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The following report(s) provides findings from an FDA-initiated query using Sentinel. While Sentinel queries may be undertaken to assess potential medical product safety risks, they may also be initiated for various other reasons. Some examples include determining a rate or count of an identified health outcome of interest, examining medical product use, exploring the feasibility of future, more detailed analyses within Sentinel, and seeking to better understand Sentinel capabilities.

Data obtained through Sentinel are intended to complement other types of evidence such as preclinical studies, clinical trials, postmarket studies, and adverse event reports, all of which are used by FDA to inform regulatory decisions regarding medical product safety. The information contained in this report is provided as part of FDA's commitment to place knowledge acquired from Sentinel in the public domain as soon as possible. Any public health actions taken by FDA regarding products involved in Sentinel queries will continue to be communicated through existing channels.

FDA wants to emphasize that the fact that FDA has initiated a query involving a medical product and is reporting findings related to that query does not mean that FDA is suggesting health care practitioners should change their prescribing practices for the medical product or that patients taking the medical product should stop using it. Patients who have questions about the use of an identified medical product should contact their health care practitioners.

The following report contains a description of the request, request specifications, and results from the modular program run(s).

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Overview - Report 3 of 7

Request ID: cder_mpl2p_wp001_nsdv_v01

Report Description: This report investigated the association between new continuous or extended combined oral contraceptive (COC) use and venous thromboembolism (VTE), with new cyclic COC use as the comparison exposure. A broad definition of VTE was used. Report 1 contains the primary analysis of the request, and reports 2 and 4-7 contain results from additional sensitivity analyses with varying exposure incidence criteria, follow-up periods, or exposure groups.

Data Source: Data from May 22, 2007 to September 30, 2015 from 12 Data Partners contributing to the Sentinel Distributed Database were included in this report. This request was distributed to Data Partners on March 28, 2017. Please note that four Data Partners were excluded from this report because their propensity score models did not fully converge.

Sentinel Modular Program Tool: Cohort Identification and Descriptive Analysis (CIDA) tool, Version 3.3.1, and a Rapid Analytic Development and Response (RADaR) module

Study Design: This study used a retrospective new-user cohort design.

Exposure and Comparator: The exposure of interest was new continuous or extended COC use and the comparator of interest was new cyclic COC use. The exposure and comparator drugs were defined using National Drug Codes (NDCs). For a list of generic and brand names used to define the exposure and comparator drugs, please see Appendices A and B.

Cohort Eligibility Criteria: Females aged 18 to 50 years with continuous enrollment in plans with both medical and drug coverage for at least 183 days before exposure initiation, during which gaps in coverage of up to 45 days were allowed, were eligible to be included in the cohort. New use was defined as no use of the exposure of interest in the previous 183 days. Patients were excluded from the cohort if they had evidence of anticoagulant use, malignant cancer, chemotherapy or radiation use, pregnancy and post-partum status (defined as 42 days after delivery date), transplant and complications, organ failure, human immunodeficiency virus, or VTE (broad definition) in the 183 days prior to exposure initiation. Anticoagulant use was defined using NDCs (see Appendix C for list of generic and brand names) and the remaining exclusions were defined using International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis and procedure codes and Current Procedural Terminology, Fourth Edition (CPT-4) codes (see Appendix D).

Pregnancy Identification: A previously-validated algorithm¹ from Sentinel's Medication Exposure in Pregnancy Risk Evaluation Program (MEPREP) was used to identify pregnancies with live birth deliveries within the study cohort. This algorithm used pre-/post-term delivery codes that occurred within 7 days of a delivery date in the inpatient care setting to determine a pregnancy duration. In absence of pre-/post-term codes, pregnancy duration was set to 273 days. Please see Appendix E for more details about this algorithm and for a list of delivery codes defined using ICD-9-CM diagnosis and procedure codes and CPT-4 codes.

Follow-up: Follow-up time was determined by the length of the exposure episodes. Exposure episode lengths were defined using outpatient pharmacy dispensing days supplied to create a window of continuous exposure. Exposure episodes were considered continuous if gaps in days supplied were 30 days or less. The end date of each exposure episode was then extended by 30 additional days. Follow-up began on the first day of exposure initiation and continued until the first occurrence of any of the following: 1) an outcome (VTE) diagnosis code; 2) a dispensing of the comparator drug, a non-oral combined contraceptive or a progestin-only contraceptive; 3) livebirth delivery code; 4) pregnancy start date; 5) disenrollment; 6) disenrollment due to death; 7) end of exposure episode; or 8) end of query period (September 30, 2015). Only the first valid exposure episode that occurred during the study period was included per patient.

Overview - Report 3 of 7

Outcome of Interest: VTE outcomes were defined using a broad definition as the occurrence of an inpatient diagnosis of VTE or an outpatient diagnosis of VTE plus anticoagulant treatment within 4 weeks following the outpatient VTE diagnosis. VTE was defined using ICD-9-CM diagnosis codes (see Appendix F for a list of codes and a pictorial summary of the VTE definition). Exposure episodes were excluded if an outcome occurred on the day of exposure initiation.

Propensity Score Estimation: The following covariates were assessed during the baseline period and were included in the propensity score: age, year, comorbidity score, health service utilization, drug utilization, and the following drug use and medical condition categories: use of any non-study hormonal contraceptive, use of the other study group drug, gynecological conditions, hypercoagulable states and coagulation defects, cardiovascular and metabolic conditions, cardiac conditions, venous catheterization, renal conditions, inflammatory conditions, obesity and overweight, tobacco use, immobility, and surgery. For a more detailed list of the conditions included in these covariate categories and codes used to define covariates, please see Appendices G, H, and I. Occurrences of these covariates were evaluated in the 183 days prior to exposure initiation. The Propensity Score Matching (PSM) tool was used to calculate the propensity scores and identify matched cohorts based on propensity scores. Propensity score estimation and matching was performed separately within each Data Partner site.

Five additional characteristics were also assessed at baseline, but were not included in the propensity score estimation models: sickle cell anemia, cystic fibrosis, cerebral palsy, thoracic outlet syndrome, and infectious diseases (see Appendices G and H).

Matching: The matching ratio for the propensity score was 1:1. Patients in the exposed and comparator cohorts were nearest neighbor matched without replacement, meaning that each comparator patient was matched one time, at most, to an exposed patient. The matching caliper was 0.010.

Effect Estimates: Cox proportional hazard regression models were used to estimate hazard ratios and corresponding 95% confidence intervals for the unmatched analysis and the 1:1 unconditional matched analysis.

See Appendix J for complete specifications for this request.

Limitations: 1) As with all observational studies, this evaluation was limited in its ability to control for all sources of potential bias. 2) The exposures, outcome, exclusions, episode truncation criteria, and covariates may have been misclassified due to imperfect algorithms used to identify them.

Notes: Please contact the Sentinel Operations Center Query Fulfillment Team (qf@sentinelssystem.org) for questions and to provide comments/suggestions for future enhancements to this document.

¹ Andrade SE, Davis RL, Cheetham TC, et al. Medication Exposure in Pregnancy Risk Evaluation Program. *Matern Child Health J.* 2012 Oct;16(7):1349-54. doi: 10.1007/s10995-011-0902-x

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Glossary of Terms for Analyses Using Cohort Identification and Descriptive Analysis (CIDA) Tool*

Amount Supplied - number of units (pills, tablets, vials) dispensed. Net amount per NDC per dispensing.

Blackout Period - number of days at the beginning of a treatment episode that events are to be ignored. If an event occurs during the blackout period, the episode is excluded.

Care Setting - type of medical encounter or facility where the exposure, event, or condition code was recorded. Possible care settings are listed below. For laboratory results, possible care settings include: Emergency department (E), Home (H), Inpatient (I), Outpatient (O), or Unknown or Missing (U). Along with the Principal Diagnosis Indicator, this forms the Care Setting/PDX parameter.

Ambulatory Visit (AV) - includes visits at outpatient clinics, same-day surgeries, urgent care visits, and other same-day ambulatory hospital encounters. Excludes emergency department encounters.

Emergency Department (ED) - includes ED encounters that become inpatient stays (in which case inpatient stays would be a separate encounter). Excludes urgent care visits.

Inpatient Hospital Stay (IP) - includes all inpatient stays, same-day hospital discharges, hospital transfers, and acute hospital care where the discharge is after the admission date.

Non-Acute Institutional Stay (IS) - includes hospice, skilled nursing facility, rehab center, nursing home, residential, overnight non-hospital dialysis and other non-hospital stays.

Other Ambulatory Visit (OA) - includes other non-overnight AV encounters such as hospice visits, home health visits, skilled nursing facility visits, other non-hospital visits, as well as telemedicine, telephone and email consultations.

Cohort Definition (drug/exposure) - indicates how the cohort will be defined: (1) 01: Cohort includes only the first valid treatment episode during the query period; (2) 02: Cohort includes all valid treatment episodes during the query period; (3) 03: Cohort includes all valid treatment episodes during the query period until an event occurs.

Days Supplied - number of days supplied for all dispensings in qualifying treatment episodes.

Eligible Members - number of members eligible for an incident treatment episode (defined by the drug/exposure and event washout periods) with drug and medical coverage during the query period.

Enrollment Gap - number of days allowed between two consecutive enrollment periods without breaking a "continuously enrolled" sequence.

Episodes - treatment episodes; length of episode is determined by days supplied in one dispensing or consecutive dispensings bridged by the episode gap.

Episode Gap - number of days allowed between two (or more) consecutive exposures (dispensings/procedures) to be considered the same treatment episode.

Event Deduplication - specifies how events are counted: (0) 0: Counts all occurrences of an HOI during an exposure episode; (1) 1: de-duplicates occurrences of the same HOI code and code type on the same day; (2) 2: de-duplicates occurrences of the same HOI group on the same day (e.g., de-duplicates at the group level).

Exposure Episode Length - number of days after exposure initiation that is considered "exposed time."

Exposure Extension Period - number of days post treatment period in which the outcomes/events are counted for a treatment episode. Extensions days are added after episode gaps have been bridged.

Lookback Period - number of days wherein a member is required to have evidence of pre-existing condition (diagnosis/procedure/drug dispensing).

Maximum Episode Duration - truncates exposure episodes after a requester-specified number of exposed days. Applied after any gaps are bridged and extension days added to the length of the exposure episode.

Member-Years - sum of all days of enrollment with medical and drug coverage in the query period preceded by an exposure washout period all divided by 365.25.

Minimum Days Supplied - specifies a minimum number of days in length of the days supplied for the episode to be considered.

Minimum Episode Duration - specifies a minimum number of days in length of the episode for it to be considered. Applied after any gaps are bridged and extension days added to the length of the exposure episode.

Monitoring Period - used to define time periods of interest for both sequential analysis and simple cohort characterization requests.

Principal Diagnosis (PDX) - diagnosis or condition established to be chiefly responsible for admission of the patient to the hospital. 'P' = principal diagnosis, 'S' = secondary diagnosis, 'X' = unspecified diagnosis, '' = blank. Along with the Care Setting values, forms the Caresetting/PDX parameter.

Query Period - period in which the modular program looks for exposures and outcomes of interest.

Treatment Episode Truncation Indicator - indicates whether the exposure episode will be truncated at the occurrence of a requester-specified code.

Washout Period (drug/exposure) - number of days a user is required to have no evidence of prior exposure (drug dispensing/procedure) and continuous drug and medical coverage prior to an incident treatment episode.

Washout Period (event/outcome) - number of days a user is required to have no evidence of a prior event (procedure/diagnosis) and continuous drug and medical coverage prior to an incident treatment episode.

Years at Risk - number of days supplied plus any episode gaps and exposure extension periods all divided by 365.25.

*all terms may not be used in this report

Glossary of Terms for Analyses Using Propensity Score Matching (PSM) Tool*

Covariate - requester defined binary variable to include in the propensity score estimation model (e.g., diabetes, heart failure, etc.) during requester-defined lookback period. Requester may also choose to add any of the following categorical, continuous, or count metrics to the propensity score estimation model:

1. Age (continuous)
2. Sex
3. Time period (i.e., monitoring period for sequential analyses)
4. Year of exposure
5. Comorbidity score
6. Medical utilization – number of inpatient stays
7. Medical utilization – number of institutional stays
8. Medical utilization – number of emergency department visits
9. Medical utilization – number of outpatient visits
10. Health care utilization – number of other ambulatory encounters (e.g., telemedicine, email consults)
11. Drug utilization – number of dispensings
12. Drug utilization – number of unique generics dispensed
13. Drug Utilization – number of unique drug classes dispensed

Covariate Evaluation Window - specified number of days relative to index date to evaluate the occurrence of covariates of interest. Note: members are required to have continuous enrollment during the covariate evaluation window, regardless of the value included in the "Continuous enrollment before exposure" field.

Mahalanobis Distance - provides a measure of balance across all variables while accounting for their correlation.

Matching Caliper - maximum allowed difference in propensity scores between treatment and control patients. Requester may select any caliper (e.g., 0.01, 0.025, and 0.05).

Matching Ratio - patients in exposed and comparator groups are nearest neighbor matched by a 1:1 or 1:n (up to 10) matching ratio.

Matched Conditional and Unconditional Analysis - in a conditional matched analysis, a Cox model, stratified by Data Partner site and matched set, is run on the matched population. This can be done for both the both 1:1 and 1:n matched cohorts. In an unconditional analysis, a Cox model, stratified by Data Partner site only, is run on the matched population. This can be done for the 1:1 matched cohort only.

Propensity Score Stratification - option to stratify propensity scores based on requester-defined percentiles in the unmatched population. In a stratified analysis, a Cox model, stratified by Data Partner site, is run on the stratified population. Note that all patients identified in exposure and comparator cohorts are used in the analysis.

PSM Tool - performs effect estimation by comparing exposure propensity-score matched parallel new user cohorts. Propensity score estimation and matching are conducted within each Sentinel Data Partner site via distributed programming code; data are returned to the SOC, aggregated, and used to calculate effect estimates.

Subgroup Analysis - may be conducted using any requester-defined covariates. Subgroup analyses may be performed in the unmatched and the matched population.

Zero Cell Correction - indicator for whether to screen variables with a zero correction added to each cell in the confounder/outcome 2x2 table. Recommended when the number of exposed outcomes is fewer than 150.

*all terms may not be used in this report

Table 1a. Cohort of New Initiators of Continuous or Extended Combined Oral Contraceptives and Cyclic Combined Oral Contraceptives (VTE Broad Definition) (Unmatched, Aggregated), Ratio 1:1, Caliper = 0.01

Characteristic ¹	Medical Product				Covariate Balance	
	Continuous or Extended Combined Oral Contraceptives		Cyclic Combined Oral Contraceptives		Absolute Difference	Standardized Difference
	N/Mean	%/Std Dev ²	N/Mean	%/Std Dev ²		
Patients (N)	210,691	100.0%	522,316	100.0%	-	-
Demographics:						
Mean age	30.4	8.6	28.8	8.3	1.685	0.200
Age: 18-24	70,441	33.4%	216,203	41.4%	-7.960	-0.165
Age: 25-34	75,628	35.9%	185,696	35.6%	0.343	0.007
Age: 35-50	64,622	30.7%	120,417	23.1%	7.617	0.172
Gender (Female)	210,691	100.0%	522,316	100.0%	0.000	-
History of use:						
Other Study Combined Hormonal Contraceptive	6,222	3.0%	4,613	0.9%	2.070	0.151
Any Non-study Combined Hormonal Contraceptive	73,661	35.0%	140,669	26.9%	8.030	0.174
Recorded history of:						
Prior Combined Comorbidity Raw Score	0.1	0.5	0.1	0.4	0.027	0.060
Cardiac Conditions	874	0.4%	1,749	0.3%	0.080	0.013
Cardiovascular and Metabolic Conditions	15,114	7.2%	24,388	4.7%	2.504	0.106
<i>Cerebral Palsy</i>	196	0.1%	139	0.0%	0.066	0.027
<i>Cystic Fibrosis</i>	40	0.0%	122	0.0%	-0.004	-0.003
Gynecological Conditions	83,566	39.7%	168,788	32.3%	7.348	0.154
Hypercoagulable States	103	0.0%	211	0.0%	0.008	0.004
Immobility Conditions	1,191	0.6%	2,219	0.4%	0.140	0.020
<i>Infection Diseases</i>	105	0.0%	218	0.0%	0.008	0.004
Inflammatory Conditions	5,690	2.7%	9,409	1.8%	0.899	0.061
Obesity and Overweight	6,579	3.1%	16,680	3.2%	-0.071	-0.004
Renal Conditions	216	0.1%	371	0.1%	0.031	0.011
<i>Sickle Cell Anemia</i>	27	0.0%	56	0.0%	0.002	0.002
Surgery	1,054	0.5%	1,944	0.4%	0.128	0.019
<i>Thoracic Outlet Syndrome</i>	206	0.1%	333	0.1%	0.034	0.012
Tobacco Use	5,087	2.4%	11,063	2.1%	0.296	0.020
Venous Catheterization	203	0.1%	335	0.1%	0.032	0.011
Health Service Utilization Intensity:						
Mean number of ambulatory encounters (AV)	4.8	6.2	3.6	5.1	1.160	0.204
Mean number of emergency room encounters (ED)	0.2	0.6	0.1	0.5	0.025	0.044
Mean number of inpatient hospital encounters (IP)	0.0	0.2	0.0	0.1	0.005	0.032
Mean number of non-acute institutional encounters (IS)	0.0	0.1	0.0	0.1	0.001	0.012
Mean number of other ambulatory encounters (OA)	0.8	2.2	0.9	2.0	-0.082	-0.039
Mean number of filled RX	7.0	8.2	4.5	6.0	2.517	0.350
Mean number of generics	3.3	3.3	2.4	2.7	0.931	0.308
Mean number of unique drug classes	3.1	3.0	2.3	2.5	0.871	0.317

¹ Covariates in italics were not included in the propensity score logistic regression model

² Value represents standard deviation where no % follows the value

Table 1b. Cohort of New Initiators of Continuous or Extended Combined Oral Contraceptives and Cyclic Combined Oral Contraceptives (VTE Broad Definition) (Matched, Aggregated), Ratio 1:1, Caliper = 0.01

Characteristic ¹	Medical Product				Covariate Balance	
	Continuous or Extended Combined Oral Contraceptives		Cyclic Combined Oral Contraceptives		Absolute Difference	Standardized Difference
	N/Mean	%/Std Dev ²	N/Mean	%/Std Dev ²		
Patients (N)	203,402	96.5%	203,402	38.9%	-	-
Demographics:						
Mean age	30.2	8.5	30.3	8.7	-0.113	-0.013
Age: 18-24	69,501	34.2%	69,236	34.0%	0.130	0.003
Age: 25-34	73,480	36.1%	73,965	36.4%	-0.238	-0.005
Age: 35-50	60,421	29.7%	60,201	29.6%	0.108	0.002
Gender (Female)	203,402	100.0%	203,402	100.0%	0.000	-
History of use:						
Other Study Combined Hormonal Contraceptive	4,241	2.1%	3,740	1.8%	0.246	0.018
Any Non-study Combined Hormonal Contraceptive	70,521	34.7%	71,700	35.3%	-0.580	-0.012
Recorded history of:						
Prior Combined Comorbidity Raw Score	0.1	0.5	0.1	0.5	0.002	0.005
Cardiac Conditions	832	0.4%	824	0.4%	0.004	0.001
Cardiovascular and Metabolic Conditions	13,827	6.8%	13,876	6.8%	-0.024	-0.001
<i>Cerebral Palsy</i>	186	0.1%	62	0.0%	0.061	0.025
<i>Cystic Fibrosis</i>	35	0.0%	64	0.0%	-0.014	-0.009
Gynecological Conditions	78,910	38.8%	79,509	39.1%	-0.294	-0.006
Hypercoagulable States	87	0.0%	89	0.0%	-0.001	-0.000
Immobility Conditions	1,095	0.5%	1,077	0.5%	0.009	0.001
<i>Infection Diseases</i>	93	0.0%	98	0.0%	-0.002	-0.001
Inflammatory Conditions	5,107	2.5%	4,995	2.5%	0.055	0.004
Obesity and Overweight	6,099	3.0%	6,025	3.0%	0.036	0.002
Renal Conditions	194	0.1%	182	0.1%	0.006	0.002
<i>Sickle Cell Anemia</i>	27	0.0%	26	0.0%	0.000	0.000
Surgery	932	0.5%	926	0.5%	0.003	0.000
<i>Thoracic Outlet Syndrome</i>	184	0.1%	184	0.1%	0.000	0.000
Tobacco Use	4,736	2.3%	4,730	2.3%	0.003	0.000
Venous Catheterization	176	0.1%	161	0.1%	0.007	0.003
Health Service Utilization Intensity:						
Mean number of ambulatory encounters (AV)	4.6	5.9	4.6	6.0	0.031	0.005
Mean number of emergency room encounters (ED)	0.2	0.6	0.2	0.6	0.002	0.003
Mean number of inpatient hospital encounters (IP)	0.0	0.2	0.0	0.2	0.000	0.003
Mean number of non-acute institutional encounters (IS)	0.0	0.1	0.0	0.1	0.000	0.001
Mean number of other ambulatory encounters (OA)	0.8	2.1	0.8	2.1	0.003	0.002
Mean number of filled RX	6.5	7.4	6.4	7.5	0.109	0.015
Mean number of generics	3.1	3.1	3.1	3.1	0.035	0.011
Mean number of unique drug classes	3.0	2.8	2.9	2.8	0.051	0.018

¹ Covariates in italics were not included in the propensity score logistic regression model

² Value represents standard deviation where no % follows the value

Table 2: Cohort Attrition and Exposure Episode Truncation due to Pregnancy (VTE Broad Definition)

