	8.00 [5.00, 11.00]	0.00	7.00 [5.00, 10.00]	8.00 [5.00, 11.00]	-0.23	8.00 [6.00, 11.00]	8.00 [6.00, 12.00]	0.00	7.82 (4.41)	8.00 (4.44)	-0.04
HU Total N distinct ICD9/ICD10 diagnoses at the 3rd digit level												
...mean (sd)	8.26 (9.64)	11.99 (11.61)	-0.35	4.30 (6.67)	6.85 (8.07)	-0.34	8.17 (9.90)	11.04 (11.08)	-0.27	7.48 (9.35)	10.57 (10.78)	-0.31
...median [IQR]	6.00 [0.00, 12.00]	9.00 [4.00, 17.00]	-0.28	1.00 [0.00, 6.00]	4.00 [0.00, 10.00]	-0.41	5.00 [0.00, 13.00]	9.00 [1.00, 17.00]	-0.38	4.44 (9.35)	8.17 (10.78)	-0.37
HU - Number of Office visits												
...mean (sd)	5.05 (3.75)	5.15 (3.73)	-0.03	4.92 (3.80)	5.05 (3.82)	-0.03	12.51 (11.50)	12.74 (11.81)	-0.02	9.85 (9.51)	9.63 (9.40)	0.02
...median [IQR]	4.00 [2.00, 7.00]	4.00 [3.00, 7.00]	0.00	4.00 [2.00, 7.00]	4.00 [2.00, 7.00]	0.00	10.00 [5.00, 16.00]	17.00 [10.00, 17.00]	0.00	7.88 (9.51)	7.55 (9.40)	0.03
HU - Number of Cardiologist visits												
...mean (sd)	4.26 (5.03)	4.91 (5.46)	-0.12	3.11 (4.31)	3.40 (4.50)	-0.07	5.06 (6.08)	5.35 (6.10)	-0.05	4.57 (5.62)	4.92 (5.71)	-0.06
...median [IQR]	3.00 [1.00, 6.00]	3.00 [1.00, 7.00]	0.00	2.00 [0.00, 4.00]	2.00 [0.00, 5.00]	0.00	3.00 [1.00, 7.00]	4.00 [1.00, 7.00]	-0.16	2.82 (5.62)	3.43 (5.71)	-0.11
HU - Number electrocardiograms												
...mean (sd)	2.14 (2.29)	2.34 (2.41)	-0.09	1.92 (1.99)	2.03 (2.01)	-0.05	2.27 (2.06)	2.44 (2.15)	-0.08	2.18 (2.09)	2.35 (2.19)	-0.08
...median [IQR]	2.00 [1.00, 3.00]	2.00 [1.00, 3.00]	0.00	1.00 [1.00, 3.00]	2.00 [1.00, 3.00]	-0.50	2.00 [1.00, 3.00]	3.00 [1.00, 3.00]	0.00	1.82 (2.09)	2.00 (2.19)	-0.08
HU - Number of echocardiograms												
...mean (sd)	1.15 (3.20)	1.25 (3.37)	-0.03	0.86 (1.35)	0.96 (1.43)	-0.07	0.90 (1.24)	1.01 (1.28)	-0.09	0.94 (1.76)	1.06 (2.01)	-0.06
...median [IQR]	0.00 [0.00, 1.00]	1.00 [0.00, 1.00]	-0.30	0.00 [0.00, 1.00]	1.00 [0.00, 1.00]	-0.72	1.00 [0.00, 1.00]	1.00 [0.00, 2.00]	0.00	0.65 (1.76)	1.00 (2.01)	-0.19
HU - Number of neurologist visits												
...mean (sd)	0.32 (1.70)	0.42 (1.85)	-0.06	0.18 (1.09)	0.21 (1.16)	-0.03	0.36 (1.82)	0.44 (1.86)	-0.04	0.32 (1.69)	0.40 (1.76)	-0.05
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (1.69)	0.00 (1.76)	0.00
HU - Fecal occult blood (FOB) test; n (%)	1,505 (3.8%)	2,236 (3.1%)	0.04	1,223 (2.9%)	1,327 (2.7%)	0.01	4,622 (3.1%)	5,346 (3.0%)	0.01	7,350 (3.2%)	8,909 (3.0%)	0.04
HU - Number of PT or aPTT tests												
...mean (sd)	0.41 (1.20)	0.40 (1.14)	0.01	0.39 (1.13)	0.37 (1.10)	0.02	0.34 (1.08)	0.33 (0.99)	0.01	0.36 (1.11)	0.35 (1.05)	0.01
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (1.11)	0.00 (1.05)	0.00
N of days in database anytime prior												
...mean (sd)	1,873.87 (1,373.15)	1,997.86 (1,480.21)	-0.09	2,369.06 (1,488.04)	2,555.93 (1,598.77)	-0.12	767.20 (508.76)	789.93 (494.30)	-0.05	1,248.74 (945.52)	1,375.59 (1,048.57)	-0.13
...median [IQR]	1,493.00 [717.00, 2,895.00]	1,564.00 [756.00, 3,051.00]	-0.05	2,168.00 [1,048.00, 3,668.75]	2,395.00 [1,138.00, 3,906.00]	-0.15	615.00 [465.00, 863.00]	658.00 [497.00, 909.00]	-0.09	1,048.37 (945.52)	1,165.71 (1,048.57)	-0.12