Medical Product	Original Cohort	Number Remaining in Cohort after Pregnancy Exclusion	Percent Excluded from Cohort due to Pregnancy	Number of Episodes Censored due to Pregnancy	Percent of Episodes Censored due to Pregnancy
Continuous or Extended Combined Oral Contraceptives	223,307	210,691	5.65%	1,534	0.73%
Cyclic Combined Oral Contraceptives	567,003	522,316	7.88%	7,744	1.48%

Table 3: Effect Estimates for Continuous or Extended Combined Oral Contraceptives (COCs) and Cyclic COCs and Venous Thromboembolism (Broad Definition) by Analysis Type											
Medical Product	Number of New Users	Person Years at Risk	Average Person Days at Risk	Average Person Years at Risk	Number of Events	Incidence Rate per 1000 Person Years	Risk per 1000 New Users	Incidence Rate Difference per 1000 Person Years	Difference in Risk per 1000 New Users	Hazard Ratio (95% CI)	Wald P-Value
Unmatched Analysis (Site-adjusted only)											
Continuous or Extended COCs	210,691	147,719.98	256.08	0.70	353	2.39	1.68	1.02	0.74	1.76 (1.52, 2.04)	<.0001
Cyclic COCs	522,316	356,823.24	249.52	0.68	489	1.37	0.94				
1:1 Matched Unconditional Predefined Analysis; Caliper=0.01											
Continuous or Extended COCs	203,402	142,335.74	255.59	0.70	318	2.23	1.56	0.51	0.39	1.30 (1.10, 1.53)	0.0025
Cyclic COCs	203,402	138,055.25	247.91	0.68	238	1.72	1.17				

Dates of Available Data for Each Data Partner (DP) up to Request End Date (9/30/2015) as of Query Distribution Date

Data Partner (Masked)	Start Date	End Date
DP01	1/1/2008	9/30/2015
DP02	1/1/2012	9/30/2015
DP03	5/22/2007	9/30/2015
DP04	5/22/2007	9/30/2015
DP05	5/22/2007	9/30/2015
DP06	5/22/2007	9/30/2015
DP07	5/22/2007	5/31/2015
DP08	5/22/2007	10/31/2014
DP09	6/1/2007	9/30/2015
DP10	-	-
DP11	-	-
DP12	-	-
DP13	5/22/2007	9/30/2015
DP14	-	-
DP15	1/1/2008	9/30/2015
DP16	5/22/2007	9/30/2015

Appendix A: List of Generic and Brand Names used to Define Continuous and Extended Combined Oral Contraceptives

Generic Name	Brand Name	Continuous or Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	Camrese	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	Camrese Lo	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	L norgest/e.estradiol-e.estrad	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	Seasonique	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	LoSeasonique	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	Quartette	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	Amethia Lo	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	Amethia	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	Ashlyna	Extended
LEVONORGESTREL/ETHINYL ESTRADIOL AND ETHINYL ESTRADIOL	Daysee	Extended
LEVONORGESTREL-ETHINYL ESTRADIOL	levonorgestrel-ethinyl estrad	Extended
LEVONORGESTREL-ETHINYL ESTRADIOL	Jolessa	Extended
LEVONORGESTREL-ETHINYL ESTRADIOL	Introvale	Extended
LEVONORGESTREL-ETHINYL ESTRADIOL	Setlakin	Extended
LEVONORGESTREL-ETHINYL ESTRADIOL	Seasonale contraceptive	Extended
LEVONORGESTREL-ETHINYL ESTRADIOL	Quasense	Extended
LEVONORGESTREL-ETHINYL ESTRADIOL	Lybrel	Continuous
LEVONORGESTREL-ETHINYL ESTRADIOL	Amethyst	Continuous

Appendix B: List of Generic and Brand Names used to Define Cyclic Combined Oral Contraceptives

Generic Name	Brand Name
LEVONORGESTREL-ETHINYL ESTRADIOL	Triphasil (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Allesse (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	levonorgestrel-ethinyl estrad
LEVONORGESTREL-ETHINYL ESTRADIOL	Lessina
LEVONORGESTREL-ETHINYL ESTRADIOL	Portia
LEVONORGESTREL-ETHINYL ESTRADIOL	Aviane
LEVONORGESTREL-ETHINYL ESTRADIOL	Enpresse
LEVONORGESTREL-ETHINYL ESTRADIOL	Myzilra
LEVONORGESTREL-ETHINYL ESTRADIOL	Orsythia
LEVONORGESTREL-ETHINYL ESTRADIOL	Vienna
LEVONORGESTREL-ETHINYL ESTRADIOL	Altavera (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Levonest (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Falmina (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Lutera (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Trivora (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Levora-28
LEVONORGESTREL-ETHINYL ESTRADIOL	Aubra
LEVONORGESTREL-ETHINYL ESTRADIOL	Chateal
LEVONORGESTREL-ETHINYL ESTRADIOL	Levlite (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Levlen (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Tri-Levlen (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Nordette (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Delyla (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Sronyx
LEVONORGESTREL-ETHINYL ESTRADIOL	Levora 0.15/30 (28)
LEVONORGESTREL-ETHINYL ESTRADIOL	Marlissa
LEVONORGESTREL-ETHINYL ESTRADIOL	Nordette
LEVONORGESTREL-ETHINYL ESTRADIOL	Kurvelo
LEVONORGESTREL-ETHINYL ESTRADIOL	levonorg-eth estrad triphasic
LEVONORGESTREL-ETHINYL ESTRADIOL	Larissia

Appendix C: List of Generic and Brand Names Used to Define Anticoagulant Use Exclusion

Generic Name	Brand Name
APIXABAN	Eliquis
FONDAPARINUX SODIUM	Arixtra
ARGATROBAN	argatroban
DALTEPARIN SODIUM,PORCINE	Fragmin
WARFARIN SODIUM	Coumadin
HEPARIN SODIUM,PORCINE/PF	heparin, porcine (PF)
HEPARIN SODIUM,PORCINE	heparin (porcine)
HEPARIN SODIUM,PORCINE	heparin lock flush (porcine)
HEPARIN SODIUM,PORCINE/DEXTROSE 5 % IN WATER	heparin (porcine) in 5 % dex
ENOXAPARIN SODIUM	Lovenox
WARFARIN SODIUM	warfarin
DESIRUDIN	Iprivask
HEPARIN SODIUM,PORCINE IN 0.9 % SODIUM CHLORIDE/PF	heparin (porcine) in NaCl (PF)
HEPARIN SODIUM,PORCINE	Heparin Lock
HEPARIN SODIUM,PORCINE	heparin lock flush
HEPARIN SODIUM,PORCINE IN 0.45 % SODIUM CHLORIDE	heparin(porcine) in 0.45% NaCl
BIVALIRUDIN	bivalirudin
ENOXAPARIN SODIUM	enoxaparin
DABIGATRAN ETEXILATE MESYLATE	Pradaxa
HEPARIN SODIUM,PORCINE/PF	Hep-Lock U/P PF
HEPARIN SODIUM,PORCINE	Hep-Lock Flush
HEPARIN SODIUM,PORCINE	Hep-Lock
ARGATROBAN IN 0.9 % SODIUM CHLORIDE	argatroban in 0.9 % sod chlor
ARGATROBAN IN SODIUM CHLORIDE, ISO-OSMOTIC	argatroban in NaCl (iso-os)
WARFARIN SODIUM	Jantoven
HEPARIN SODIUM,PORCINE/PF	Heparin LockFlush(Porcine)(PF)
HEPARIN SODIUM,PORCINE IN 0.9 % SODIUM CHLORIDE	Heparin Flush
HEPARIN SODIUM,PORCINE IN 0.9 % SODIUM CHLORIDE	heparin flush(porcine)-0.9NaCl
HEPARIN SODIUM,PORCINE/PF	Monoject Prefill Advanced (PF)
HEPARIN SODIUM,PORCINE/PF	Monoject Prefill (PF)
HEPARIN SODIUM,PORCINE/DEXTROSE 5 % IN WATER/PF	heparin (porcine) in D5W (PF)
RIVAROXABAN	Xarelto
HEPARIN SODIUM,PORCINE	heparin (porcine) (bulk)
WARFARIN SODIUM	warfarin (bulk)
TINZAPARIN SODIUM,PORCINE	Innohep
LEPIRUDIN,RECOMBINANT	Refludan
DICUMAROL	dicumarol (bulk)

Appendix C: List of Generic and Brand Names Used to Define Anticoagulant Use Exclusion

Generic Name	Brand Name
ANISINDIONE	anisindione (bulk)
PHENINDIONE	phenindione (bulk)
HEPARIN SODIUM,PORCINE IN 0.9 % SODIUM CHLORIDE	heparin (porcine) in 0.9% NaCl
FONDAPARINUX SODIUM	fondaparinux
HEPARIN SODIUM,PORCINE/PF	Hep Flush-10 (PF)
BIVALIRUDIN	Angiomax
EDOXYBAN TOSYLATE	Savaysa

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	99.25	Procedure	ICD-9-CM	Injection or infusion of cancer chemotherapeutic substance
Cancer or chemotherapy/radiation	140	Diagnosis	ICD-9-CM	Malignant neoplasm of lip
Cancer or chemotherapy/radiation	140.0	Diagnosis	ICD-9-CM	Malignant neoplasm of upper lip, vermilion border
Cancer or chemotherapy/radiation	140.1	Diagnosis	ICD-9-CM	Malignant neoplasm of lower lip, vermilion border
Cancer or chemotherapy/radiation	140.3	Diagnosis	ICD-9-CM	Malignant neoplasm of upper lip, inner aspect
Cancer or chemotherapy/radiation	140.4	Diagnosis	ICD-9-CM	Malignant neoplasm of lower lip, inner aspect
Cancer or chemotherapy/radiation	140.5	Diagnosis	ICD-9-CM	Malignant neoplasm of lip, inner aspect, unspecified as to upper or lower
Cancer or chemotherapy/radiation	140.6	Diagnosis	ICD-9-CM	Malignant neoplasm of commissure of lip
Cancer or chemotherapy/radiation	140.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites of lip
Cancer or chemotherapy/radiation	140.9	Diagnosis	ICD-9-CM	Malignant neoplasm of lip, vermilion border, unspecified as to upper or lower
Cancer or chemotherapy/radiation	141.0	Diagnosis	ICD-9-CM	Malignant neoplasm of base of tongue
Cancer or chemotherapy/radiation	141	Diagnosis	ICD-9-CM	Malignant neoplasm of tongue
Cancer or chemotherapy/radiation	141.1	Diagnosis	ICD-9-CM	Malignant neoplasm of dorsal surface of tongue
Cancer or chemotherapy/radiation	141.2	Diagnosis	ICD-9-CM	Malignant neoplasm of tip and lateral border of tongue
Cancer or chemotherapy/radiation	141.3	Diagnosis	ICD-9-CM	Malignant neoplasm of ventral surface of tongue
Cancer or chemotherapy/radiation	141.4	Diagnosis	ICD-9-CM	Malignant neoplasm of anterior two-thirds of tongue, part unspecified
Cancer or chemotherapy/radiation	141.5	Diagnosis	ICD-9-CM	Malignant neoplasm of junctional zone of tongue
Cancer or chemotherapy/radiation	141.6	Diagnosis	ICD-9-CM	Malignant neoplasm of lingual tonsil
Cancer or chemotherapy/radiation	141.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites of tongue
Cancer or chemotherapy/radiation	141.9	Diagnosis	ICD-9-CM	Malignant neoplasm of tongue, unspecified site
Cancer or chemotherapy/radiation	142	Diagnosis	ICD-9-CM	Malignant neoplasm of major salivary glands
Cancer or chemotherapy/radiation	142.0	Diagnosis	ICD-9-CM	Malignant neoplasm of parotid gland
Cancer or chemotherapy/radiation	142.1	Diagnosis	ICD-9-CM	Malignant neoplasm of submandibular gland
Cancer or chemotherapy/radiation	142.2	Diagnosis	ICD-9-CM	Malignant neoplasm of sublingual gland
Cancer or chemotherapy/radiation	142.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other major salivary glands
Cancer or chemotherapy/radiation	142.9	Diagnosis	ICD-9-CM	Malignant neoplasm of salivary gland, unspecified
Cancer or chemotherapy/radiation	143	Diagnosis	ICD-9-CM	Malignant neoplasm of gum
Cancer or chemotherapy/radiation	143.0	Diagnosis	ICD-9-CM	Malignant neoplasm of upper gum
Cancer or chemotherapy/radiation	143.1	Diagnosis	ICD-9-CM	Malignant neoplasm of lower gum
Cancer or chemotherapy/radiation	143.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites of gum
Cancer or chemotherapy/radiation	143.9	Diagnosis	ICD-9-CM	Malignant neoplasm of gum, unspecified site
Cancer or chemotherapy/radiation	144.0	Diagnosis	ICD-9-CM	Malignant neoplasm of anterior portion of floor of mouth
Cancer or chemotherapy/radiation	144	Diagnosis	ICD-9-CM	Malignant neoplasm of floor of mouth
Cancer or chemotherapy/radiation	144.1	Diagnosis	ICD-9-CM	Malignant neoplasm of lateral portion of floor of mouth
Cancer or chemotherapy/radiation	144.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites of floor of mouth
Cancer or chemotherapy/radiation	144.9	Diagnosis	ICD-9-CM	Malignant neoplasm of floor of mouth, part unspecified
Cancer or chemotherapy/radiation	145.0	Diagnosis	ICD-9-CM	Malignant neoplasm of cheek mucosa

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	145	Diagnosis	ICD-9-CM	Malignant neoplasm of other and unspecified parts of mouth
Cancer or chemotherapy/radiation	145.1	Diagnosis	ICD-9-CM	Malignant neoplasm of vestibule of mouth
Cancer or chemotherapy/radiation	145.2	Diagnosis	ICD-9-CM	Malignant neoplasm of hard palate
Cancer or chemotherapy/radiation	145.3	Diagnosis	ICD-9-CM	Malignant neoplasm of soft palate
Cancer or chemotherapy/radiation	145.4	Diagnosis	ICD-9-CM	Malignant neoplasm of uvula
Cancer or chemotherapy/radiation	145.5	Diagnosis	ICD-9-CM	Malignant neoplasm of palate, unspecified
Cancer or chemotherapy/radiation	145.6	Diagnosis	ICD-9-CM	Malignant neoplasm of retromolar area
Cancer or chemotherapy/radiation	145.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified parts of mouth
Cancer or chemotherapy/radiation	145.9	Diagnosis	ICD-9-CM	Malignant neoplasm of mouth, unspecified site
Cancer or chemotherapy/radiation	146	Diagnosis	ICD-9-CM	Malignant neoplasm of oropharynx
Cancer or chemotherapy/radiation	146.0	Diagnosis	ICD-9-CM	Malignant neoplasm of tonsil
Cancer or chemotherapy/radiation	146.1	Diagnosis	ICD-9-CM	Malignant neoplasm of tonsillar fossa
Cancer or chemotherapy/radiation	146.2	Diagnosis	ICD-9-CM	Malignant neoplasm of tonsillar pillars (anterior) (posterior)
Cancer or chemotherapy/radiation	146.3	Diagnosis	ICD-9-CM	Malignant neoplasm of vallecula
Cancer or chemotherapy/radiation	146.4	Diagnosis	ICD-9-CM	Malignant neoplasm of anterior aspect of epiglottis
Cancer or chemotherapy/radiation	146.5	Diagnosis	ICD-9-CM	Malignant neoplasm of junctional region of oropharynx
Cancer or chemotherapy/radiation	146.6	Diagnosis	ICD-9-CM	Malignant neoplasm of lateral wall of oropharynx
Cancer or chemotherapy/radiation	146.7	Diagnosis	ICD-9-CM	Malignant neoplasm of posterior wall of oropharynx
Cancer or chemotherapy/radiation	146.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of oropharynx
Cancer or chemotherapy/radiation	146.9	Diagnosis	ICD-9-CM	Malignant neoplasm of oropharynx, unspecified site
Cancer or chemotherapy/radiation	147	Diagnosis	ICD-9-CM	Malignant neoplasm of nasopharynx
Cancer or chemotherapy/radiation	147.0	Diagnosis	ICD-9-CM	Malignant neoplasm of superior wall of nasopharynx
Cancer or chemotherapy/radiation	147.1	Diagnosis	ICD-9-CM	Malignant neoplasm of posterior wall of nasopharynx
Cancer or chemotherapy/radiation	147.2	Diagnosis	ICD-9-CM	Malignant neoplasm of lateral wall of nasopharynx
Cancer or chemotherapy/radiation	147.3	Diagnosis	ICD-9-CM	Malignant neoplasm of anterior wall of nasopharynx
Cancer or chemotherapy/radiation	147.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of nasopharynx
Cancer or chemotherapy/radiation	147.9	Diagnosis	ICD-9-CM	Malignant neoplasm of nasopharynx, unspecified site
Cancer or chemotherapy/radiation	148.0	Diagnosis	ICD-9-CM	Malignant neoplasm of postcricoid region of hypopharynx
Cancer or chemotherapy/radiation	148	Diagnosis	ICD-9-CM	Malignant neoplasm of hypopharynx
Cancer or chemotherapy/radiation	148.1	Diagnosis	ICD-9-CM	Malignant neoplasm of pyriform sinus
Cancer or chemotherapy/radiation	148.2	Diagnosis	ICD-9-CM	Malignant neoplasm of aryepiglottic fold, hypopharyngeal aspect
Cancer or chemotherapy/radiation	148.3	Diagnosis	ICD-9-CM	Malignant neoplasm of posterior hypopharyngeal wall
Cancer or chemotherapy/radiation	148.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of hypopharynx
Cancer or chemotherapy/radiation	148.9	Diagnosis	ICD-9-CM	Malignant neoplasm of hypopharynx, unspecified site
Cancer or chemotherapy/radiation	149	Diagnosis	ICD-9-CM	Malignant neoplasm of other and ill-defined sites within the lip, oral cavity, and pharynx
Cancer or chemotherapy/radiation	149.0	Diagnosis	ICD-9-CM	Malignant neoplasm of pharynx, unspecified
Cancer or chemotherapy/radiation	149.1	Diagnosis	ICD-9-CM	Malignant neoplasm of Waldeyer's ring

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	149.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites within the lip and oral cavity
Cancer or chemotherapy/radiation	149.9	Diagnosis	ICD-9-CM	Malignant neoplasm of ill-defined sites of lip and oral cavity
Cancer or chemotherapy/radiation	150.0	Diagnosis	ICD-9-CM	Malignant neoplasm of cervical esophagus
Cancer or chemotherapy/radiation	150	Diagnosis	ICD-9-CM	Malignant neoplasm of esophagus
Cancer or chemotherapy/radiation	150.1	Diagnosis	ICD-9-CM	Malignant neoplasm of thoracic esophagus
Cancer or chemotherapy/radiation	150.2	Diagnosis	ICD-9-CM	Malignant neoplasm of abdominal esophagus
Cancer or chemotherapy/radiation	150.3	Diagnosis	ICD-9-CM	Malignant neoplasm of upper third of esophagus
Cancer or chemotherapy/radiation	150.4	Diagnosis	ICD-9-CM	Malignant neoplasm of middle third of esophagus
Cancer or chemotherapy/radiation	150.5	Diagnosis	ICD-9-CM	Malignant neoplasm of lower third of esophagus
Cancer or chemotherapy/radiation	150.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified part of esophagus
Cancer or chemotherapy/radiation	150.9	Diagnosis	ICD-9-CM	Malignant neoplasm of esophagus, unspecified site
Cancer or chemotherapy/radiation	151.0	Diagnosis	ICD-9-CM	Malignant neoplasm of cardia
Cancer or chemotherapy/radiation	151	Diagnosis	ICD-9-CM	Malignant neoplasm of stomach
Cancer or chemotherapy/radiation	151.1	Diagnosis	ICD-9-CM	Malignant neoplasm of pylorus
Cancer or chemotherapy/radiation	151.2	Diagnosis	ICD-9-CM	Malignant neoplasm of pyloric antrum
Cancer or chemotherapy/radiation	151.3	Diagnosis	ICD-9-CM	Malignant neoplasm of fundus of stomach
Cancer or chemotherapy/radiation	151.4	Diagnosis	ICD-9-CM	Malignant neoplasm of body of stomach
Cancer or chemotherapy/radiation	151.5	Diagnosis	ICD-9-CM	Malignant neoplasm of lesser curvature of stomach, unspecified
Cancer or chemotherapy/radiation	151.6	Diagnosis	ICD-9-CM	Malignant neoplasm of greater curvature of stomach, unspecified
Cancer or chemotherapy/radiation	151.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of stomach
Cancer or chemotherapy/radiation	151.9	Diagnosis	ICD-9-CM	Malignant neoplasm of stomach, unspecified site
Cancer or chemotherapy/radiation	152	Diagnosis	ICD-9-CM	Malignant neoplasm of small intestine, including duodenum
Cancer or chemotherapy/radiation	152.0	Diagnosis	ICD-9-CM	Malignant neoplasm of duodenum
Cancer or chemotherapy/radiation	152.1	Diagnosis	ICD-9-CM	Malignant neoplasm of jejunum
Cancer or chemotherapy/radiation	152.2	Diagnosis	ICD-9-CM	Malignant neoplasm of ileum
Cancer or chemotherapy/radiation	152.3	Diagnosis	ICD-9-CM	Malignant neoplasm of Meckel's diverticulum
Cancer or chemotherapy/radiation	152.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of small intestine
Cancer or chemotherapy/radiation	152.9	Diagnosis	ICD-9-CM	Malignant neoplasm of small intestine, unspecified site
Cancer or chemotherapy/radiation	153	Diagnosis	ICD-9-CM	Malignant neoplasm of colon
Cancer or chemotherapy/radiation	153.0	Diagnosis	ICD-9-CM	Malignant neoplasm of hepatic flexure
Cancer or chemotherapy/radiation	153.1	Diagnosis	ICD-9-CM	Malignant neoplasm of transverse colon
Cancer or chemotherapy/radiation	153.2	Diagnosis	ICD-9-CM	Malignant neoplasm of descending colon
Cancer or chemotherapy/radiation	153.3	Diagnosis	ICD-9-CM	Malignant neoplasm of sigmoid colon
Cancer or chemotherapy/radiation	153.4	Diagnosis	ICD-9-CM	Malignant neoplasm of cecum
Cancer or chemotherapy/radiation	153.5	Diagnosis	ICD-9-CM	Malignant neoplasm of appendix
Cancer or chemotherapy/radiation	153.6	Diagnosis	ICD-9-CM	Malignant neoplasm of ascending colon
Cancer or chemotherapy/radiation	153.7	Diagnosis	ICD-9-CM	Malignant neoplasm of splenic flexure

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	153.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of large intestine
Cancer or chemotherapy/radiation	153.9	Diagnosis	ICD-9-CM	Malignant neoplasm of colon, unspecified site
Cancer or chemotherapy/radiation	154	Diagnosis	ICD-9-CM	Malignant neoplasm of rectum, rectosigmoid junction, and anus
Cancer or chemotherapy/radiation	154.0	Diagnosis	ICD-9-CM	Malignant neoplasm of rectosigmoid junction
Cancer or chemotherapy/radiation	154.1	Diagnosis	ICD-9-CM	Malignant neoplasm of rectum
Cancer or chemotherapy/radiation	154.2	Diagnosis	ICD-9-CM	Malignant neoplasm of anal canal
Cancer or chemotherapy/radiation	154.3	Diagnosis	ICD-9-CM	Malignant neoplasm of anus, unspecified site
Cancer or chemotherapy/radiation	154.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites of rectum, rectosigmoid junction, and anus
Cancer or chemotherapy/radiation	155	Diagnosis	ICD-9-CM	Malignant neoplasm of liver and intrahepatic bile ducts
Cancer or chemotherapy/radiation	155.0	Diagnosis	ICD-9-CM	Malignant neoplasm of liver, primary
Cancer or chemotherapy/radiation	155.1	Diagnosis	ICD-9-CM	Malignant neoplasm of intrahepatic bile ducts
Cancer or chemotherapy/radiation	155.2	Diagnosis	ICD-9-CM	Malignant neoplasm of liver, not specified as primary or secondary
Cancer or chemotherapy/radiation	156	Diagnosis	ICD-9-CM	Malignant neoplasm of gallbladder and extrahepatic bile ducts
Cancer or chemotherapy/radiation	156.0	Diagnosis	ICD-9-CM	Malignant neoplasm of gallbladder
Cancer or chemotherapy/radiation	156.1	Diagnosis	ICD-9-CM	Malignant neoplasm of extrahepatic bile ducts
Cancer or chemotherapy/radiation	156.2	Diagnosis	ICD-9-CM	Malignant neoplasm of ampulla of Vater
Cancer or chemotherapy/radiation	156.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of gallbladder and extrahepatic bile ducts
Cancer or chemotherapy/radiation	156.9	Diagnosis	ICD-9-CM	Malignant neoplasm of biliary tract, part unspecified site
Cancer or chemotherapy/radiation	157.0	Diagnosis	ICD-9-CM	Malignant neoplasm of head of pancreas
Cancer or chemotherapy/radiation	157	Diagnosis	ICD-9-CM	Malignant neoplasm of pancreas
Cancer or chemotherapy/radiation	157.1	Diagnosis	ICD-9-CM	Malignant neoplasm of body of pancreas
Cancer or chemotherapy/radiation	157.2	Diagnosis	ICD-9-CM	Malignant neoplasm of tail of pancreas
Cancer or chemotherapy/radiation	157.3	Diagnosis	ICD-9-CM	Malignant neoplasm of pancreatic duct
Cancer or chemotherapy/radiation	157.4	Diagnosis	ICD-9-CM	Malignant neoplasm of islets of Langerhans
Cancer or chemotherapy/radiation	157.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of pancreas
Cancer or chemotherapy/radiation	157.9	Diagnosis	ICD-9-CM	Malignant neoplasm of pancreas, part unspecified
Cancer or chemotherapy/radiation	158.0	Diagnosis	ICD-9-CM	Malignant neoplasm of retroperitoneum
Cancer or chemotherapy/radiation	158	Diagnosis	ICD-9-CM	Malignant neoplasm of retroperitoneum and peritoneum
Cancer or chemotherapy/radiation	158.8	Diagnosis	ICD-9-CM	Malignant neoplasm of specified parts of peritoneum
Cancer or chemotherapy/radiation	158.9	Diagnosis	ICD-9-CM	Malignant neoplasm of peritoneum, unspecified
Cancer or chemotherapy/radiation	159	Diagnosis	ICD-9-CM	Malignant neoplasm of other and ill-defined sites within the digestive organs and peritoneum
Cancer or chemotherapy/radiation	159.0	Diagnosis	ICD-9-CM	Malignant neoplasm of intestinal tract, part unspecified
Cancer or chemotherapy/radiation	159.1	Diagnosis	ICD-9-CM	Malignant neoplasm of spleen, not elsewhere classified
Cancer or chemotherapy/radiation	159.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites of digestive system and intra-abdominal organs
Cancer or chemotherapy/radiation	159.9	Diagnosis	ICD-9-CM	Malignant neoplasm of ill-defined sites of digestive organs and peritoneum
Cancer or chemotherapy/radiation	160	Diagnosis	ICD-9-CM	Malignant neoplasm of nasal cavities, middle ear, and accessory sinuses
Cancer or chemotherapy/radiation	160.0	Diagnosis	ICD-9-CM	Malignant neoplasm of nasal cavities

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	160.1	Diagnosis	ICD-9-CM	Malignant neoplasm of auditory tube, middle ear, and mastoid air cells
Cancer or chemotherapy/radiation	160.2	Diagnosis	ICD-9-CM	Malignant neoplasm of maxillary sinus
Cancer or chemotherapy/radiation	160.3	Diagnosis	ICD-9-CM	Malignant neoplasm of ethmoidal sinus
Cancer or chemotherapy/radiation	160.4	Diagnosis	ICD-9-CM	Malignant neoplasm of frontal sinus
Cancer or chemotherapy/radiation	160.5	Diagnosis	ICD-9-CM	Malignant neoplasm of sphenoidal sinus
Cancer or chemotherapy/radiation	160.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites of nasal cavities, middle ear, and accessory sinuses
Cancer or chemotherapy/radiation	160.9	Diagnosis	ICD-9-CM	Malignant neoplasm of site of nasal cavities, middle ear, and accessory sinus, unspecified site
Cancer or chemotherapy/radiation	161.0	Diagnosis	ICD-9-CM	Malignant neoplasm of glottis
Cancer or chemotherapy/radiation	161	Diagnosis	ICD-9-CM	Malignant neoplasm of larynx
Cancer or chemotherapy/radiation	161.1	Diagnosis	ICD-9-CM	Malignant neoplasm of supraglottis
Cancer or chemotherapy/radiation	161.2	Diagnosis	ICD-9-CM	Malignant neoplasm of subglottis
Cancer or chemotherapy/radiation	161.3	Diagnosis	ICD-9-CM	Malignant neoplasm of laryngeal cartilages
Cancer or chemotherapy/radiation	161.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of larynx
Cancer or chemotherapy/radiation	161.9	Diagnosis	ICD-9-CM	Malignant neoplasm of larynx, unspecified site
Cancer or chemotherapy/radiation	162.0	Diagnosis	ICD-9-CM	Malignant neoplasm of trachea
Cancer or chemotherapy/radiation	162	Diagnosis	ICD-9-CM	Malignant neoplasm of trachea, bronchus, and lung
Cancer or chemotherapy/radiation	162.2	Diagnosis	ICD-9-CM	Malignant neoplasm of main bronchus
Cancer or chemotherapy/radiation	162.3	Diagnosis	ICD-9-CM	Malignant neoplasm of upper lobe, bronchus, or lung
Cancer or chemotherapy/radiation	162.4	Diagnosis	ICD-9-CM	Malignant neoplasm of middle lobe, bronchus, or lung
Cancer or chemotherapy/radiation	162.5	Diagnosis	ICD-9-CM	Malignant neoplasm of lower lobe, bronchus, or lung
Cancer or chemotherapy/radiation	162.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other parts of bronchus or lung
Cancer or chemotherapy/radiation	162.9	Diagnosis	ICD-9-CM	Malignant neoplasm of bronchus and lung, unspecified site
Cancer or chemotherapy/radiation	163.0	Diagnosis	ICD-9-CM	Malignant neoplasm of parietal pleura
Cancer or chemotherapy/radiation	163	Diagnosis	ICD-9-CM	Malignant neoplasm of pleura
Cancer or chemotherapy/radiation	163.1	Diagnosis	ICD-9-CM	Malignant neoplasm of visceral pleura
Cancer or chemotherapy/radiation	163.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of pleura
Cancer or chemotherapy/radiation	163.9	Diagnosis	ICD-9-CM	Malignant neoplasm of pleura, unspecified site
Cancer or chemotherapy/radiation	164.0	Diagnosis	ICD-9-CM	Malignant neoplasm of thymus
Cancer or chemotherapy/radiation	164	Diagnosis	ICD-9-CM	Malignant neoplasm of thymus, heart, and mediastinum
Cancer or chemotherapy/radiation	164.1	Diagnosis	ICD-9-CM	Malignant neoplasm of heart
Cancer or chemotherapy/radiation	164.2	Diagnosis	ICD-9-CM	Malignant neoplasm of anterior mediastinum
Cancer or chemotherapy/radiation	164.3	Diagnosis	ICD-9-CM	Malignant neoplasm of posterior mediastinum
Cancer or chemotherapy/radiation	164.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other parts of mediastinum
Cancer or chemotherapy/radiation	164.9	Diagnosis	ICD-9-CM	Malignant neoplasm of mediastinum, part unspecified
Cancer or chemotherapy/radiation	165	Diagnosis	ICD-9-CM	Malignant neoplasm of other and ill-defined sites within the respiratory system and
Cancer or chemotherapy/radiation	165.0	Diagnosis	ICD-9-CM	Malignant neoplasm of upper respiratory tract, part unspecified
Cancer or chemotherapy/radiation	165.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other sites within the respiratory system and intrathoracic organs

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	165.9	Diagnosis	ICD-9-CM	Malignant neoplasm of ill-defined sites within the respiratory system
Cancer or chemotherapy/radiation	170.0	Diagnosis	ICD-9-CM	Malignant neoplasm of bones of skull and face, except mandible
Cancer or chemotherapy/radiation	170	Diagnosis	ICD-9-CM	Malignant neoplasm of bone and articular cartilage
Cancer or chemotherapy/radiation	170.1	Diagnosis	ICD-9-CM	Malignant neoplasm of mandible
Cancer or chemotherapy/radiation	170.2	Diagnosis	ICD-9-CM	Malignant neoplasm of vertebral column, excluding sacrum and coccyx
Cancer or chemotherapy/radiation	170.3	Diagnosis	ICD-9-CM	Malignant neoplasm of ribs, sternum, and clavicle
Cancer or chemotherapy/radiation	170.4	Diagnosis	ICD-9-CM	Malignant neoplasm of scapula and long bones of upper limb
Cancer or chemotherapy/radiation	170.5	Diagnosis	ICD-9-CM	Malignant neoplasm of short bones of upper limb
Cancer or chemotherapy/radiation	170.6	Diagnosis	ICD-9-CM	Malignant neoplasm of pelvic bones, sacrum, and coccyx
Cancer or chemotherapy/radiation	170.7	Diagnosis	ICD-9-CM	Malignant neoplasm of long bones of lower limb
Cancer or chemotherapy/radiation	170.8	Diagnosis	ICD-9-CM	Malignant neoplasm of short bones of lower limb
Cancer or chemotherapy/radiation	170.9	Diagnosis	ICD-9-CM	Malignant neoplasm of bone and articular cartilage, site unspecified
Cancer or chemotherapy/radiation	171.0	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue of head, face, and neck
Cancer or chemotherapy/radiation	171	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue
Cancer or chemotherapy/radiation	171.2	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue of upper limb, including shoulder
Cancer or chemotherapy/radiation	171.3	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue of lower limb, including hip
Cancer or chemotherapy/radiation	171.4	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue of thorax
Cancer or chemotherapy/radiation	171.5	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue of abdomen
Cancer or chemotherapy/radiation	171.6	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue of pelvis
Cancer or chemotherapy/radiation	171.7	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue of trunk, unspecified site
Cancer or chemotherapy/radiation	171.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of connective and other soft tissue
Cancer or chemotherapy/radiation	171.9	Diagnosis	ICD-9-CM	Malignant neoplasm of connective and other soft tissue, site unspecified
Cancer or chemotherapy/radiation	174.0	Diagnosis	ICD-9-CM	Malignant neoplasm of nipple and areola of female breast
Cancer or chemotherapy/radiation	174	Diagnosis	ICD-9-CM	Malignant neoplasm of female breast
Cancer or chemotherapy/radiation	174.1	Diagnosis	ICD-9-CM	Malignant neoplasm of central portion of female breast
Cancer or chemotherapy/radiation	174.2	Diagnosis	ICD-9-CM	Malignant neoplasm of upper-inner quadrant of female breast
Cancer or chemotherapy/radiation	174.3	Diagnosis	ICD-9-CM	Malignant neoplasm of lower-inner quadrant of female breast
Cancer or chemotherapy/radiation	174.4	Diagnosis	ICD-9-CM	Malignant neoplasm of upper-outer quadrant of female breast
Cancer or chemotherapy/radiation	174.5	Diagnosis	ICD-9-CM	Malignant neoplasm of lower-outer quadrant of female breast
Cancer or chemotherapy/radiation	174.6	Diagnosis	ICD-9-CM	Malignant neoplasm of axillary tail of female breast
Cancer or chemotherapy/radiation	174.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of female breast
Cancer or chemotherapy/radiation	174.9	Diagnosis	ICD-9-CM	Malignant neoplasm of breast (female), unspecified site
Cancer or chemotherapy/radiation	175.0	Diagnosis	ICD-9-CM	Malignant neoplasm of nipple and areola of male breast
Cancer or chemotherapy/radiation	175	Diagnosis	ICD-9-CM	Malignant neoplasm of male breast
Cancer or chemotherapy/radiation	175.9	Diagnosis	ICD-9-CM	Malignant neoplasm of other and unspecified sites of male breast
Cancer or chemotherapy/radiation	176	Diagnosis	ICD-9-CM	Kaposi's sarcoma
Cancer or chemotherapy/radiation	176.0	Diagnosis	ICD-9-CM	Kaposi's sarcoma of skin

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	176.1	Diagnosis	ICD-9-CM	Kaposi's sarcoma of soft tissue
Cancer or chemotherapy/radiation	176.2	Diagnosis	ICD-9-CM	Kaposi's sarcoma of palate
Cancer or chemotherapy/radiation	176.3	Diagnosis	ICD-9-CM	Kaposi's sarcoma of gastrointestinal sites
Cancer or chemotherapy/radiation	176.4	Diagnosis	ICD-9-CM	Kaposi's sarcoma of lung
Cancer or chemotherapy/radiation	176.5	Diagnosis	ICD-9-CM	Kaposi's sarcoma of lymph nodes
Cancer or chemotherapy/radiation	176.8	Diagnosis	ICD-9-CM	Kaposi's sarcoma of other specified sites
Cancer or chemotherapy/radiation	176.9	Diagnosis	ICD-9-CM	Kaposi's sarcoma of unspecified site
Cancer or chemotherapy/radiation	179	Diagnosis	ICD-9-CM	Malignant neoplasm of uterus, part unspecified
Cancer or chemotherapy/radiation	180	Diagnosis	ICD-9-CM	Malignant neoplasm of cervix uteri
Cancer or chemotherapy/radiation	180.0	Diagnosis	ICD-9-CM	Malignant neoplasm of endocervix
Cancer or chemotherapy/radiation	180.1	Diagnosis	ICD-9-CM	Malignant neoplasm of exocervix
Cancer or chemotherapy/radiation	180.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of cervix
Cancer or chemotherapy/radiation	180.9	Diagnosis	ICD-9-CM	Malignant neoplasm of cervix uteri, unspecified site
Cancer or chemotherapy/radiation	181	Diagnosis	ICD-9-CM	Malignant neoplasm of placenta
Cancer or chemotherapy/radiation	182.0	Diagnosis	ICD-9-CM	Malignant neoplasm of corpus uteri, except isthmus
Cancer or chemotherapy/radiation	182	Diagnosis	ICD-9-CM	Malignant neoplasm of body of uterus
Cancer or chemotherapy/radiation	182.1	Diagnosis	ICD-9-CM	Malignant neoplasm of isthmus
Cancer or chemotherapy/radiation	182.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of body of uterus
Cancer or chemotherapy/radiation	183.0	Diagnosis	ICD-9-CM	Malignant neoplasm of ovary
Cancer or chemotherapy/radiation	183	Diagnosis	ICD-9-CM	Malignant neoplasm of ovary and other uterine adnexa
Cancer or chemotherapy/radiation	183.2	Diagnosis	ICD-9-CM	Malignant neoplasm of fallopian tube
Cancer or chemotherapy/radiation	183.3	Diagnosis	ICD-9-CM	Malignant neoplasm of broad ligament of uterus
Cancer or chemotherapy/radiation	183.4	Diagnosis	ICD-9-CM	Malignant neoplasm of parametrium of uterus
Cancer or chemotherapy/radiation	183.5	Diagnosis	ICD-9-CM	Malignant neoplasm of round ligament of uterus
Cancer or chemotherapy/radiation	183.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of uterine adnexa
Cancer or chemotherapy/radiation	183.9	Diagnosis	ICD-9-CM	Malignant neoplasm of uterine adnexa, unspecified site
Cancer or chemotherapy/radiation	184	Diagnosis	ICD-9-CM	Malignant neoplasm of other and unspecified female genital organs
Cancer or chemotherapy/radiation	184.0	Diagnosis	ICD-9-CM	Malignant neoplasm of vagina
Cancer or chemotherapy/radiation	184.1	Diagnosis	ICD-9-CM	Malignant neoplasm of labia majora
Cancer or chemotherapy/radiation	184.2	Diagnosis	ICD-9-CM	Malignant neoplasm of labia minora
Cancer or chemotherapy/radiation	184.3	Diagnosis	ICD-9-CM	Malignant neoplasm of clitoris
Cancer or chemotherapy/radiation	184.4	Diagnosis	ICD-9-CM	Malignant neoplasm of vulva, unspecified site
Cancer or chemotherapy/radiation	184.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of female genital organs
Cancer or chemotherapy/radiation	184.9	Diagnosis	ICD-9-CM	Malignant neoplasm of female genital organ, site unspecified
Cancer or chemotherapy/radiation	185	Diagnosis	ICD-9-CM	Malignant neoplasm of prostate
Cancer or chemotherapy/radiation	186	Diagnosis	ICD-9-CM	Malignant neoplasm of testis
Cancer or chemotherapy/radiation	186.0	Diagnosis	ICD-9-CM	Malignant neoplasm of undescended testis

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	186.9	Diagnosis	ICD-9-CM	Malignant neoplasm of other and unspecified testis
Cancer or chemotherapy/radiation	187	Diagnosis	ICD-9-CM	Malignant neoplasm of penis and other male genital organs
Cancer or chemotherapy/radiation	187.1	Diagnosis	ICD-9-CM	Malignant neoplasm of prepuce
Cancer or chemotherapy/radiation	187.2	Diagnosis	ICD-9-CM	Malignant neoplasm of glans penis
Cancer or chemotherapy/radiation	187.3	Diagnosis	ICD-9-CM	Malignant neoplasm of body of penis
Cancer or chemotherapy/radiation	187.4	Diagnosis	ICD-9-CM	Malignant neoplasm of penis, part unspecified
Cancer or chemotherapy/radiation	187.5	Diagnosis	ICD-9-CM	Malignant neoplasm of epididymis
Cancer or chemotherapy/radiation	187.6	Diagnosis	ICD-9-CM	Malignant neoplasm of spermatic cord
Cancer or chemotherapy/radiation	187.7	Diagnosis	ICD-9-CM	Malignant neoplasm of scrotum
Cancer or chemotherapy/radiation	187.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of male genital organs
Cancer or chemotherapy/radiation	187.9	Diagnosis	ICD-9-CM	Malignant neoplasm of male genital organ, site unspecified
Cancer or chemotherapy/radiation	188	Diagnosis	ICD-9-CM	Malignant neoplasm of bladder
Cancer or chemotherapy/radiation	188.0	Diagnosis	ICD-9-CM	Malignant neoplasm of trigone of urinary bladder
Cancer or chemotherapy/radiation	188.1	Diagnosis	ICD-9-CM	Malignant neoplasm of dome of urinary bladder
Cancer or chemotherapy/radiation	188.2	Diagnosis	ICD-9-CM	Malignant neoplasm of lateral wall of urinary bladder
Cancer or chemotherapy/radiation	188.3	Diagnosis	ICD-9-CM	Malignant neoplasm of anterior wall of urinary bladder
Cancer or chemotherapy/radiation	188.4	Diagnosis	ICD-9-CM	Malignant neoplasm of posterior wall of urinary bladder
Cancer or chemotherapy/radiation	188.5	Diagnosis	ICD-9-CM	Malignant neoplasm of bladder neck
Cancer or chemotherapy/radiation	188.6	Diagnosis	ICD-9-CM	Malignant neoplasm of ureteric orifice
Cancer or chemotherapy/radiation	188.7	Diagnosis	ICD-9-CM	Malignant neoplasm of urachus
Cancer or chemotherapy/radiation	188.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of bladder
Cancer or chemotherapy/radiation	188.9	Diagnosis	ICD-9-CM	Malignant neoplasm of bladder, part unspecified
Cancer or chemotherapy/radiation	189	Diagnosis	ICD-9-CM	Malignant neoplasm of kidney and other and unspecified urinary organs
Cancer or chemotherapy/radiation	189.0	Diagnosis	ICD-9-CM	Malignant neoplasm of kidney, except pelvis
Cancer or chemotherapy/radiation	189.1	Diagnosis	ICD-9-CM	Malignant neoplasm of renal pelvis
Cancer or chemotherapy/radiation	189.2	Diagnosis	ICD-9-CM	Malignant neoplasm of ureter
Cancer or chemotherapy/radiation	189.3	Diagnosis	ICD-9-CM	Malignant neoplasm of urethra
Cancer or chemotherapy/radiation	189.4	Diagnosis	ICD-9-CM	Malignant neoplasm of paraurethral glands
Cancer or chemotherapy/radiation	189.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of urinary organs
Cancer or chemotherapy/radiation	189.9	Diagnosis	ICD-9-CM	Malignant neoplasm of urinary organ, site unspecified
Cancer or chemotherapy/radiation	190.0	Diagnosis	ICD-9-CM	Malignant neoplasm of eyeball, except conjunctiva, cornea, retina, and choroid
Cancer or chemotherapy/radiation	190	Diagnosis	ICD-9-CM	Malignant neoplasm of eye
Cancer or chemotherapy/radiation	190.1	Diagnosis	ICD-9-CM	Malignant neoplasm of orbit
Cancer or chemotherapy/radiation	190.2	Diagnosis	ICD-9-CM	Malignant neoplasm of lacrimal gland
Cancer or chemotherapy/radiation	190.3	Diagnosis	ICD-9-CM	Malignant neoplasm of conjunctiva
Cancer or chemotherapy/radiation	190.4	Diagnosis	ICD-9-CM	Malignant neoplasm of cornea
Cancer or chemotherapy/radiation	190.5	Diagnosis	ICD-9-CM	Malignant neoplasm of retina