<b>Socioeconomic Status Proxy Variables</b>												
SES - Mean Copay for per prescription cost (charges in U.S. \$)												
...mean (sd)	21.67 (29.08)	20.24 (27.51)	0.05	15.18 (20.95)	14.15 (20.04)	0.05	115.27 (137.49)	113.78 (113.51)	0.01	80.98 (111.55)	74.59 (88.74)	0.06
...median [IQR]	14.16 [6.00, 27.52]	12.92 [5.39, 25.50]	0.04	10.21 [4.18, 19.95]	9.68 [3.97, 18.31]	0.03	80.00 [63.00, 132.00]	84.26 [64.26, 131.13]	-0.01	62.46 (111.55)	58.43 (88.74)	0.04
...Missing; n (%)	1,786 (4.5%)	2,434 (3.4%)	0.06	3,963 (9.5%)	6,979 (14.1%)	-0.14	3,567 (2.4%)	3,282 (1.9%)	0.03	9,316 (4.0%)	12,695 (4.3%)	-0.02
SES - Copay: pharmacy cost												
...mean (sd)	203.92 (310.68)	201.17 (313.71)	0.01	129.33 (193.24)	119.00 (205.46)	0.05	159.63 (302.48)	210.89 (354.92)	-0.16	161.72 (287.23)	193.29 (324.65)	-0.10
...median [IQR]	105.00 [30.00, 267.78]	101.10 [30.00, 257.34]	0.01	66.00 [6.12, 173.54]	55.32 [0.00, 155.54]	0.05	51.43 [0.00, 194.68]	97.00 [18.07, 264.50]	-0.14	63.28 (287.23)	91.08 (324.65)	-0.09
SES - Business type: Commercial vs Medicare												
...Commercial; n (%)	10,520 (26.6%)	12,610 (17.5%)	0.22	20,919 (49.9%)	22,834 (46.1%)	0.08	0 (0.0%)	0 (0.0%)	0.00	31,439 (13.6%)	35,444 (11.9%)	0.05
...Medicare; n (%)	29,054 (73.4%)	59,651 (82.5%)	-0.22	21,013 (50.1%)	26,669 (53.9%)	-0.08	0 (0.0%)	0 (0.0%)	0.00	50,067 (21.7%)	86,320 (28.9%)	-0.17
SES - Low income indicator; n (%)	4,702 (11.9%)	9,719 (13.4%)	-0.05	0 (0.0%)	0 (0.0%)	0.00	0 (0.0%)	0 (0.0%)	0.00	4,702 (2.0%)	9,719 (3.3%)	-0.08
SES - Urban vs Rural (MSA variable)												
...Urban; n (%)	0 (0.0%)	0 (0.0%)	0.00	29,285 (69.8%)	30,344 (61.3%)	0.18	0 (0.0%)	0 (0.0%)	0.00	29,285 (12.7%)	30,344 (10.2%)	0.08
...Rural; n (%)	0 (0.0%)	0 (0.0%)	0.00	2,571 (6.1%)	5,127 (10.4%)	-0.16	0 (0.0%)	0 (0.0%)	0.00	2,571 (1.1%)	5,127 (1.7%)	-0.05
...Unknown/Missing; n (%)	0 (0.0%)	0 (0.0%)	0.00	10,076 (24.0%)	14,032 (28.3%)	-0.10	0 (0.0%)	0 (0.0%)	0.00	10,076 (4.4%)	14,032 (4.7%)	-0.01
SES - Dual Status; n (%)	0 (0.0%)	0 (0.0%)	0.00	0 (0.0%)	0 (0.0%)	0.00	24,143 (16.2%)	25,715 (14.6%)	0.04	24,143 (10.5%)	25,715 (8.6%)	0.06
SES - Generic name prescription - unique value												
...mean (sd)	8.27 (4.49)	8.80 (4.57)	-0.12	7.93 (4.40)	8.28 (4.46)	-0.08	8.91 (4.39)	9.11 (4.38)	-0.05	8.62 (4.41)	8.90 (4.44)	-0.06
...median [IQR]	8.00 [5.00, 11.00]	8.00 [5.00, 11.00]	-0.18	7.00 [5.00, 10.00]	8.00 [5.00, 11.00]	-0.23	8.00 [6.00, 11.00]	8.00 [6.00, 12.00]	0.00	7.82 (4.41)	8.00 (4.44)	-0.04
SES - Brand name prescription - unique value												
...mean (sd)	8.35 (4.58)	8.89 (4.66)	-0.12	8.04 (4.50)	8.39 (4.55)	-0.08	9.02 (4.48)	9.22 (4.47)	-0.04	8.73 (4.50)	9.00 (4.53)	-0.06
...median [IQR]	8.00 [5.00, 11.00]	8.00 [6.00, 11.00]	0.00	7.00 [5.00, 10.00]	8.00 [5.00, 11.00]	-0.22	8.00 [6.00, 11.00]	9.00 [6.00, 12.00]	-0.22	7.82 (4.50)	8.59 (4.53)	-0.17