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	190.6	Diagnosis	ICD-9-CM	Malignant neoplasm of choroid
Cancer or chemotherapy/radiation	190.7	Diagnosis	ICD-9-CM	Malignant neoplasm of lacrimal duct
Cancer or chemotherapy/radiation	190.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of eye
Cancer or chemotherapy/radiation	190.9	Diagnosis	ICD-9-CM	Malignant neoplasm of eye, part unspecified
Cancer or chemotherapy/radiation	191.0	Diagnosis	ICD-9-CM	Malignant neoplasm of cerebrum, except lobes and ventricles
Cancer or chemotherapy/radiation	191	Diagnosis	ICD-9-CM	Malignant neoplasm of brain
Cancer or chemotherapy/radiation	191.1	Diagnosis	ICD-9-CM	Malignant neoplasm of frontal lobe of brain
Cancer or chemotherapy/radiation	191.2	Diagnosis	ICD-9-CM	Malignant neoplasm of temporal lobe of brain
Cancer or chemotherapy/radiation	191.3	Diagnosis	ICD-9-CM	Malignant neoplasm of parietal lobe of brain
Cancer or chemotherapy/radiation	191.4	Diagnosis	ICD-9-CM	Malignant neoplasm of occipital lobe of brain
Cancer or chemotherapy/radiation	191.5	Diagnosis	ICD-9-CM	Malignant neoplasm of ventricles of brain
Cancer or chemotherapy/radiation	191.6	Diagnosis	ICD-9-CM	Malignant neoplasm of cerebellum NOS
Cancer or chemotherapy/radiation	191.7	Diagnosis	ICD-9-CM	Malignant neoplasm of brain stem
Cancer or chemotherapy/radiation	191.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other parts of brain
Cancer or chemotherapy/radiation	191.9	Diagnosis	ICD-9-CM	Malignant neoplasm of brain, unspecified site
Cancer or chemotherapy/radiation	192	Diagnosis	ICD-9-CM	Malignant neoplasm of other and unspecified parts of nervous system
Cancer or chemotherapy/radiation	192.0	Diagnosis	ICD-9-CM	Malignant neoplasm of cranial nerves
Cancer or chemotherapy/radiation	192.1	Diagnosis	ICD-9-CM	Malignant neoplasm of cerebral meninges
Cancer or chemotherapy/radiation	192.2	Diagnosis	ICD-9-CM	Malignant neoplasm of spinal cord
Cancer or chemotherapy/radiation	192.3	Diagnosis	ICD-9-CM	Malignant neoplasm of spinal meninges
Cancer or chemotherapy/radiation	192.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites of nervous system
Cancer or chemotherapy/radiation	192.9	Diagnosis	ICD-9-CM	Malignant neoplasm of nervous system, part unspecified
Cancer or chemotherapy/radiation	193	Diagnosis	ICD-9-CM	Malignant neoplasm of thyroid gland
Cancer or chemotherapy/radiation	194	Diagnosis	ICD-9-CM	Malignant neoplasm of other endocrine glands and related structures
Cancer or chemotherapy/radiation	194.0	Diagnosis	ICD-9-CM	Malignant neoplasm of adrenal gland
Cancer or chemotherapy/radiation	194.1	Diagnosis	ICD-9-CM	Malignant neoplasm of parathyroid gland
Cancer or chemotherapy/radiation	194.3	Diagnosis	ICD-9-CM	Malignant neoplasm of pituitary gland and craniopharyngeal duct
Cancer or chemotherapy/radiation	194.4	Diagnosis	ICD-9-CM	Malignant neoplasm of pineal gland
Cancer or chemotherapy/radiation	194.5	Diagnosis	ICD-9-CM	Malignant neoplasm of carotid body
Cancer or chemotherapy/radiation	194.6	Diagnosis	ICD-9-CM	Malignant neoplasm of aortic body and other paraganglia
Cancer or chemotherapy/radiation	194.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other endocrine glands and related structures
Cancer or chemotherapy/radiation	194.9	Diagnosis	ICD-9-CM	Malignant neoplasm of endocrine gland, site unspecified
Cancer or chemotherapy/radiation	195.0	Diagnosis	ICD-9-CM	Malignant neoplasm of head, face, and neck
Cancer or chemotherapy/radiation	195	Diagnosis	ICD-9-CM	Malignant neoplasm of other and ill-defined sites
Cancer or chemotherapy/radiation	195.1	Diagnosis	ICD-9-CM	Malignant neoplasm of thorax
Cancer or chemotherapy/radiation	195.2	Diagnosis	ICD-9-CM	Malignant neoplasm of abdomen
Cancer or chemotherapy/radiation	195.3	Diagnosis	ICD-9-CM	Malignant neoplasm of pelvis

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	195.4	Diagnosis	ICD-9-CM	Malignant neoplasm of upper limb
Cancer or chemotherapy/radiation	195.5	Diagnosis	ICD-9-CM	Malignant neoplasm of lower limb
Cancer or chemotherapy/radiation	195.8	Diagnosis	ICD-9-CM	Malignant neoplasm of other specified sites
Cancer or chemotherapy/radiation	196.0	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of lymph nodes of head, face, and neck
Cancer or chemotherapy/radiation	196	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of lymph nodes
Cancer or chemotherapy/radiation	196.1	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of intrathoracic lymph nodes
Cancer or chemotherapy/radiation	196.2	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of intra-abdominal lymph nodes
Cancer or chemotherapy/radiation	196.3	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of lymph nodes of axilla and upper limb
Cancer or chemotherapy/radiation	196.5	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of lymph nodes of inguinal region and lower
Cancer or chemotherapy/radiation	196.6	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of intrapelvic lymph nodes
Cancer or chemotherapy/radiation	196.8	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of lymph nodes of multiple sites
Cancer or chemotherapy/radiation	196.9	Diagnosis	ICD-9-CM	Secondary and unspecified malignant neoplasm of lymph nodes, site unspecified
Cancer or chemotherapy/radiation	197	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of respiratory and digestive systems
Cancer or chemotherapy/radiation	197.0	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of lung
Cancer or chemotherapy/radiation	197.1	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of mediastinum
Cancer or chemotherapy/radiation	197.2	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of pleura
Cancer or chemotherapy/radiation	197.3	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of other respiratory organs
Cancer or chemotherapy/radiation	197.4	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of small intestine including duodenum
Cancer or chemotherapy/radiation	197.5	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of large intestine and rectum
Cancer or chemotherapy/radiation	197.6	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of retroperitoneum and peritoneum
Cancer or chemotherapy/radiation	197.7	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of liver
Cancer or chemotherapy/radiation	197.8	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of other digestive organs and spleen
Cancer or chemotherapy/radiation	198	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of other specified sites
Cancer or chemotherapy/radiation	198.0	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of kidney
Cancer or chemotherapy/radiation	198.1	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of other urinary organs
Cancer or chemotherapy/radiation	198.2	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of skin
Cancer or chemotherapy/radiation	198.3	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of brain and spinal cord
Cancer or chemotherapy/radiation	198.4	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of other parts of nervous system
Cancer or chemotherapy/radiation	198.5	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of bone and bone marrow
Cancer or chemotherapy/radiation	198.6	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of ovary
Cancer or chemotherapy/radiation	198.7	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of adrenal gland
Cancer or chemotherapy/radiation	198.8	Diagnosis	ICD-9-CM	Secondary malignant neoplasm of other specified sites
Cancer or chemotherapy/radiation	199.0	Diagnosis	ICD-9-CM	Disseminated malignant neoplasm
Cancer or chemotherapy/radiation	199	Diagnosis	ICD-9-CM	Malignant neoplasm without specification of site
Cancer or chemotherapy/radiation	199.1	Diagnosis	ICD-9-CM	Other malignant neoplasm of unspecified site
Cancer or chemotherapy/radiation	199.2	Diagnosis	ICD-9-CM	Malignant neoplasm associated with transplanted organ
Cancer or chemotherapy/radiation	200	Diagnosis	ICD-9-CM	Lymphosarcoma and reticulosarcoma and other specified malignant tumors of lymphatic

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Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	200.0	Diagnosis	ICD-9-CM	Reticulosarcoma
Cancer or chemotherapy/radiation	200.1	Diagnosis	ICD-9-CM	Lymphosarcoma
Cancer or chemotherapy/radiation	200.2	Diagnosis	ICD-9-CM	Burkitt's tumor or lymphoma
Cancer or chemotherapy/radiation	200.3	Diagnosis	ICD-9-CM	Marginal zone lymphoma
Cancer or chemotherapy/radiation	200.4	Diagnosis	ICD-9-CM	Mantle cell lymphoma
Cancer or chemotherapy/radiation	200.5	Diagnosis	ICD-9-CM	Primary central nervous system lymphoma
Cancer or chemotherapy/radiation	200.6	Diagnosis	ICD-9-CM	Anaplastic large cell lymphoma
Cancer or chemotherapy/radiation	200.7	Diagnosis	ICD-9-CM	Large cell lymphoma
Cancer or chemotherapy/radiation	200.8	Diagnosis	ICD-9-CM	Other named variants of lymphosarcoma and reticulosarcoma
Cancer or chemotherapy/radiation	201	Diagnosis	ICD-9-CM	Hodgkin's disease
Cancer or chemotherapy/radiation	201.0	Diagnosis	ICD-9-CM	Hodgkin's paraganuloma
Cancer or chemotherapy/radiation	201.1	Diagnosis	ICD-9-CM	Hodgkin's granuloma
Cancer or chemotherapy/radiation	201.2	Diagnosis	ICD-9-CM	Hodgkin's sarcoma
Cancer or chemotherapy/radiation	201.4	Diagnosis	ICD-9-CM	Hodgkin's disease, lymphocytic-histiocytic predominance
Cancer or chemotherapy/radiation	201.5	Diagnosis	ICD-9-CM	Hodgkin's disease, nodular sclerosis
Cancer or chemotherapy/radiation	201.6	Diagnosis	ICD-9-CM	Hodgkin's disease, mixed cellularity
Cancer or chemotherapy/radiation	201.7	Diagnosis	ICD-9-CM	Hodgkin's disease, lymphocytic depletion
Cancer or chemotherapy/radiation	201.9	Diagnosis	ICD-9-CM	Hodgkin's disease, unspecified type
Cancer or chemotherapy/radiation	202.0	Diagnosis	ICD-9-CM	Nodular lymphoma
Cancer or chemotherapy/radiation	202	Diagnosis	ICD-9-CM	Other malignant neoplasms of lymphoid and histiocytic tissue
Cancer or chemotherapy/radiation	202.1	Diagnosis	ICD-9-CM	Mycosis fungoides
Cancer or chemotherapy/radiation	202.2	Diagnosis	ICD-9-CM	Sezary's disease
Cancer or chemotherapy/radiation	202.3	Diagnosis	ICD-9-CM	Malignant histiocytosis
Cancer or chemotherapy/radiation	202.4	Diagnosis	ICD-9-CM	Leukemic reticuloendotheliosis
Cancer or chemotherapy/radiation	202.5	Diagnosis	ICD-9-CM	Letterer-Siwe disease
Cancer or chemotherapy/radiation	202.6	Diagnosis	ICD-9-CM	Malignant mast cell tumors
Cancer or chemotherapy/radiation	202.7	Diagnosis	ICD-9-CM	Peripheral T-cell lymphoma
Cancer or chemotherapy/radiation	202.8	Diagnosis	ICD-9-CM	Other malignant lymphomas
Cancer or chemotherapy/radiation	202.9	Diagnosis	ICD-9-CM	Other and unspecified malignant neoplasms of lymphoid and histiocytic tissue
Cancer or chemotherapy/radiation	203.0	Diagnosis	ICD-9-CM	Multiple myeloma
Cancer or chemotherapy/radiation	203	Diagnosis	ICD-9-CM	Multiple myeloma and immunoproliferative neoplasms
Cancer or chemotherapy/radiation	203.1	Diagnosis	ICD-9-CM	Plasma cell leukemia
Cancer or chemotherapy/radiation	203.8	Diagnosis	ICD-9-CM	Other immunoproliferative neoplasms
Cancer or chemotherapy/radiation	204.0	Diagnosis	ICD-9-CM	Acute lymphoid leukemia
Cancer or chemotherapy/radiation	204	Diagnosis	ICD-9-CM	Lymphoid leukemia
Cancer or chemotherapy/radiation	204.1	Diagnosis	ICD-9-CM	Chronic lymphoid leukemia
Cancer or chemotherapy/radiation	204.2	Diagnosis	ICD-9-CM	Subacute lymphoid leukemia

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Exclusion	Code	Code Category	Code Type	Description
Cancer or chemotherapy/radiation	204.8	Diagnosis	ICD-9-CM	Other lymphoid leukemia
Cancer or chemotherapy/radiation	204.9	Diagnosis	ICD-9-CM	Unspecified lymphoid leukemia
Cancer or chemotherapy/radiation	205.0	Diagnosis	ICD-9-CM	Acute myeloid leukemia
Cancer or chemotherapy/radiation	205	Diagnosis	ICD-9-CM	Myeloid leukemia
Cancer or chemotherapy/radiation	205.1	Diagnosis	ICD-9-CM	Chronic myeloid leukemia
Cancer or chemotherapy/radiation	205.2	Diagnosis	ICD-9-CM	Subacute myeloid leukemia
Cancer or chemotherapy/radiation	205.3	Diagnosis	ICD-9-CM	Myeloid sarcoma
Cancer or chemotherapy/radiation	205.8	Diagnosis	ICD-9-CM	Other myeloid leukemia
Cancer or chemotherapy/radiation	205.9	Diagnosis	ICD-9-CM	Unspecified myeloid leukemia
Cancer or chemotherapy/radiation	206.0	Diagnosis	ICD-9-CM	Acute monocytic leukemia
Cancer or chemotherapy/radiation	206	Diagnosis	ICD-9-CM	Monocytic leukemia
Cancer or chemotherapy/radiation	206.1	Diagnosis	ICD-9-CM	Chronic monocytic leukemia
Cancer or chemotherapy/radiation	206.2	Diagnosis	ICD-9-CM	Subacute monocytic leukemia
Cancer or chemotherapy/radiation	206.8	Diagnosis	ICD-9-CM	Other monocytic leukemia
Cancer or chemotherapy/radiation	206.9	Diagnosis	ICD-9-CM	Unspecified monocytic leukemia
Cancer or chemotherapy/radiation	207.0	Diagnosis	ICD-9-CM	Acute erythremia and erythroleukemia
Cancer or chemotherapy/radiation	207	Diagnosis	ICD-9-CM	Other specified leukemia
Cancer or chemotherapy/radiation	207.1	Diagnosis	ICD-9-CM	Chronic erythremia
Cancer or chemotherapy/radiation	207.2	Diagnosis	ICD-9-CM	Megakaryocytic leukemia
Cancer or chemotherapy/radiation	207.8	Diagnosis	ICD-9-CM	Other specified leukemia
Cancer or chemotherapy/radiation	208.0	Diagnosis	ICD-9-CM	Acute leukemia of unspecified cell type
Cancer or chemotherapy/radiation	208	Diagnosis	ICD-9-CM	Leukemia of unspecified cell type
Cancer or chemotherapy/radiation	208.1	Diagnosis	ICD-9-CM	Chronic leukemia of unspecified cell type
Cancer or chemotherapy/radiation	208.2	Diagnosis	ICD-9-CM	Subacute leukemia of unspecified cell type
Cancer or chemotherapy/radiation	208.8	Diagnosis	ICD-9-CM	Other leukemia of unspecified cell type
Cancer or chemotherapy/radiation	208.9	Diagnosis	ICD-9-CM	Unspecified leukemia
Cancer or chemotherapy/radiation	V58.0	Diagnosis	ICD-9-CM	Radiotherapy
Cancer or chemotherapy/radiation	V58.1	Diagnosis	ICD-9-CM	Encounter for antineoplastic chemotherapy and immunotherapy
Cancer or chemotherapy/radiation	V58.11	Diagnosis	ICD-9-CM	Encounter for antineoplastic chemotherapy
Cancer or chemotherapy/radiation	V58.12	Diagnosis	ICD-9-CM	Encounter for antineoplastic immunotherapy
Severe or life-threatening medical	042	Diagnosis	ICD-9-CM	Human immunodeficiency virus [HIV]
Severe or life-threatening medical	079.53	Diagnosis	ICD-9-CM	Human immunodeficiency virus, type 2 (HIV 2), in conditions classified elsewhere and of
Severe or life-threatening medical	403	Diagnosis	ICD-9-CM	Hypertensive chronic kidney disease
Severe or life-threatening medical	403.1	Diagnosis	ICD-9-CM	Hypertensive chronic kidney disease, benign
Severe or life-threatening medical	403.9	Diagnosis	ICD-9-CM	Hypertensive chronic kidney disease, unspecified
Severe or life-threatening medical	404.0	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, malignant
Severe or life-threatening medical	404	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Severe or life-threatening medical	404.01	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, malignant, with heart failure and with chronic
Severe or life-threatening medical	404.03	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, malignant, with heart failure and with chronic
Severe or life-threatening medical	404.1	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, benign
Severe or life-threatening medical	404.11	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, benign, with heart failure and with chronic
Severe or life-threatening medical	404.13	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, benign, with heart failure and chronic kidney
Severe or life-threatening medical	404.9	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, unspecified
Severe or life-threatening medical	404.93	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, unspecified, with heart failure and chronic
Severe or life-threatening medical	428.0	Diagnosis	ICD-9-CM	Congestive heart failure, unspecified
Severe or life-threatening medical	428	Diagnosis	ICD-9-CM	Heart failure
Severe or life-threatening medical	428.1	Diagnosis	ICD-9-CM	Left heart failure
Severe or life-threatening medical	428.2	Diagnosis	ICD-9-CM	Systolic heart failure
Severe or life-threatening medical	428.20	Diagnosis	ICD-9-CM	Unspecified systolic heart failure
Severe or life-threatening medical	428.21	Diagnosis	ICD-9-CM	Acute systolic heart failure
Severe or life-threatening medical	428.22	Diagnosis	ICD-9-CM	Chronic systolic heart failure
Severe or life-threatening medical	428.23	Diagnosis	ICD-9-CM	Acute on chronic systolic heart failure
Severe or life-threatening medical	428.3	Diagnosis	ICD-9-CM	Diastolic heart failure
Severe or life-threatening medical	428.30	Diagnosis	ICD-9-CM	Unspecified diastolic heart failure
Severe or life-threatening medical	428.31	Diagnosis	ICD-9-CM	Acute diastolic heart failure
Severe or life-threatening medical	428.32	Diagnosis	ICD-9-CM	Chronic diastolic heart failure
Severe or life-threatening medical	428.33	Diagnosis	ICD-9-CM	Acute on chronic diastolic heart failure
Severe or life-threatening medical	428.4	Diagnosis	ICD-9-CM	Combined systolic and diastolic heart failure
Severe or life-threatening medical	428.40	Diagnosis	ICD-9-CM	Unspecified combined systolic and diastolic heart failure
Severe or life-threatening medical	428.41	Diagnosis	ICD-9-CM	Acute combined systolic and diastolic heart failure
Severe or life-threatening medical	428.42	Diagnosis	ICD-9-CM	Chronic combined systolic and diastolic heart failure
Severe or life-threatening medical	428.43	Diagnosis	ICD-9-CM	Acute on chronic combined systolic and diastolic heart failure
Severe or life-threatening medical	428.9	Diagnosis	ICD-9-CM	Unspecified heart failure
Severe or life-threatening medical	518.81	Diagnosis	ICD-9-CM	Acute respiratory failure
Severe or life-threatening medical	518.83	Diagnosis	ICD-9-CM	Chronic respiratory failure
Severe or life-threatening medical	518.84	Diagnosis	ICD-9-CM	Acute and chronic respiratory failure
Severe or life-threatening medical	573.8	Diagnosis	ICD-9-CM	Other specified disorders of liver
Severe or life-threatening medical	581	Diagnosis	ICD-9-CM	Nephrotic syndrome
Severe or life-threatening medical	581.9	Diagnosis	ICD-9-CM	Nephrotic syndrome with unspecified pathological lesion in kidney
Severe or life-threatening medical	584	Diagnosis	ICD-9-CM	Acute kidney failure
Severe or life-threatening medical	584.5	Diagnosis	ICD-9-CM	Acute kidney failure with lesion of tubular necrosis
Severe or life-threatening medical	584.6	Diagnosis	ICD-9-CM	Acute kidney failure with lesion of renal cortical necrosis
Severe or life-threatening medical	584.7	Diagnosis	ICD-9-CM	Acute kidney failure with lesion of medullary [papillary] necrosis
Severe or life-threatening medical	584.8	Diagnosis	ICD-9-CM	Acute kidney failure with other specified pathological lesion in kidney

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Severe or life-threatening medical	584.9	Diagnosis	ICD-9-CM	Acute kidney failure, unspecified
Severe or life-threatening medical	585	Diagnosis	ICD-9-CM	Chronic kidney disease (CKD)
Severe or life-threatening medical	585.9	Diagnosis	ICD-9-CM	Chronic kidney disease, unspecified
Severe or life-threatening medical	586	Diagnosis	ICD-9-CM	Unspecified renal failure
Severe or life-threatening medical	795.71	Diagnosis	ICD-9-CM	Nonspecific serologic evidence of human immunodeficiency virus (HIV)
Severe or life-threatening medical	V08	Diagnosis	ICD-9-CM	Asymptomatic human immunodeficiency virus (HIV) infection status
Severe or life-threatening medical	V45.11	Diagnosis	ICD-9-CM	Renal dialysis status
Severe or life-threatening medical	V45.12	Diagnosis	ICD-9-CM	Noncompliance with renal dialysis
Severe or life-threatening medical	V56	Diagnosis	ICD-9-CM	Encounter for dialysis and dialysis catheter care
Severe or life-threatening medical	V65.44	Diagnosis	ICD-9-CM	Human immunodeficiency virus (HIV) counseling
Transplant	33.5	Procedure	ICD-9-CM	Lung transplant
Transplant	33.6	Procedure	ICD-9-CM	Combined heart-lung transplantation
Transplant	37.51	Procedure	ICD-9-CM	Heart transplantation
Transplant	41.00	Procedure	ICD-9-CM	Bone marrow transplant, not otherwise specified
Transplant	41.01	Procedure	ICD-9-CM	Autologous bone marrow transplant without purging
Transplant	41.02	Procedure	ICD-9-CM	Allogeneic bone marrow transplant with purging
Transplant	41.03	Procedure	ICD-9-CM	Allogeneic bone marrow transplant without purging
Transplant	41.04	Procedure	ICD-9-CM	Autologous hematopoietic stem cell transplant without purging
Transplant	41.05	Procedure	ICD-9-CM	Allogeneic hematopoietic stem cell transplant without purging
Transplant	41.06	Procedure	ICD-9-CM	Cord blood stem cell transplant
Transplant	41.07	Procedure	ICD-9-CM	Autologous hematopoietic stem cell transplant with purging
Transplant	41.08	Procedure	ICD-9-CM	Allogeneic hematopoietic stem cell transplant with purging
Transplant	41.09	Procedure	ICD-9-CM	Autologous bone marrow transplant with purging
Transplant	50.5	Procedure	ICD-9-CM	Liver transplant
Transplant	50.51	Procedure	ICD-9-CM	Auxiliary liver transplant
Transplant	50.59	Procedure	ICD-9-CM	Other transplant of liver
Transplant	52.80	Procedure	ICD-9-CM	Pancreatic transplant, not otherwise specified
Transplant	52.8	Procedure	ICD-9-CM	Transplant of pancreas
Transplant	52.81	Procedure	ICD-9-CM	Reimplantation of pancreatic tissue
Transplant	52.82	Procedure	ICD-9-CM	Homotransplant of pancreas
Transplant	52.83	Procedure	ICD-9-CM	Heterotransplant of pancreas
Transplant	52.84	Procedure	ICD-9-CM	Autotransplantation of cells of islets of Langerhans
Transplant	52.85	Procedure	ICD-9-CM	Allotransplantation of cells of islets of Langerhans
Transplant	52.86	Procedure	ICD-9-CM	Transplantation of cells of islets of Langerhans, not otherwise specified
Transplant	55.6	Procedure	ICD-9-CM	Transplant of kidney
Transplant	55.61	Procedure	ICD-9-CM	Renal autotransplantation
Transplant	55.69	Procedure	ICD-9-CM	Other kidney transplantation

Appendix D: List of Diagnosis and Procedure Codes Used to Define Exclusions

Exclusion	Code	Code Category	Code Type	Description
Transplant	995.92	Diagnosis	ICD-9-CM	Severe sepsis
Transplant	996.81	Diagnosis	ICD-9-CM	Complications of transplanted kidney
Transplant	996.82	Diagnosis	ICD-9-CM	Complications of transplanted liver
Transplant	996.83	Diagnosis	ICD-9-CM	Complications of transplanted heart
Transplant	996.84	Diagnosis	ICD-9-CM	Complications of transplanted lung
Transplant	996.85	Diagnosis	ICD-9-CM	Complications of bone marrow transplant
Transplant	996.86	Diagnosis	ICD-9-CM	Complications of transplanted pancreas
Transplant	32851	Procedure	CPT-4	Lung transplant, single; without cardiopulmonary bypass
Transplant	32852	Procedure	CPT-4	Lung transplant, single; with cardiopulmonary bypass
Transplant	32853	Procedure	CPT-4	Lung transplant, double (bilateral sequential or en bloc); without cardiopulmonary bypass
Transplant	32854	Procedure	CPT-4	Lung transplant, double (bilateral sequential or en bloc); with cardiopulmonary bypass
Transplant	33935	Procedure	CPT-4	Heart-lung transplant with recipient cardiectomy-pneumonectomy
Transplant	33945	Procedure	CPT-4	Heart transplant, with or without recipient cardiectomy
Transplant	44133	Procedure	CPT-4	Donor enterectomy (including cold preservation), open; partial, from living donor
Transplant	44135	Procedure	CPT-4	Intestinal allotransplantation; from cadaver donor
Transplant	44136	Procedure	CPT-4	Intestinal allotransplantation; from living donor
Transplant	44137	Procedure	CPT-4	Removal of transplanted intestinal allograft, complete
Transplant	47135	Procedure	CPT-4	Liver allotransplantation; orthotopic, partial or whole, from cadaver or living donor, any age
Transplant	48554	Procedure	CPT-4	Transplantation of pancreatic allograft
Transplant	50360	Procedure	CPT-4	Renal allotransplantation, implantation of graft; without recipient nephrectomy
Transplant	50365	Procedure	CPT-4	Renal allotransplantation, implantation of graft; with recipient nephrectomy
Transplant	50380	Procedure	CPT-4	Renal autotransplantation, reimplantation of kidney
Transplant	V42.0	Diagnosis	ICD-9-CM	Kidney replaced by transplant
Transplant	V42.1	Diagnosis	ICD-9-CM	Heart replaced by transplant
Transplant	V42.6	Diagnosis	ICD-9-CM	Lung replaced by transplant
Transplant	V42.7	Diagnosis	ICD-9-CM	Liver replaced by transplant
Transplant	V42.81	Diagnosis	ICD-9-CM	Bone marrow replaced by transplant
Transplant	V42.82	Diagnosis	ICD-9-CM	Peripheral stem cells replaced by transplant
Transplant	V42.83	Diagnosis	ICD-9-CM	Pancreas replaced by transplant

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Preterm and Postterm Delivery Codes

Code	Code Category	Code Type	Description	Preterm Code	Postterm Code	Priority	Duration of Pregnancy (Days)
64421	Diagnosis	ICD-9-CM	Early onset of delivery, delivered, with or without mention of antepartum condition	Yes	No	8	245
645.10	Diagnosis	ICD-9-CM	Post term pregnancy, unspecified as to episode of care or not applicable	No	Yes	2	287
645.1	Diagnosis	ICD-9-CM	Post term pregnancy	No	Yes	2	287
645.11	Diagnosis	ICD-9-CM	Post term pregnancy, delivered, with or without mention of antepartum condition	No	Yes	2	287
645.13	Diagnosis	ICD-9-CM	Post term pregnancy, antepartum condition or complication	No	Yes	2	287
645.20	Diagnosis	ICD-9-CM	Prolonged pregnancy, unspecified as to episode of care or not applicable	No	Yes	1	294
645.2	Diagnosis	ICD-9-CM	Prolonged pregnancy	No	Yes	1	294
645.21	Diagnosis	ICD-9-CM	Prolonged pregnancy, delivered, with or without mention of antepartum condition	No	Yes	1	294
645.23	Diagnosis	ICD-9-CM	Prolonged pregnancy, antepartum condition or complication	No	Yes	1	294
765.0	Diagnosis	ICD-9-CM	Extreme fetal immaturity	Yes	No	5	196
765.00	Diagnosis	ICD-9-CM	Extreme fetal immaturity, unspecified (weight)	Yes	No	5	196
765.01	Diagnosis	ICD-9-CM	Extreme fetal immaturity, less than 500 grams	Yes	No	5	196
765.02	Diagnosis	ICD-9-CM	Extreme fetal immaturity, 500-749 grams	Yes	No	5	196
765.03	Diagnosis	ICD-9-CM	Extreme fetal immaturity, 750-999 grams	Yes	No	5	196
765.04	Diagnosis	ICD-9-CM	Extreme fetal immaturity, 1,000-1,249 grams	Yes	No	5	196
765.05	Diagnosis	ICD-9-CM	Extreme fetal immaturity, 1,250-1,499 grams	Yes	No	5	196
765.06	Diagnosis	ICD-9-CM	Extreme fetal immaturity, 1,500-1,749 grams	Yes	No	5	196
765.07	Diagnosis	ICD-9-CM	Extreme fetal immaturity, 1,750-1,999 grams	Yes	No	5	196
765.08	Diagnosis	ICD-9-CM	Extreme fetal immaturity, 2,000-2,499 grams	Yes	No	5	196
765.09	Diagnosis	ICD-9-CM	Extreme fetal immaturity, 2,500 or more grams	Yes	No	5	196
765.1	Diagnosis	ICD-9-CM	Other preterm infants	Yes	No	8	245
765.10	Diagnosis	ICD-9-CM	Other preterm infants, unspecified (weight)	Yes	No	8	245
765.11	Diagnosis	ICD-9-CM	Other preterm infants, less than 500 grams	Yes	No	8	245
765.12	Diagnosis	ICD-9-CM	Other preterm infants, 500-749 grams	Yes	No	8	245
765.13	Diagnosis	ICD-9-CM	Other preterm infants, 750-999 grams	Yes	No	8	245
765.14	Diagnosis	ICD-9-CM	Other preterm infants, 1,000-1,249 grams	Yes	No	8	245
765.15	Diagnosis	ICD-9-CM	Other preterm infants, 1,250-1,499 grams	Yes	No	8	245
765.16	Diagnosis	ICD-9-CM	Other preterm infants, 1,500-1,749 grams	Yes	No	8	245
765.17	Diagnosis	ICD-9-CM	Other preterm infants, 1,750-1,999 grams	Yes	No	8	245
765.18	Diagnosis	ICD-9-CM	Other preterm infants, 2,000-2,499 grams	Yes	No	8	245
765.19	Diagnosis	ICD-9-CM	Other preterm infants, 2,500 or more grams	Yes	No	8	245
765.20	Diagnosis	ICD-9-CM	Unspecified weeks of gestation	Yes	No	8	245
765.21	Diagnosis	ICD-9-CM	Less than 24 completed weeks of gestation	Yes	No	7	168
765.22	Diagnosis	ICD-9-CM	24 completed weeks of gestation	Yes	No	7	168
765.23	Diagnosis	ICD-9-CM	25-26 completed weeks of gestation	Yes	No	6	182
765.24	Diagnosis	ICD-9-CM	27-28 completed weeks of gestation	Yes	No	5	196
765.25	Diagnosis	ICD-9-CM	29-30 completed weeks of gestation	Yes	No	4	210
765.26	Diagnosis	ICD-9-CM	31-32 completed weeks of gestation	Yes	No	3	224
765.27	Diagnosis	ICD-9-CM	33-34 completed weeks of gestation	Yes	No	2	238
765.28	Diagnosis	ICD-9-CM	35-36 completed weeks of gestation	Yes	No	1	252
766.21	Diagnosis	ICD-9-CM	Post-term infant	No	Yes	2	287
766.22	Diagnosis	ICD-9-CM	Prolonged gestation of infant	No	Yes	1	294

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
59409	Procedure	CPT4	Vaginal delivery only (with or without episiotomy and/or forceps);
59410	Procedure	CPT4	Vaginal delivery only (with or without episiotomy and/or forceps); including postpartum care
59510	Procedure	CPT4	Routine obstetric care including antepartum care, cesarean delivery, and postpartum care
59514	Procedure	CPT4	Cesarean delivery only;
59515	Procedure	CPT4	Cesarean delivery only; including postpartum care
59610	Procedure	CPT4	Routine obstetric care including antepartum care, vaginal delivery (with or without episiotomy, and/or forceps) and postpartum care, after previous cesarean delivery
59612	Procedure	CPT4	Vaginal delivery only, after previous cesarean delivery (with or without episiotomy and/or forceps);
59614	Procedure	CPT4	Vaginal delivery only, after previous cesarean delivery (with or without episiotomy and/or forceps); including postpartum care
59618	Procedure	CPT4	Routine obstetric care including antepartum care, cesarean delivery, and postpartum care, following attempted vaginal delivery after previous cesarean delivery
59620	Procedure	CPT4	Cesarean delivery only, following attempted vaginal delivery after previous cesarean delivery;
59622	Procedure	CPT4	Cesarean delivery only, following attempted vaginal delivery after previous cesarean delivery; including postpartum care
64101	Diagnosis	ICD-9-CM	Placenta previa without hemorrhage, with delivery
64111	Diagnosis	ICD-9-CM	Hemorrhage from placenta previa, with delivery
64121	Diagnosis	ICD-9-CM	Premature separation of placenta, with delivery
64131	Diagnosis	ICD-9-CM	Antepartum hemorrhage associated with coagulation defects, with delivery
64181	Diagnosis	ICD-9-CM	Other antepartum hemorrhage, with delivery
64191	Diagnosis	ICD-9-CM	Unspecified antepartum hemorrhage, with delivery
64201	Diagnosis	ICD-9-CM	Benign essential hypertension with delivery
64202	Diagnosis	ICD-9-CM	Benign essential hypertension, with delivery, with current postpartum complication
64211	Diagnosis	ICD-9-CM	Hypertension secondary to renal disease, with delivery
64212	Diagnosis	ICD-9-CM	Hypertension secondary to renal disease, with delivery, with current postpartum complication
64221	Diagnosis	ICD-9-CM	Other pre-existing hypertension, with delivery
64222	Diagnosis	ICD-9-CM	Other pre-existing hypertension, with delivery, with current postpartum complication
64231	Diagnosis	ICD-9-CM	Transient hypertension of pregnancy, with delivery
64232	Diagnosis	ICD-9-CM	Transient hypertension of pregnancy, with delivery, with current postpartum complication
64241	Diagnosis	ICD-9-CM	Mild or unspecified pre-eclampsia, with delivery
64242	Diagnosis	ICD-9-CM	Mild or unspecified pre-eclampsia, with delivery, with current postpartum complication
64251	Diagnosis	ICD-9-CM	Severe pre-eclampsia, with delivery
64252	Diagnosis	ICD-9-CM	Severe pre-eclampsia, with delivery, with current postpartum complication
64261	Diagnosis	ICD-9-CM	Eclampsia, with delivery
64262	Diagnosis	ICD-9-CM	Eclampsia, with delivery, with current postpartum complication
64271	Diagnosis	ICD-9-CM	Pre-eclampsia or eclampsia superimposed on pre-existing hypertension, with delivery
64272	Diagnosis	ICD-9-CM	Pre-eclampsia or eclampsia superimposed on pre-existing hypertension, with delivery, with current postpartum complication
64291	Diagnosis	ICD-9-CM	Unspecified hypertension, with delivery

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
64292	Diagnosis	ICD-9-CM	Unspecified hypertension, with delivery, with current postpartum complication
64301	Diagnosis	ICD-9-CM	Mild hyperemesis gravidarum, delivered
64311	Diagnosis	ICD-9-CM	Hyperemesis gravidarum with metabolic disturbance, delivered
64321	Diagnosis	ICD-9-CM	Late vomiting of pregnancy, delivered
64381	Diagnosis	ICD-9-CM	Other vomiting complicating pregnancy, delivered
64391	Diagnosis	ICD-9-CM	Unspecified vomiting of pregnancy, delivered
64421	Diagnosis	ICD-9-CM	Early onset of delivery, delivered, with or without mention of antepartum condition
64501	Diagnosis	ICD-9-CM	Prolonged pregnancy, with delivery
64511	Diagnosis	ICD-9-CM	Post term pregnancy, delivered, with or without mention of antepartum condition
64521	Diagnosis	ICD-9-CM	Prolonged pregnancy, delivered, with or without mention of antepartum condition
64601	Diagnosis	ICD-9-CM	Papyraceous fetus, delivered, with or without mention of antepartum condition
64611	Diagnosis	ICD-9-CM	Edema or excessive weight gain in pregnancy, with delivery, with or without mention of antepartum complication
64612	Diagnosis	ICD-9-CM	Edema or excessive weight gain in pregnancy, with delivery, with current postpartum complication
64621	Diagnosis	ICD-9-CM	Unspecified renal disease in pregnancy, with delivery
64622	Diagnosis	ICD-9-CM	Unspecified renal disease in pregnancy, with delivery, with current postpartum complication
64631	Diagnosis	ICD-9-CM	Pregnancy complication, recurrent pregnancy loss, with or without mention of antepartum condition
64641	Diagnosis	ICD-9-CM	Peripheral neuritis in pregnancy, with delivery
64642	Diagnosis	ICD-9-CM	Peripheral neuritis in pregnancy, with delivery, with current postpartum complication
64651	Diagnosis	ICD-9-CM	Asymptomatic bacteriuria in pregnancy, with delivery
64652	Diagnosis	ICD-9-CM	Asymptomatic bacteriuria in pregnancy, with delivery, with current postpartum complication
64661	Diagnosis	ICD-9-CM	Infections of genitourinary tract in pregnancy, with delivery
64662	Diagnosis	ICD-9-CM	Infections of genitourinary tract in pregnancy, with delivery, with current postpartum complication
64671	Diagnosis	ICD-9-CM	Liver and biliary tract disorders in pregnancy, delivered, with or without mention of antepartum condition
64681	Diagnosis	ICD-9-CM	Other specified complication of pregnancy, with delivery
64682	Diagnosis	ICD-9-CM	Other specified complications of pregnancy, with delivery, with current postpartum complication
64691	Diagnosis	ICD-9-CM	Unspecified complication of pregnancy, with delivery
64701	Diagnosis	ICD-9-CM	Maternal syphilis, complicating pregnancy, with delivery
64702	Diagnosis	ICD-9-CM	Maternal syphilis, complicating pregnancy, with delivery, with current postpartum complication
64711	Diagnosis	ICD-9-CM	Maternal gonorrhea with delivery
64712	Diagnosis	ICD-9-CM	Maternal gonorrhea, with delivery, with current postpartum complication
64721	Diagnosis	ICD-9-CM	Other maternal venereal diseases with delivery
64722	Diagnosis	ICD-9-CM	Other maternal venereal diseases with delivery, with current postpartum complication
64731	Diagnosis	ICD-9-CM	Maternal tuberculosis with delivery
64732	Diagnosis	ICD-9-CM	Maternal tuberculosis with delivery, with current postpartum complication
64741	Diagnosis	ICD-9-CM	Maternal malaria with delivery
64742	Diagnosis	ICD-9-CM	Maternal malaria with delivery, with current postpartum complication
64751	Diagnosis	ICD-9-CM	Maternal rubella with delivery