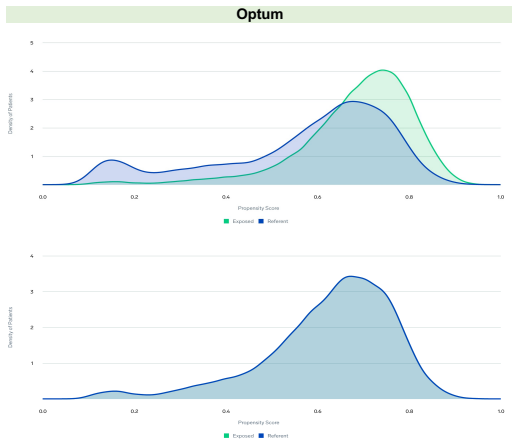
...median [QQR]

8.00 [5.00, 11.00] 8.00 [5.00, 11.00] 0

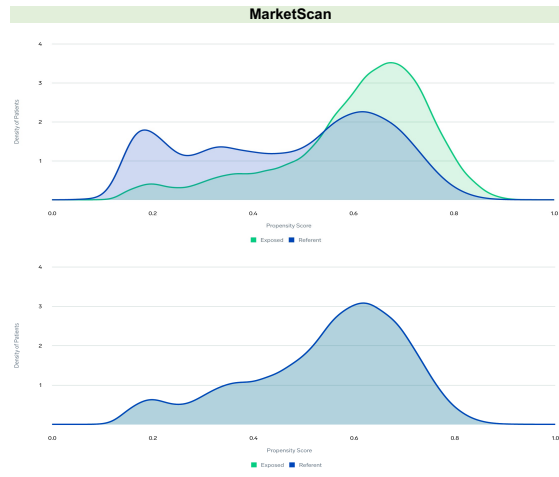
7.00 [5.00, 11.00] 7.00 [5.00, 11.00] 0

8.00 [6.00, 11.00] 8.00 [6.00, 11.00] 0

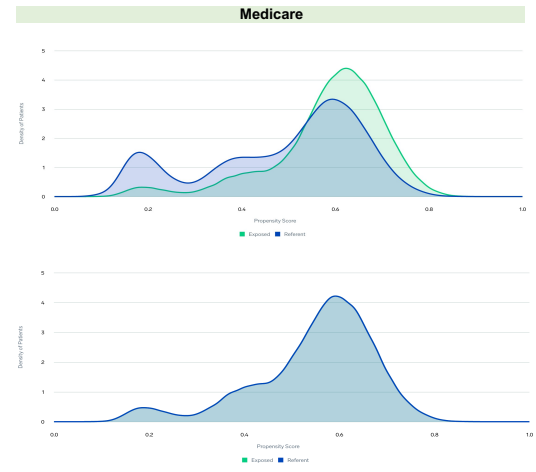
7.83 (7.58) 7.83 (4.48) 0



The c-statistics for the propensity score model, pre-matching was 0.687. The post-matching c-statistic was 0.514



The c-statistics for the propensity score model, pre-matching was 0.707. The post-matching c-statistic was 0.513



The c-statistics for the propensity score model, pre-matching was 0.668. The post-matching c-statistic was 0.506