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
64752	Diagnosis	ICD-9-CM	Maternal rubella with delivery, with current postpartum complication
64761	Diagnosis	ICD-9-CM	Other maternal viral disease with delivery
64762	Diagnosis	ICD-9-CM	Other maternal viral disease with delivery, with current postpartum complication
64781	Diagnosis	ICD-9-CM	Other specified maternal infectious and parasitic disease with delivery
64782	Diagnosis	ICD-9-CM	Other specified maternal infectious and parasitic disease with delivery, with current postpartum complication
64791	Diagnosis	ICD-9-CM	Unspecified maternal infection or infestation with delivery
64792	Diagnosis	ICD-9-CM	Unspecified maternal infection or infestation with delivery, with current postpartum complication
64801	Diagnosis	ICD-9-CM	Maternal diabetes mellitus with delivery
64802	Diagnosis	ICD-9-CM	Maternal diabetes mellitus with delivery, with current postpartum complication
64811	Diagnosis	ICD-9-CM	Maternal thyroid dysfunction with delivery, with or without mention of antepartum condition
64812	Diagnosis	ICD-9-CM	Maternal thyroid dysfunction with delivery, with current postpartum complication
64821	Diagnosis	ICD-9-CM	Maternal anemia, with delivery
64822	Diagnosis	ICD-9-CM	Maternal anemia with delivery, with current postpartum complication
64831	Diagnosis	ICD-9-CM	Maternal drug dependence, with delivery
64832	Diagnosis	ICD-9-CM	Maternal drug dependence, with delivery, with current postpartum complication
64841	Diagnosis	ICD-9-CM	Maternal mental disorders, with delivery
64842	Diagnosis	ICD-9-CM	Maternal mental disorders, with delivery, with current postpartum complication
64851	Diagnosis	ICD-9-CM	Maternal congenital cardiovascular disorders, with delivery
64852	Diagnosis	ICD-9-CM	Maternal congenital cardiovascular disorders, with delivery, with current postpartum complication
64861	Diagnosis	ICD-9-CM	Other maternal cardiovascular diseases, with delivery
64862	Diagnosis	ICD-9-CM	Other maternal cardiovascular diseases, with delivery, with current postpartum complication
64871	Diagnosis	ICD-9-CM	Bone and joint disorders of maternal back, pelvis, and lower limbs, with delivery
64872	Diagnosis	ICD-9-CM	Bone and joint disorders of maternal back, pelvis, and lower limbs, with delivery, with current postpartum complication
64881	Diagnosis	ICD-9-CM	Abnormal maternal glucose tolerance, with delivery
64882	Diagnosis	ICD-9-CM	Abnormal maternal glucose tolerance, with delivery, with current postpartum complication
64891	Diagnosis	ICD-9-CM	Other current maternal conditions classifiable elsewhere, with delivery
64892	Diagnosis	ICD-9-CM	Other current maternal conditions classifiable elsewhere, with delivery, with current postpartum complication
64901	Diagnosis	ICD-9-CM	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, delivered, with or without mention of antepartum condition
64902	Diagnosis	ICD-9-CM	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, delivered, with mention of postpartum complication
64911	Diagnosis	ICD-9-CM	Obesity complicating pregnancy, childbirth, or the puerperium, delivered, with or without mention of antepartum condition
64912	Diagnosis	ICD-9-CM	Obesity complicating pregnancy, childbirth, or the puerperium, delivered, with mention of postpartum complication
64921	Diagnosis	ICD-9-CM	Bariatric surgery status complicating pregnancy, childbirth, or the puerperium, delivered, with or without mention of antepartum condition
64922	Diagnosis	ICD-9-CM	Bariatric surgery status complicating pregnancy, childbirth, or the puerperium, delivered, with mention of postpartum complication
64931	Diagnosis	ICD-9-CM	Coagulation defects complicating pregnancy, childbirth, or the puerperium, delivered, with or without mention of antepartum condition

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
64932	Diagnosis	ICD-9-CM	Coagulation defects complicating pregnancy, childbirth, or the puerperium, delivered, with mention of postpartum complication
64941	Diagnosis	ICD-9-CM	Epilepsy complicating pregnancy, childbirth, or the puerperium, delivered, with or without mention of antepartum condition
64942	Diagnosis	ICD-9-CM	Epilepsy complicating pregnancy, childbirth, or the puerperium, delivered, with mention of postpartum complication
64951	Diagnosis	ICD-9-CM	Spotting complicating pregnancy, delivered, with or without mention of antepartum condition
64961	Diagnosis	ICD-9-CM	Uterine size date discrepancy, delivered, with or without mention of antepartum condition
64962	Diagnosis	ICD-9-CM	Uterine size date discrepancy, delivered, with mention of postpartum complication
64971	Diagnosis	ICD-9-CM	Cervical shortening, delivered, with or without mention of antepartum condition
64981	Diagnosis	ICD-9-CM	Onset (spontaneous) of labor after 37 completed weeks of gestation but before 39 completed weeks gestation, with delivery by (planned) cesarean section, delivered, with or without mention of antepartum condition
64982	Diagnosis	ICD-9-CM	Onset (spontaneous) of labor after 37 completed weeks of gestation but before 39 completed weeks gestation, with delivery by (planned) cesarean section, delivered, with mention of postpartum complication
650	Diagnosis	ICD-9-CM	Normal delivery
65101	Diagnosis	ICD-9-CM	Twin pregnancy, delivered
65111	Diagnosis	ICD-9-CM	Triplet pregnancy, delivered
65121	Diagnosis	ICD-9-CM	Quadruplet pregnancy, delivered
65131	Diagnosis	ICD-9-CM	Twin pregnancy with fetal loss and retention of one fetus, delivered
65141	Diagnosis	ICD-9-CM	Triplet pregnancy with fetal loss and retention of one or more, delivered
65151	Diagnosis	ICD-9-CM	Quadruplet pregnancy with fetal loss and retention of one or more, delivered
65161	Diagnosis	ICD-9-CM	Other multiple pregnancy with fetal loss and retention of one or more fetus(es), delivered
65171	Diagnosis	ICD-9-CM	Multiple gestation following (elective) fetal reduction, delivered, with or without mention of antepartum condition
65181	Diagnosis	ICD-9-CM	Other specified multiple gestation, delivered
65191	Diagnosis	ICD-9-CM	Unspecified multiple gestation, delivered
65201	Diagnosis	ICD-9-CM	Unstable lie of fetus, delivered
65211	Diagnosis	ICD-9-CM	Breech or other malpresentation successfully converted to cephalic presentation, delivered
65221	Diagnosis	ICD-9-CM	Breech presentation without mention of version, delivered
65231	Diagnosis	ICD-9-CM	Transverse or oblique fetal presentation, delivered
65241	Diagnosis	ICD-9-CM	Fetal face or brow presentation, delivered
65251	Diagnosis	ICD-9-CM	High fetal head at term, delivered
65261	Diagnosis	ICD-9-CM	Multiple gestation with malpresentation of one fetus or more, delivered
65271	Diagnosis	ICD-9-CM	Prolapsed arm of fetus, delivered
65281	Diagnosis	ICD-9-CM	Other specified malposition or malpresentation of fetus, delivered
65291	Diagnosis	ICD-9-CM	Unspecified malposition or malpresentation of fetus, delivered
65301	Diagnosis	ICD-9-CM	Major abnormality of bony pelvis, not further specified, delivered
65311	Diagnosis	ICD-9-CM	Generally contracted pelvis in pregnancy, delivered
65321	Diagnosis	ICD-9-CM	Inlet contraction of pelvis in pregnancy, delivered
65331	Diagnosis	ICD-9-CM	Outlet contraction of pelvis in pregnancy, delivered
65341	Diagnosis	ICD-9-CM	Fetopelvic disproportion, delivered

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
65351	Diagnosis	ICD-9-CM	Unusually large fetus causing disproportion, delivered
65361	Diagnosis	ICD-9-CM	Hydrocephalic fetus causing disproportion, delivered
65371	Diagnosis	ICD-9-CM	Other fetal abnormality causing disproportion, delivered
65381	Diagnosis	ICD-9-CM	Fetal disproportion of other origin, delivered
65391	Diagnosis	ICD-9-CM	Unspecified fetal disproportion, delivered
65401	Diagnosis	ICD-9-CM	Congenital abnormalities of pregnant uterus, delivered
65402	Diagnosis	ICD-9-CM	Congenital abnormalities of pregnant uterus, delivered, with mention of postpartum complication
65411	Diagnosis	ICD-9-CM	Tumors of body of uterus, delivered
65412	Diagnosis	ICD-9-CM	Tumors of body of uterus, delivered, with mention of postpartum complication
65421	Diagnosis	ICD-9-CM	Previous cesarean delivery, delivered, with or without mention of antepartum condition
65431	Diagnosis	ICD-9-CM	Retroverted and incarcerated gravid uterus, delivered
65432	Diagnosis	ICD-9-CM	Retroverted and incarcerated gravid uterus, delivered, with mention of postpartum complication
65441	Diagnosis	ICD-9-CM	Other abnormalities in shape or position of gravid uterus and of neighboring structures, delivered
65442	Diagnosis	ICD-9-CM	Other abnormalities in shape or position of gravid uterus and of neighboring structures, delivered, with mention of postpartum complication
65451	Diagnosis	ICD-9-CM	Cervical incompetence, delivered
65452	Diagnosis	ICD-9-CM	Cervical incompetence, delivered, with mention of postpartum complication
65461	Diagnosis	ICD-9-CM	Other congenital or acquired abnormality of cervix, with delivery
65462	Diagnosis	ICD-9-CM	Other congenital or acquired abnormality of cervix, delivered, with mention of postpartum complication
65471	Diagnosis	ICD-9-CM	Congenital or acquired abnormality of vagina, with delivery
65472	Diagnosis	ICD-9-CM	Congenital or acquired abnormality of vagina, delivered, with mention of postpartum complication
65481	Diagnosis	ICD-9-CM	Congenital or acquired abnormality of vulva, with delivery
65482	Diagnosis	ICD-9-CM	Congenital or acquired abnormality of vulva, delivered, with mention of postpartum complication
65491	Diagnosis	ICD-9-CM	Other and unspecified abnormality of organs and soft tissues of pelvis, with delivery
65492	Diagnosis	ICD-9-CM	Other and unspecified abnormality of organs and soft tissues of pelvis, delivered, with mention of postpartum complication
65501	Diagnosis	ICD-9-CM	Central nervous system malformation in fetus, with delivery
65511	Diagnosis	ICD-9-CM	Chromosomal abnormality in fetus, affecting management of mother, with delivery
65521	Diagnosis	ICD-9-CM	Hereditary disease in family possibly affecting fetus, affecting management of mother, with delivery
65531	Diagnosis	ICD-9-CM	Suspected damage to fetus from viral disease in mother, affecting management of mother, with delivery
65541	Diagnosis	ICD-9-CM	Suspected damage to fetus from other disease in mother, affecting management of mother, with delivery
65551	Diagnosis	ICD-9-CM	Suspected damage to fetus from drugs, affecting management of mother, delivered
65561	Diagnosis	ICD-9-CM	Suspected damage to fetus from radiation, affecting management of mother, delivered
65571	Diagnosis	ICD-9-CM	Decreased fetal movements, affecting management of mother, delivered
65581	Diagnosis	ICD-9-CM	Other known or suspected fetal abnormality, not elsewhere classified, affecting management of mother, delivery
65591	Diagnosis	ICD-9-CM	Unspecified fetal abnormality affecting management of mother, delivery
65601	Diagnosis	ICD-9-CM	Fetal-maternal hemorrhage, with delivery
65611	Diagnosis	ICD-9-CM	Rhesus isoimmunization affecting management of mother, delivered

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
65621	Diagnosis	ICD-9-CM	Isoimmunization from other and unspecified blood-group incompatibility, affecting management of mother, delivered
65631	Diagnosis	ICD-9-CM	Fetal distress affecting management of mother, delivered
65641	Diagnosis	ICD-9-CM	Intrauterine death affecting management of mother, delivered
65651	Diagnosis	ICD-9-CM	Poor fetal growth, affecting management of mother, delivered
65661	Diagnosis	ICD-9-CM	Excessive fetal growth affecting management of mother, delivered
65671	Diagnosis	ICD-9-CM	Other placental conditions affecting management of mother, delivered
65681	Diagnosis	ICD-9-CM	Other specified fetal and placental problems affecting management of mother, delivered
65691	Diagnosis	ICD-9-CM	Unspecified fetal and placental problem affecting management of mother, delivered
65701	Diagnosis	ICD-9-CM	Polyhydramnios, with delivery
65801	Diagnosis	ICD-9-CM	Oligohydramnios, delivered
65811	Diagnosis	ICD-9-CM	Premature rupture of membranes in pregnancy, delivered
65821	Diagnosis	ICD-9-CM	Delayed delivery after spontaneous or unspecified rupture of membranes, delivered
65831	Diagnosis	ICD-9-CM	Delayed delivery after artificial rupture of membranes, delivered
65841	Diagnosis	ICD-9-CM	Infection of amniotic cavity, delivered
65881	Diagnosis	ICD-9-CM	Other problem associated with amniotic cavity and membranes, delivered
65891	Diagnosis	ICD-9-CM	Unspecified problem associated with amniotic cavity and membranes, delivered
65901	Diagnosis	ICD-9-CM	Failed mechanical induction of labor, delivered
65911	Diagnosis	ICD-9-CM	Failed medical or unspecified induction of labor, delivered
65921	Diagnosis	ICD-9-CM	Unspecified maternal pyrexia during labor, delivered
65931	Diagnosis	ICD-9-CM	Generalized infection during labor, delivered
65941	Diagnosis	ICD-9-CM	Grand multiparity, delivered, with or without mention of antepartum condition
65951	Diagnosis	ICD-9-CM	Elderly primigravida, delivered
65961	Diagnosis	ICD-9-CM	Elderly multigravida, delivered, with mention of antepartum condition
65971	Diagnosis	ICD-9-CM	Abnormality in fetal heart rate or rhythm, delivered, with or without mention of antepartum condition
65981	Diagnosis	ICD-9-CM	Other specified indication for care or intervention related to labor and delivery, delivered
65991	Diagnosis	ICD-9-CM	Unspecified indication for care or intervention related to labor and delivery, delivered
66001	Diagnosis	ICD-9-CM	Obstruction caused by malposition of fetus at onset of labor, delivered
66011	Diagnosis	ICD-9-CM	Obstruction by bony pelvis during labor and delivery, delivered
66021	Diagnosis	ICD-9-CM	Obstruction by abnormal pelvic soft tissues during labor and delivery, delivered
66031	Diagnosis	ICD-9-CM	Deep transverse arrest and persistent occipitoposterior position during labor and deliver, delivered
66041	Diagnosis	ICD-9-CM	Shoulder (girdle) dystocia during labor and deliver, delivered
66051	Diagnosis	ICD-9-CM	Locked twins, delivered
66061	Diagnosis	ICD-9-CM	Unspecified failed trial of labor, delivered
66071	Diagnosis	ICD-9-CM	Unspecified failed forceps or vacuum extractor, delivered
66081	Diagnosis	ICD-9-CM	Other causes of obstructed labor, delivered
66091	Diagnosis	ICD-9-CM	Unspecified obstructed labor, with delivery
66101	Diagnosis	ICD-9-CM	Primary uterine inertia, with delivery

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
66111	Diagnosis	ICD-9-CM	Secondary uterine inertia, with delivery
66121	Diagnosis	ICD-9-CM	Other and unspecified uterine inertia, with delivery
66131	Diagnosis	ICD-9-CM	Precipitate labor, with delivery
66141	Diagnosis	ICD-9-CM	Hypertonic, incoordinate, or prolonged uterine contractions, with delivery
66191	Diagnosis	ICD-9-CM	Unspecified abnormality of labor, with delivery
66201	Diagnosis	ICD-9-CM	Prolonged first stage of labor, delivered
66211	Diagnosis	ICD-9-CM	Unspecified prolonged labor, delivered
66221	Diagnosis	ICD-9-CM	Prolonged second stage of labor, delivered
66231	Diagnosis	ICD-9-CM	Delayed delivery of second twin, triplet, etc., delivered
66301	Diagnosis	ICD-9-CM	Prolapse of cord, complicating labor and delivery, delivered
66311	Diagnosis	ICD-9-CM	Cord around neck, with compression, complicating labor and delivery, delivered
66321	Diagnosis	ICD-9-CM	Other and unspecified cord entanglement, with compression, complicating labor and delivery, delivered
66331	Diagnosis	ICD-9-CM	Other and unspecified cord entanglement, without mention of compression, complicating labor and delivery, delivered
66341	Diagnosis	ICD-9-CM	Short cord complicating labor and delivery, delivered
66351	Diagnosis	ICD-9-CM	Vasa previa complicating labor and delivery, delivered
66361	Diagnosis	ICD-9-CM	Vascular lesions of cord complicating labor and delivery, delivered
66381	Diagnosis	ICD-9-CM	Other umbilical cord complications during labor and delivery, delivered
66391	Diagnosis	ICD-9-CM	Unspecified umbilical cord complication during labor and delivery, delivered
66401	Diagnosis	ICD-9-CM	First-degree perineal laceration, with delivery
66411	Diagnosis	ICD-9-CM	Second-degree perineal laceration, with delivery
66421	Diagnosis	ICD-9-CM	Third-degree perineal laceration, with delivery
66431	Diagnosis	ICD-9-CM	Fourth-degree perineal laceration, with delivery
66441	Diagnosis	ICD-9-CM	Unspecified perineal laceration, with delivery
66451	Diagnosis	ICD-9-CM	Vulvar and perineal hematoma, with delivery
66461	Diagnosis	ICD-9-CM	Anal sphincter tear complicating delivery, not associated with third-degree perineal laceration, delivered, with or without mention of antepartum condition
66481	Diagnosis	ICD-9-CM	Other specified trauma to perineum and vulva, with delivery
66491	Diagnosis	ICD-9-CM	Unspecified trauma to perineum and vulva, with delivery
66501	Diagnosis	ICD-9-CM	Rupture of uterus before onset of labor, with delivery
66511	Diagnosis	ICD-9-CM	Rupture of uterus during labor, with delivery
66522	Diagnosis	ICD-9-CM	Inversion of uterus, delivered with postpartum complication
66531	Diagnosis	ICD-9-CM	Laceration of cervix, with delivery
66541	Diagnosis	ICD-9-CM	High vaginal laceration, with delivery
66551	Diagnosis	ICD-9-CM	Other injury to pelvic organs, with delivery
66561	Diagnosis	ICD-9-CM	Damage to pelvic joints and ligaments, with delivery
66571	Diagnosis	ICD-9-CM	Pelvic hematoma, with delivery
66572	Diagnosis	ICD-9-CM	Pelvic hematoma, delivered with postpartum complication

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
66581	Diagnosis	ICD-9-CM	Other specified obstetrical trauma, with delivery
66582	Diagnosis	ICD-9-CM	Other specified obstetrical trauma, delivered, with postpartum
66591	Diagnosis	ICD-9-CM	Unspecified obstetrical trauma, with delivery
66592	Diagnosis	ICD-9-CM	Unspecified obstetrical trauma, delivered, with postpartum complication
66602	Diagnosis	ICD-9-CM	Third-stage postpartum hemorrhage, with delivery
66612	Diagnosis	ICD-9-CM	Other immediate postpartum hemorrhage, with delivery
66622	Diagnosis	ICD-9-CM	Delayed and secondary postpartum hemorrhage, with delivery
66632	Diagnosis	ICD-9-CM	Postpartum coagulation defects, with delivery
66702	Diagnosis	ICD-9-CM	Retained placenta without hemorrhage, with delivery, with mention of postpartum complication
66712	Diagnosis	ICD-9-CM	Retained portions of placenta or membranes, without hemorrhage, delivered, with mention of postpartum complication
66801	Diagnosis	ICD-9-CM	Pulmonary complications of the administration of anesthesia or other sedation in labor and delivery, delivered
66802	Diagnosis	ICD-9-CM	Pulmonary complications of the administration of anesthesia or other sedation in labor and delivery, delivered, with mention of postpartum complication
66811	Diagnosis	ICD-9-CM	Cardiac complications of the administration of anesthesia or other sedation in labor and delivery, delivered
66812	Diagnosis	ICD-9-CM	Cardiac complications of the administration of anesthesia or other sedation in labor and delivery, delivered, with mention of postpartum complication
66821	Diagnosis	ICD-9-CM	Central nervous system complications of the administration of anesthesia or other sedation in labor and delivery, delivered
66822	Diagnosis	ICD-9-CM	Central nervous system complications of the administration of anesthesia or other sedation in labor and delivery, delivered, with mention of postpartum complication
66881	Diagnosis	ICD-9-CM	Other complications of the administration of anesthesia or other sedation in labor and delivery, delivered
66882	Diagnosis	ICD-9-CM	Other complications of the administration of anesthesia or other sedation in labor and delivery, delivered, with mention of postpartum complication
66891	Diagnosis	ICD-9-CM	Unspecified complication of the administration of anesthesia or other sedation in labor and delivery, delivered
66892	Diagnosis	ICD-9-CM	Unspecified complication of the administration of anesthesia or other sedation in labor and delivery, delivered, with mention of postpartum complication
66901	Diagnosis	ICD-9-CM	Maternal distress, with delivery, with or without mention of antepartum condition
66902	Diagnosis	ICD-9-CM	Maternal distress, with delivery, with mention of postpartum complication
66911	Diagnosis	ICD-9-CM	Shock during or following labor and delivery, with delivery, with or without mention of antepartum condition
66912	Diagnosis	ICD-9-CM	Shock during or following labor and delivery, with delivery, with mention of postpartum complication
66921	Diagnosis	ICD-9-CM	Maternal hypotension syndrome, with delivery, with or without mention of antepartum condition
66922	Diagnosis	ICD-9-CM	Maternal hypotension syndrome, with delivery, with mention of postpartum complication
66932	Diagnosis	ICD-9-CM	Acute kidney failure following labor and delivery, delivered, with mention of postpartum complication
66941	Diagnosis	ICD-9-CM	Other complications of obstetrical surgery and procedures, with delivery, with or without mention of antepartum condition
66942	Diagnosis	ICD-9-CM	Other complications of obstetrical surgery and procedures, with delivery, with mention of postpartum complication
66951	Diagnosis	ICD-9-CM	Forceps or vacuum extractor delivery without mention of indication, delivered, with or without mention of antepartum condition
66961	Diagnosis	ICD-9-CM	Breech extraction, without mention of indication, delivered, with or without mention of antepartum condition
66971	Diagnosis	ICD-9-CM	Cesarean delivery, without mention of indication, delivered, with or without mention of antepartum condition

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
66981	Diagnosis	ICD-9-CM	Other complication of labor and delivery, delivered, with or without mention of antepartum condition
66982	Diagnosis	ICD-9-CM	Other complication of labor and delivery, delivered, with mention of postpartum complication
66991	Diagnosis	ICD-9-CM	Unspecified complication of labor and delivery, with delivery, with or without mention of antepartum condition
66992	Diagnosis	ICD-9-CM	Unspecified complication of labor and delivery, with delivery, with mention of postpartum complication
67002	Diagnosis	ICD-9-CM	Major puerperal infection, unspecified, delivered, with mention of postpartum complication
67012	Diagnosis	ICD-9-CM	Puerperal endometritis, delivered, with mention of postpartum complication
67022	Diagnosis	ICD-9-CM	Puerperal sepsis, delivered, with mention of postpartum complication
67032	Diagnosis	ICD-9-CM	Puerperal septic thrombophlebitis, delivered, with mention of postpartum complication
67082	Diagnosis	ICD-9-CM	Other major puerperal infection, delivered, with mention of postpartum complication
67101	Diagnosis	ICD-9-CM	Varicose veins of legs, with delivery, with or without mention of antepartum condition
67102	Diagnosis	ICD-9-CM	Varicose veins of legs, with delivery, with mention of postpartum complication
67111	Diagnosis	ICD-9-CM	Varicose veins of vulva and perineum, with delivery, with or without mention of antepartum condition
67112	Diagnosis	ICD-9-CM	Varicose veins of vulva and perineum, with delivery, with mention of postpartum complication
67121	Diagnosis	ICD-9-CM	Superficial thrombophlebitis with delivery, with or without mention of antepartum condition
67122	Diagnosis	ICD-9-CM	Superficial thrombophlebitis with delivery, with mention of postpartum complication
67131	Diagnosis	ICD-9-CM	Deep phlebothrombosis, antepartum, with delivery
67142	Diagnosis	ICD-9-CM	Deep phlebothrombosis, postpartum, with delivery
67151	Diagnosis	ICD-9-CM	Other phlebitis and thrombosis with delivery, with or without mention of antepartum condition
67152	Diagnosis	ICD-9-CM	Other phlebitis and thrombosis with delivery, with mention of postpartum complication
67181	Diagnosis	ICD-9-CM	Other venous complication, with delivery, with or without mention of antepartum condition
67182	Diagnosis	ICD-9-CM	Other venous complication, with delivery, with mention of postpartum complication
67191	Diagnosis	ICD-9-CM	Unspecified venous complication, with delivery, with or without mention of antepartum condition
67192	Diagnosis	ICD-9-CM	Unspecified venous complication, with delivery, with mention of postpartum complication
67202	Diagnosis	ICD-9-CM	Puerperal pyrexia of unknown origin, delivered, with mention of postpartum complication
67301	Diagnosis	ICD-9-CM	Obstetrical air embolism, with delivery, with or without mention of antepartum condition
67302	Diagnosis	ICD-9-CM	Obstetrical air embolism, with delivery, with mention of postpartum complication
67311	Diagnosis	ICD-9-CM	Amniotic fluid embolism, with delivery, with or without mention of antepartum condition
67312	Diagnosis	ICD-9-CM	Amniotic fluid embolism, with delivery, with mention of postpartum complication
67321	Diagnosis	ICD-9-CM	Obstetrical blood-clot embolism, with delivery, with or without mention of antepartum condition
67322	Diagnosis	ICD-9-CM	Obstetrical blood-clot embolism, with mention of postpartum complication
67331	Diagnosis	ICD-9-CM	Obstetrical pyemic and septic embolism, with delivery, with or without mention of antepartum condition
67332	Diagnosis	ICD-9-CM	Obstetrical pyemic and septic embolism, with delivery, with mention of postpartum complication
67381	Diagnosis	ICD-9-CM	Other obstetrical pulmonary embolism, with delivery, with or without mention of antepartum condition
67382	Diagnosis	ICD-9-CM	Other obstetrical pulmonary embolism, with delivery, with mention of postpartum complication
67401	Diagnosis	ICD-9-CM	Cerebrovascular disorder, with delivery, with or without mention of antepartum condition
67402	Diagnosis	ICD-9-CM	Cerebrovascular disorder, with delivery, with mention of postpartum complication
67412	Diagnosis	ICD-9-CM	Disruption of cesarean wound, with delivery, with mention of postpartum complication

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Full Term Delivery Codes

Code	Code Category	Code Type	Description
67422	Diagnosis	ICD-9-CM	Disruption of perineal wound, with delivery, with mention of postpartum complication
67432	Diagnosis	ICD-9-CM	Other complication of obstetrical surgical wounds, with delivery, with mention of postpartum complication
67442	Diagnosis	ICD-9-CM	Placental polyp, with delivery, with mention of postpartum complication
67451	Diagnosis	ICD-9-CM	Peripartum cardiomyopathy, delivered, with or without mention of antepartum condition
67452	Diagnosis	ICD-9-CM	Peripartum cardiomyopathy, delivered, with mention of postpartum condition
67482	Diagnosis	ICD-9-CM	Other complication of puerperium, with delivery, with mention of postpartum complication
67492	Diagnosis	ICD-9-CM	Unspecified complications of puerperium, with delivery, with mention of postpartum complication
67501	Diagnosis	ICD-9-CM	Infection of nipple associated with childbirth, delivered, with or without mention of antepartum condition
67502	Diagnosis	ICD-9-CM	Infection of nipple associated with childbirth, delivered with mention of postpartum complication
67511	Diagnosis	ICD-9-CM	Abscess of breast associated with childbirth, delivered, with or without mention of antepartum condition
67512	Diagnosis	ICD-9-CM	Abscess of breast associated with childbirth, delivered, with mention of postpartum complication
67521	Diagnosis	ICD-9-CM	Nonpurulent mastitis, delivered, with or without mention of antepartum condition
67522	Diagnosis	ICD-9-CM	Nonpurulent mastitis, delivered, with mention of postpartum complication
67581	Diagnosis	ICD-9-CM	Other specified infection of the breast and nipple associated with childbirth, delivered, with or without mention of antepartum condition
67582	Diagnosis	ICD-9-CM	Other specified infection of the breast and nipple associated with childbirth, delivered, with mention of postpartum complication
67591	Diagnosis	ICD-9-CM	Unspecified infection of the breast and nipple, delivered, with or without mention of antepartum condition
67592	Diagnosis	ICD-9-CM	Unspecified infection of the breast and nipple, delivered, with mention of postpartum complication
67601	Diagnosis	ICD-9-CM	Retracted nipple, delivered, with or without mention of antepartum condition
67602	Diagnosis	ICD-9-CM	Retracted nipple, delivered, with mention of postpartum complication
67611	Diagnosis	ICD-9-CM	Cracked nipple, delivered, with or without mention of antepartum condition
67612	Diagnosis	ICD-9-CM	Cracked nipple, delivered, with mention of postpartum complication
67621	Diagnosis	ICD-9-CM	Engorgement of breasts, delivered, with or without mention of antepartum condition
67622	Diagnosis	ICD-9-CM	Engorgement of breasts, delivered, with mention of postpartum complication
67631	Diagnosis	ICD-9-CM	Other and unspecified disorder of breast associated with childbirth, delivered, with or without mention of antepartum condition
67632	Diagnosis	ICD-9-CM	Other and unspecified disorder of breast associated with childbirth, delivered, with mention of postpartum complication
67641	Diagnosis	ICD-9-CM	Failure of lactation, with delivery, with or without mention of antepartum condition
67642	Diagnosis	ICD-9-CM	Failure of lactation, with delivery, with mention of postpartum complication
67651	Diagnosis	ICD-9-CM	Suppressed lactation, with delivery, with or without mention of antepartum condition
67652	Diagnosis	ICD-9-CM	Suppressed lactation, with delivery, with mention of postpartum complication
67661	Diagnosis	ICD-9-CM	Galactorrhea, with delivery, with or without mention of antepartum condition
67662	Diagnosis	ICD-9-CM	Galactorrhea, with delivery, with mention of postpartum complication
67681	Diagnosis	ICD-9-CM	Other disorder of lactation, with delivery, with or without mention of antepartum condition
67682	Diagnosis	ICD-9-CM	Other disorder of lactation, with delivery, with mention of postpartum complication
67691	Diagnosis	ICD-9-CM	Unspecified disorder of lactation, with delivery, with or without mention of antepartum condition
67692	Diagnosis	ICD-9-CM	Unspecified disorder of lactation, with delivery, with mention of postpartum complication
67801	Diagnosis	ICD-9-CM	Fetal hematologic conditions, delivered, with or without mention of antepartum condition

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
67811	Diagnosis	ICD-9-CM	Fetal conjoined twins, delivered, with or without mention of antepartum condition
67901	Diagnosis	ICD-9-CM	Maternal complications from in utero procedure, delivered, with or without mention of antepartum condition
67902	Diagnosis	ICD-9-CM	Maternal complications from in utero procedure, delivered, with mention of postpartum complication
67911	Diagnosis	ICD-9-CM	Fetal complications from in utero procedure, delivered, with or without mention of antepartum condition
67912	Diagnosis	ICD-9-CM	Fetal complications from in utero procedure, delivered, with mention of postpartum complication
72	Procedure	ICD-9-CM	Forceps, vacuum, and breech delivery
720	Procedure	ICD-9-CM	Low forceps operation
721	Procedure	ICD-9-CM	Low forceps operation with episiotomy
722	Procedure	ICD-9-CM	Mid forceps operation
7221	Procedure	ICD-9-CM	Mid forceps operation with episiotomy
7229	Procedure	ICD-9-CM	Other mid forceps operation
723	Procedure	ICD-9-CM	High forceps operation
7231	Procedure	ICD-9-CM	High forceps operation with episiotomy
7239	Procedure	ICD-9-CM	Other high forceps operation
724	Procedure	ICD-9-CM	Forceps rotation of fetal head
725	Procedure	ICD-9-CM	Breech extraction
7251	Procedure	ICD-9-CM	Partial breech extraction with forceps to aftercoming head
7252	Procedure	ICD-9-CM	Other partial breech extraction
7253	Procedure	ICD-9-CM	Total breech extraction with forceps to aftercoming head
7254	Procedure	ICD-9-CM	Other total breech extraction
726	Procedure	ICD-9-CM	Forceps application to aftercoming head
727	Procedure	ICD-9-CM	Vacuum extraction
7271	Procedure	ICD-9-CM	Vacuum extraction with episiotomy
7279	Procedure	ICD-9-CM	Other vacuum extraction
728	Procedure	ICD-9-CM	Other specified instrumental delivery
729	Procedure	ICD-9-CM	Unspecified instrumental delivery
73	Procedure	ICD-9-CM	Artificial rupture of membranes
730	Procedure	ICD-9-CM	Other procedures inducing or assisting delivery
7301	Procedure	ICD-9-CM	Induction of labor by artificial rupture of membranes
7309	Procedure	ICD-9-CM	Other artificial rupture of membranes
731	Procedure	ICD-9-CM	Other surgical induction of labor
732	Procedure	ICD-9-CM	Internal and combined version and extraction
7321	Procedure	ICD-9-CM	Internal and combined version without extraction
7322	Procedure	ICD-9-CM	Internal and combined version with extraction
733	Procedure	ICD-9-CM	Failed forceps
734	Procedure	ICD-9-CM	Medical induction of labor
735	Procedure	ICD-9-CM	Manually assisted delivery

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Full Term Delivery Codes

Code	Code Category	Code Type	Description
7351	Procedure	ICD-9-CM	Manual rotation of fetal head
7359	Procedure	ICD-9-CM	Other manually assisted delivery
736	Procedure	ICD-9-CM	Episiotomy
738	Procedure	ICD-9-CM	Operations on fetus to facilitate delivery
739	Procedure	ICD-9-CM	Other operations assisting delivery
7391	Procedure	ICD-9-CM	External version to assist delivery
7392	Procedure	ICD-9-CM	Replacement of prolapsed umbilical cord
7393	Procedure	ICD-9-CM	Incision of cervix to assist delivery
7394	Procedure	ICD-9-CM	Pubiotomy to assist delivery
7399	Procedure	ICD-9-CM	Other operations to assist delivery
740	Procedure	ICD-9-CM	Classical cesarean section
741	Procedure	ICD-9-CM	Low cervical cesarean section
742	Procedure	ICD-9-CM	Extraperitoneal cesarean section
744	Procedure	ICD-9-CM	Cesarean section of other specified type
749	Procedure	ICD-9-CM	Cesarean section of unspecified type
7499	Procedure	ICD-9-CM	Other cesarean section of unspecified type
7630	Diagnosis	ICD-9-CM	Fetus or newborn affected by breech delivery and extraction
7632	Diagnosis	ICD-9-CM	Fetus or newborn affected by forceps delivery
7633	Diagnosis	ICD-9-CM	Fetus or newborn affected by delivery by vacuum extractor
7634	Diagnosis	ICD-9-CM	Fetus or newborn affected by cesarean delivery
7636	Diagnosis	ICD-9-CM	Fetus or newborn affected by precipitate delivery
7680	Diagnosis	ICD-9-CM	Fetal death from asphyxia or anoxia before onset of labor or at unspecified time
7681	Diagnosis	ICD-9-CM	Fetal death from asphyxia or anoxia during labor
V27	Diagnosis	ICD-9-CM	Outcome of delivery
V270	Diagnosis	ICD-9-CM	Outcome of delivery, single liveborn
V271	Diagnosis	ICD-9-CM	Outcome of delivery, single stillborn
V272	Diagnosis	ICD-9-CM	Outcome of delivery, twins, both liveborn
V273	Diagnosis	ICD-9-CM	Outcome of delivery, twins, one liveborn and one stillborn
V274	Diagnosis	ICD-9-CM	Outcome of delivery, twins, both stillborn
V275	Diagnosis	ICD-9-CM	Outcome of delivery, other multiple birth, all liveborn
V276	Diagnosis	ICD-9-CM	Outcome of delivery, other multiple birth, some liveborn
V277	Diagnosis	ICD-9-CM	Outcome of delivery, other multiple birth, all stillborn
V279	Diagnosis	ICD-9-CM	Outcome of delivery, unspecified
V30	Diagnosis	ICD-9-CM	Single liveborn
V300	Diagnosis	ICD-9-CM	Single liveborn, born in hospital
V3000	Diagnosis	ICD-9-CM	Single liveborn, born in hospital, delivered without mention of cesarean delivery
V3001	Diagnosis	ICD-9-CM	Single liveborn, born in hospital, delivered by cesarean delivery

Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
V301	Diagnosis	ICD-9-CM	Single liveborn, born before admission to hospital
V302	Diagnosis	ICD-9-CM	Single liveborn, born outside hospital and not hospitalized
V31	Diagnosis	ICD-9-CM	Twin birth, mate liveborn
V310	Diagnosis	ICD-9-CM	Twin, mate liveborn, born in hospital
V3100	Diagnosis	ICD-9-CM	Twin, mate liveborn, born in hospital, delivered without mention of cesarean delivery
V3101	Diagnosis	ICD-9-CM	Twin, mate liveborn, born in hospital, delivered by cesarean delivery
V311	Diagnosis	ICD-9-CM	Twin birth, mate liveborn, born before admission to hospital
V312	Diagnosis	ICD-9-CM	Twin birth, mate liveborn, born outside hospital and not hospitalized
V32	Diagnosis	ICD-9-CM	Twin birth, mate stillborn
V320	Diagnosis	ICD-9-CM	Twin, mate stillborn, born in hospital
V3200	Diagnosis	ICD-9-CM	Twin, mate stillborn, born in hospital, delivered without mention of cesarean delivery
V3201	Diagnosis	ICD-9-CM	Twin, mate stillborn, born in hospital, delivered by cesarean delivery
V321	Diagnosis	ICD-9-CM	Twin birth, mate stillborn, born before admission to hospital
V322	Diagnosis	ICD-9-CM	Twin birth, mate stillborn, born outside hospital and not hospitalized
V33	Diagnosis	ICD-9-CM	Twin birth, unspecified whether mate liveborn or stillborn
V330	Diagnosis	ICD-9-CM	Twin, unspecified, born in hospital
V3300	Diagnosis	ICD-9-CM	Twin, unspecified whether mate stillborn or liveborn, born in hospital, delivered without mention of cesarean delivery
V3301	Diagnosis	ICD-9-CM	Twin, unspecified whether mate stillborn or liveborn, born in hospital, delivered by cesarean delivery
V331	Diagnosis	ICD-9-CM	Twin birth, unspecified whether mate liveborn or stillborn, born before admission to hospital
V332	Diagnosis	ICD-9-CM	Twin birth, unspecified whether mate liveborn or stillborn, born outside hospital and not hospitalized
V34	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates all liveborn
V340	Diagnosis	ICD-9-CM	Other multiple, mates all liveborn, born in hospital
V3400	Diagnosis	ICD-9-CM	Other multiple, mates all liveborn, born in hospital, delivered without mention of cesarean delivery
V3401	Diagnosis	ICD-9-CM	Other multiple, mates all liveborn, born in hospital, delivered by cesarean delivery
V341	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates all liveborn, born before admission to hospital
V342	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates all liveborn, born outside hospital and not hospitalized
V35	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates all stillborn
V350	Diagnosis	ICD-9-CM	Other multiple, mates all stillborn, born in hospital
V3500	Diagnosis	ICD-9-CM	Other multiple, mates all stillborn, born in hospital, delivered without mention of cesarean delivery
V3501	Diagnosis	ICD-9-CM	Other multiple, mates all stillborn, born in hospital, delivered by cesarean delivery
V351	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates all stillborn, born before admission to hospital
V352	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates all stillborn, born outside of hospital and not hospitalized
V36	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates liveborn and stillborn
V360	Diagnosis	ICD-9-CM	Other multiple, mates liveborn and stillborn, born in hospital
V3600	Diagnosis	ICD-9-CM	Other multiple, mates liveborn and stillborn, born in hospital, delivered without mention of cesarean delivery
V3601	Diagnosis	ICD-9-CM	Other multiple, mates liveborn and stillborn, born in hospital, delivered by cesarean delivery
V361	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates liveborn and stillborn, born before admission to hospital

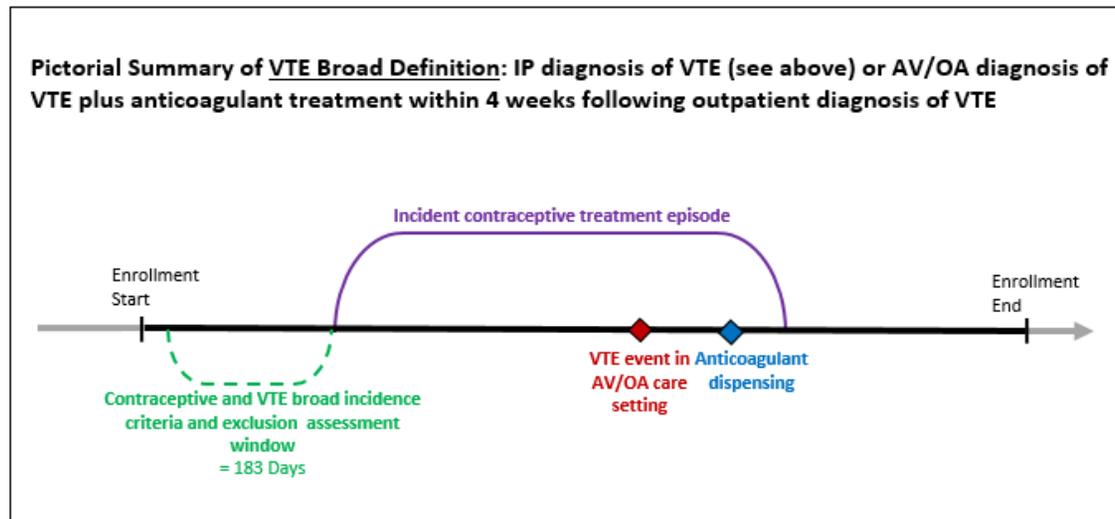
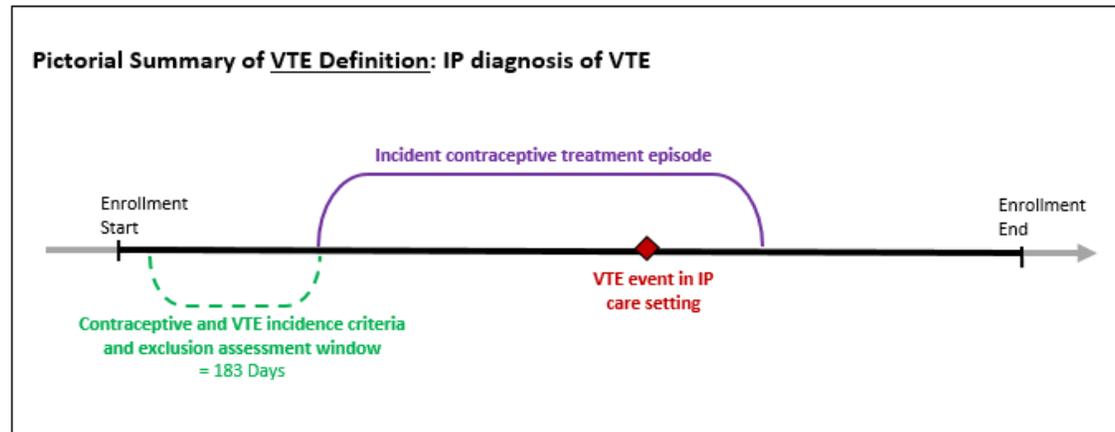
Appendix E: List of Diagnosis and Procedure Codes used to Define Liveborn Deliveries

Full Term Delivery Codes

Code	Code Category	Code Type	Description
V362	Diagnosis	ICD-9-CM	Other multiple birth (three or more), mates liveborn and stillborn, born outside hospital and not hospitalized
V37	Diagnosis	ICD-9-CM	Other multiple birth (three or more), unspecified whether mates liveborn or stillborn
V370	Diagnosis	ICD-9-CM	Other multiple, unspecified whether mates stillborn or liveborn, born in hospital
V3700	Diagnosis	ICD-9-CM	Other multiple, unspecified whether mates stillborn or liveborn, born in hospital, delivered without mention of cesarean delivery
V3701	Diagnosis	ICD-9-CM	Other multiple, unspecified whether mates stillborn or liveborn, born in hospital, delivered by cesarean delivery
V371	Diagnosis	ICD-9-CM	Other multiple birth (three or more), unspecified whether mates liveborn or stillborn, born before admission to hospital
V372	Diagnosis	ICD-9-CM	Other multiple birth (three or more), unspecified whether mates liveborn or stillborn, born outside of hospital
V39	Diagnosis	ICD-9-CM	Liveborn, unspecified whether single, twin, or multiple
V390	Diagnosis	ICD-9-CM	Other liveborn, unspecified whether single, twin, or multiple, born in hospital
V3900	Diagnosis	ICD-9-CM	Liveborn infant, unspecified whether single, twin, or multiple, born in hospital, delivered without mention of cesarean delivery
V3901	Diagnosis	ICD-9-CM	Liveborn infant, unspecified whether single, twin, or multiple, born in hospital, delivered by cesarean
V391	Diagnosis	ICD-9-CM	Liveborn, unspecified whether single, twin or multiple, born before admission to hospital
V392	Diagnosis	ICD-9-CM	Liveborn, unspecified whether single, twin or multiple, born outside hospital and not hospitalized

Appendix F: List of Diagnosis Codes Used to Define Venous Thromboembolism

Code	Code Category	Code Type	Description
415.1	Diagnosis	ICD-9-CM	Pulmonary embolism and infarction
415.1*	Diagnosis	ICD-9-CM	Pulmonary embolism and infarction
453	Diagnosis	ICD-9-CM	Other venous embolism and thrombosis
453*	Diagnosis	ICD-9-CM	Other venous embolism and thrombosis
453**	Diagnosis	ICD-9-CM	Other venous embolism and thrombosis



Appendix G: List of Covariates included in Tables 1a and 1b

Covariates for Propensity Score Estimation	
Covariate Group	Conditions/Descriptions
Age	Continuous age (Adjust for actual age at baseline)
Calendar year	Year of index date
Prior use of non-study hormonal contraceptives	Any non-study combined hormonal contraceptive use (at baseline; estrogen and progestin combination drugs of any administration route; excluding progestin-only products)
Prior use of other study combined oral contraceptives (COCs)	Any other study COC use (at baseline; cyclic COC use for new users of Lybrel or extended COCs; Lybrel or extended COC use for new users of cyclic COCs; cyclic COC or extended COC use for new users of Lybrel; Lybrel or cyclic COC use for new users of extended COCs)
Gynecological conditions	Uterine leiomyoma
	Inflammatory disease of the female pelvic organs
	Disorders of female genital tract
	Endometriosis
	Ovarian cyst, Polycystic ovarian and related symptoms (hirsutism, acne, disorder menstruation)
	Premenstrual tension syndromes
	Menorrhagia
Hypercoagulable states and coagulation defects	Migraine
	Primary hypercoagulable state
	Sulfur bearing amino acid metabolism disturbances
	Congenital deficiency of clotting factors (dysfibrinogenemia)
	Secondary hypercoagulable state
Cardiovascular and metabolic conditions	Defibrination syndrome
	Metabolic syndrome
	Hyperlipidemia
	Diabetes mellitus
Cardiac conditions	Hypertension
	Congenital heart disease
	Congestive heart failure
Venous catheterization	Varicose vein
	Central venous catheter
	Peripherally inserted central catheter
Renal conditions	Central venous catheter placement with guidance
	chronic kidney disease
Inflammatory conditions	Inflammatory bowel disease
	Irritable bowel syndrome
	Rheumatoid arthritis
	Systemic lupus erythematosus
	Psoriasis
Obesity and overweight	
Tobacco use	
Immobility	Fracture of skull, spine and lower limb trunk
	Extracranial injury

Appendix G: List of Covariates included in Tables 1a and 1b

Covariates for Propensity Score Estimation	
Covariate Group	Conditions/Descriptions
	Crushing injury
	Burns (>10% body surface)
	Spinal cord injury
	Spina bifida
	Paralysis
	Casting: halo, hip spica, long leg
Surgery	Renal exploration or drainage
	Repair of anomalous vessels of kidney
	Procedures of renal pelvis
	Nephrectomy
	Open surgical procedures of the kidney
	Open repairs urinary system
	Nephrectomy
	Myomectomy
	Open procedures fallopian tubes with/without ovaries
	Open procedure ovary
	Removal ovary with/without multiple procedures for malignancy
	Tubal pregnancy, hysterotomy procedures
	Anesthesia for intraperitoneal procedures in upper abdomen including laparoscopy; gastric restrictive procedure for morbid obesity
	Laparoscopic gastric bypass with small bowel resection
	Laparoscopic bariatric procedures
	Open bariatric procedure for morbid obesity
	Bariatric procedures: removal, replacement, revision port components
	Enterolysis, enterectomy
	Colon resection
	Open repair procedures of intestine
	Open and transrectal procedures of rectum
	Resection of anal fistula
	Anal repairs
	Hepatectomy
	Open repair of liver
	Open procedures of the pancreas
	Exploratory and drainage procedures: abdomen and peritoneum
	Resection of presacral/sacrococcygeal tumor
	Surgical repair abdominal wall
	Open excision of large and small intestine, total abdominal colectomy, intestinal anastomosis
Other repair of intestine	
Resection or repair of rectum, repair of fistula	
Hepatectomy, repair of liver	

Appendix G: List of Covariates included in Tables 1a and 1b

Covariates for Propensity Score Estimation	
Covariate Group	Conditions/Descriptions
	Exploratory laparotomy
	Craniectomy/craniotomy
	Lobectomy, hemispherectomy
	Craniotomy for hypophysectomy, pituitary tumor
	Removal of foreign body from brain
	Surgical treatment of arteriovenous malformation
	Surgical treatment brain aneurysm
	Craniotomy, craniectomy
	Incision, bone cortex, pelvis and/or hip (e.g. Osteomyelitis or bone abscess)
	Procedures of bones and joints of hip and pelvis
	Radical resection of bone tumor of hip/pelvis
	Revision/reconstruction of hip and pelvis (e.g. Slipped femoral epiphysis, hip arthroplasty)
	Open treatment of fracture/dislocation of hip/pelvis
	Knee arthroplasty
	Open treatment of fracture/dislocation of femur/knee
	Revision of hip and knee replacement
	Application of external fixator device (pins/wires, screws into bone), internal fixation
	Open reduction of dislocation of hip or knee
	Joint replacement lower extremity
	Partial resection vertebral component
	Spinal fusion: lateral extracavitary approach
	Spinal fusion: anterior and posterior approach
	Procedures to correct anomalous spinal vertebrae
	Spinal instrumentation: segmental/non-segmental
	Vertebral corpectomy
	Exploration and decompression of spinal canal structures
	Meningocele and myelomeningocele repair
	Spinal fusion
Medical Utilization Metrics	Number of 1) inpatient stays, 2) outpatient visits, 3) emergency department visits, 4) institutional stays, and 5) other ambulatory encounters
Drug Utilization Metrics	Number of 1) dispensings, 2) unique generics dispensed, and 3) unique drug classes dispensed

Covariates for Descriptive Purposes Only (did not enter Propensity Score model)	
Covariate Group	Condition/Description
Sickle cell anemia	
Cystic fibrosis	
Cerebral palsy	
Thoracic outlet syndrome	
Infection diseases	Sepsis
	Osteomyelitis

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Cardiac conditions	428.0	Diagnosis	ICD-9-CM	Congestive heart failure, unspecified
Cardiac conditions	454	Diagnosis	ICD-9-CM	Varicose veins of lower extremities
Cardiac conditions	454.0	Diagnosis	ICD-9-CM	Varicose veins of lower extremities with ulcer
Cardiac conditions	454.1	Diagnosis	ICD-9-CM	Varicose veins of lower extremities with inflammation
Cardiac conditions	454.2	Diagnosis	ICD-9-CM	Varicose veins of lower extremities with ulcer and inflammation
Cardiac conditions	454.8	Diagnosis	ICD-9-CM	Varicose veins of the lower extremities with other complications
Cardiac conditions	454.9	Diagnosis	ICD-9-CM	Asymptomatic varicose veins
Cardiac conditions	456	Diagnosis	ICD-9-CM	Varicose veins of other sites
Cardiac conditions	671.0	Diagnosis	ICD-9-CM	Varicose veins of legs in pregnancy and the puerperium
Cardiac conditions	671.00	Diagnosis	ICD-9-CM	Varicose veins of legs complicating pregnancy and the puerperium, unspecified as to episode of care
Cardiac conditions	671.01	Diagnosis	ICD-9-CM	Varicose veins of legs, with delivery, with or without mention of antepartum condition
Cardiac conditions	671.02	Diagnosis	ICD-9-CM	Varicose veins of legs, with delivery, with mention of postpartum complication
Cardiac conditions	671.03	Diagnosis	ICD-9-CM	Varicose veins of legs, antepartum
Cardiac conditions	671.04	Diagnosis	ICD-9-CM	Varicose veins of legs, postpartum condition or complication
Cardiac conditions	671.1	Diagnosis	ICD-9-CM	Varicose veins of vulva and perineum in pregnancy and the puerperium
Cardiac conditions	671.10	Diagnosis	ICD-9-CM	Varicose veins of vulva and perineum complicating pregnancy and the puerperium, unspecified as to episode of care
Cardiac conditions	671.11	Diagnosis	ICD-9-CM	Varicose veins of vulva and perineum, with delivery, with or without mention of antepartum condition
Cardiac conditions	671.12	Diagnosis	ICD-9-CM	Varicose veins of vulva and perineum, with delivery, with mention of postpartum complication
Cardiac conditions	671.13	Diagnosis	ICD-9-CM	Varicose veins of vulva and perineum, antepartum
Cardiac conditions	671.14	Diagnosis	ICD-9-CM	Varicose veins of vulva and perineum, postpartum condition or complication
Cardiac conditions	745	Diagnosis	ICD-9-CM	Bulbus cordis anomalies and anomalies of cardiac septal closure
Cardiac conditions	745.0	Diagnosis	ICD-9-CM	Bulbus cordis anomalies and anomalies of cardiac septal closure, common truncus
Cardiac conditions	745.1	Diagnosis	ICD-9-CM	Transposition of great vessels
Cardiac conditions	745.2	Diagnosis	ICD-9-CM	Tetralogy of Fallot
Cardiac conditions	745.3	Diagnosis	ICD-9-CM	Bulbus cordis anomalies and anomalies of cardiac septal closure, common ventricle
Cardiac conditions	745.4	Diagnosis	ICD-9-CM	Ventricular septal defect
Cardiac conditions	745.5	Diagnosis	ICD-9-CM	Ostium secundum type atrial septal defect
Cardiac conditions	745.6	Diagnosis	ICD-9-CM	Endocardial cushion defects
Cardiac conditions	745.7	Diagnosis	ICD-9-CM	Cor biloculare
Cardiac conditions	745.8	Diagnosis	ICD-9-CM	Other bulbus cordis anomalies and anomalies of cardiac septal closure
Cardiac conditions	745.9	Diagnosis	ICD-9-CM	Unspecified congenital defect of septal closure
Cardiac conditions	746	Diagnosis	ICD-9-CM	Other congenital anomalies of heart
Cardiac conditions	746.0	Diagnosis	ICD-9-CM	Congenital anomalies of pulmonary valve
Cardiac conditions	746.1	Diagnosis	ICD-9-CM	Congenital tricuspid atresia and stenosis
Cardiac conditions	746.2	Diagnosis	ICD-9-CM	Ebstein's anomaly
Cardiac conditions	746.3	Diagnosis	ICD-9-CM	Congenital stenosis of aortic valve
Cardiac conditions	746.4	Diagnosis	ICD-9-CM	Congenital insufficiency of aortic valve
Cardiac conditions	746.5	Diagnosis	ICD-9-CM	Congenital mitral stenosis
Cardiac conditions	746.6	Diagnosis	ICD-9-CM	Congenital mitral insufficiency
Cardiac conditions	746.7	Diagnosis	ICD-9-CM	Hypoplastic left heart syndrome
Cardiac conditions	746.8	Diagnosis	ICD-9-CM	Other specified congenital anomaly of heart
Cardiac conditions	746.9	Diagnosis	ICD-9-CM	Unspecified congenital anomaly of heart
Cardiac conditions	747	Diagnosis	ICD-9-CM	Other congenital anomalies of circulatory system
Cardiac conditions	747.0	Diagnosis	ICD-9-CM	Patent ductus arteriosus
Cardiac conditions	747.1	Diagnosis	ICD-9-CM	Coarctation of aorta
Cardiac conditions	747.2	Diagnosis	ICD-9-CM	Other congenital anomaly of aorta
Cardiac conditions	747.3	Diagnosis	ICD-9-CM	Anomalies of pulmonary artery
Cardiac conditions	747.4	Diagnosis	ICD-9-CM	Congenital anomalies of great veins

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Cardiac conditions	747.5	Diagnosis	ICD-9-CM	Congenital absence or hypoplasia of umbilical artery
Cardiac conditions	747.6	Diagnosis	ICD-9-CM	Other congenital anomaly of peripheral vascular system
Cardiac conditions	747.8	Diagnosis	ICD-9-CM	Other specified congenital anomalies of circulatory system
Cardiac conditions	747.9	Diagnosis	ICD-9-CM	Unspecified congenital anomaly of circulatory system
Cardiovascular and metabolic conditions	250	Diagnosis	ICD-9-CM	Diabetes mellitus
Cardiovascular and metabolic conditions	250.0	Diagnosis	ICD-9-CM	Diabetes mellitus without mention of complication
Cardiovascular and metabolic conditions	250.1	Diagnosis	ICD-9-CM	Diabetes with ketoacidosis
Cardiovascular and metabolic conditions	250.2	Diagnosis	ICD-9-CM	Diabetes with hyperosmolarity
Cardiovascular and metabolic conditions	250.3	Diagnosis	ICD-9-CM	Diabetes with other coma
Cardiovascular and metabolic conditions	250.4	Diagnosis	ICD-9-CM	Diabetes with renal manifestations
Cardiovascular and metabolic conditions	250.5	Diagnosis	ICD-9-CM	Diabetes with ophthalmic manifestations
Cardiovascular and metabolic conditions	250.6	Diagnosis	ICD-9-CM	Diabetes with neurological manifestations
Cardiovascular and metabolic conditions	250.7	Diagnosis	ICD-9-CM	Diabetes with peripheral circulatory disorders
Cardiovascular and metabolic conditions	250.8	Diagnosis	ICD-9-CM	Diabetes with other specified manifestations
Cardiovascular and metabolic conditions	250.9	Diagnosis	ICD-9-CM	Diabetes with unspecified complication
Cardiovascular and metabolic conditions	272.0	Diagnosis	ICD-9-CM	Pure hypercholesterolemia
Cardiovascular and metabolic conditions	272.1	Diagnosis	ICD-9-CM	Pure hyperglyceridemia
Cardiovascular and metabolic conditions	272.2	Diagnosis	ICD-9-CM	Mixed hyperlipidemia
Cardiovascular and metabolic conditions	272.3	Diagnosis	ICD-9-CM	Hyperchylomicronemia
Cardiovascular and metabolic conditions	272.4	Diagnosis	ICD-9-CM	Other and unspecified hyperlipidemia
Cardiovascular and metabolic conditions	277.7	Diagnosis	ICD-9-CM	Dysmetabolic Syndrome X
Cardiovascular and metabolic conditions	357.2	Diagnosis	ICD-9-CM	Polyneuropathy in diabetes
Cardiovascular and metabolic conditions	362.0	Diagnosis	ICD-9-CM	Diabetic retinopathy
Cardiovascular and metabolic conditions	362.01	Diagnosis	ICD-9-CM	Background diabetic retinopathy
Cardiovascular and metabolic conditions	362.02	Diagnosis	ICD-9-CM	Proliferative diabetic retinopathy
Cardiovascular and metabolic conditions	362.03	Diagnosis	ICD-9-CM	Nonproliferative diabetic retinopathy NOS
Cardiovascular and metabolic conditions	362.04	Diagnosis	ICD-9-CM	Mild nonproliferative diabetic retinopathy
Cardiovascular and metabolic conditions	362.05	Diagnosis	ICD-9-CM	Moderate nonproliferative diabetic retinopathy
Cardiovascular and metabolic conditions	362.06	Diagnosis	ICD-9-CM	Severe nonproliferative diabetic retinopathy
Cardiovascular and metabolic conditions	362.07	Diagnosis	ICD-9-CM	Diabetic macular edema
Cardiovascular and metabolic conditions	401	Diagnosis	ICD-9-CM	Essential hypertension
Cardiovascular and metabolic conditions	401.0	Diagnosis	ICD-9-CM	Essential hypertension, malignant
Cardiovascular and metabolic conditions	401.1	Diagnosis	ICD-9-CM	Essential hypertension, benign
Cardiovascular and metabolic conditions	401.9	Diagnosis	ICD-9-CM	Unspecified essential hypertension
Cardiovascular and metabolic conditions	402	Diagnosis	ICD-9-CM	Hypertensive heart disease
Cardiovascular and metabolic conditions	402.0	Diagnosis	ICD-9-CM	Malignant hypertensive heart disease
Cardiovascular and metabolic conditions	402.1	Diagnosis	ICD-9-CM	Benign hypertensive heart disease
Cardiovascular and metabolic conditions	402.9	Diagnosis	ICD-9-CM	Unspecified hypertensive heart disease
Cardiovascular and metabolic conditions	403	Diagnosis	ICD-9-CM	Hypertensive chronic kidney disease
Cardiovascular and metabolic conditions	403.0	Diagnosis	ICD-9-CM	Hypertensive chronic kidney disease, malignant
Cardiovascular and metabolic conditions	403.1	Diagnosis	ICD-9-CM	Hypertensive chronic kidney disease, benign
Cardiovascular and metabolic conditions	403.9	Diagnosis	ICD-9-CM	Hypertensive chronic kidney disease, unspecified
Cardiovascular and metabolic conditions	404	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease
Cardiovascular and metabolic conditions	404.0	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, malignant
Cardiovascular and metabolic conditions	404.1	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, benign
Cardiovascular and metabolic conditions	404.9	Diagnosis	ICD-9-CM	Hypertensive heart and chronic kidney disease, unspecified
Cardiovascular and metabolic conditions	405	Diagnosis	ICD-9-CM	Secondary hypertension
Cardiovascular and metabolic conditions	405.0	Diagnosis	ICD-9-CM	Secondary hypertension, malignant

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Cardiovascular and metabolic conditions	405.1	Diagnosis	ICD-9-CM	Secondary hypertension, benign
Cardiovascular and metabolic conditions	405.9	Diagnosis	ICD-9-CM	Unspecified secondary hypertension, unspecified
Cardiovascular and metabolic conditions	410	Diagnosis	ICD-9-CM	Acute myocardial infarction
Cardiovascular and metabolic conditions	410.0	Diagnosis	ICD-9-CM	Acute myocardial infarction of anterolateral wall
Cardiovascular and metabolic conditions	410.00	Diagnosis	ICD-9-CM	Acute myocardial infarction of anterolateral wall, episode of care unspecified
Cardiovascular and metabolic conditions	410.01	Diagnosis	ICD-9-CM	Acute myocardial infarction of anterolateral wall, initial episode of care
Cardiovascular and metabolic conditions	410.02	Diagnosis	ICD-9-CM	Acute myocardial infarction of anterolateral wall, subsequent episode of care
Cardiovascular and metabolic conditions	410.1	Diagnosis	ICD-9-CM	Acute myocardial infarction of other anterior wall
Cardiovascular and metabolic conditions	410.10	Diagnosis	ICD-9-CM	Acute myocardial infarction of other anterior wall, episode of care unspecified
Cardiovascular and metabolic conditions	410.11	Diagnosis	ICD-9-CM	Acute myocardial infarction of other anterior wall, initial episode of care
Cardiovascular and metabolic conditions	410.12	Diagnosis	ICD-9-CM	Acute myocardial infarction of other anterior wall, subsequent episode of care
Cardiovascular and metabolic conditions	410.2	Diagnosis	ICD-9-CM	Acute myocardial infarction of inferolateral wall
Cardiovascular and metabolic conditions	410.20	Diagnosis	ICD-9-CM	Acute myocardial infarction of inferolateral wall, episode of care unspecified
Cardiovascular and metabolic conditions	410.21	Diagnosis	ICD-9-CM	Acute myocardial infarction of inferolateral wall, initial episode of care
Cardiovascular and metabolic conditions	410.22	Diagnosis	ICD-9-CM	Acute myocardial infarction of inferolateral wall, subsequent episode of care
Cardiovascular and metabolic conditions	410.3	Diagnosis	ICD-9-CM	Acute myocardial infarction of inferoposterior wall
Cardiovascular and metabolic conditions	410.30	Diagnosis	ICD-9-CM	Acute myocardial infarction of inferoposterior wall, episode of care unspecified
Cardiovascular and metabolic conditions	410.31	Diagnosis	ICD-9-CM	Acute myocardial infarction of inferoposterior wall, initial episode of care
Cardiovascular and metabolic conditions	410.32	Diagnosis	ICD-9-CM	Acute myocardial infarction of inferoposterior wall, subsequent episode of care
Cardiovascular and metabolic conditions	410.4	Diagnosis	ICD-9-CM	Acute myocardial infarction of other inferior wall
Cardiovascular and metabolic conditions	410.40	Diagnosis	ICD-9-CM	Acute myocardial infarction of other inferior wall, episode of care unspecified
Cardiovascular and metabolic conditions	410.41	Diagnosis	ICD-9-CM	Acute myocardial infarction of other inferior wall, initial episode of care
Cardiovascular and metabolic conditions	410.42	Diagnosis	ICD-9-CM	Acute myocardial infarction of other inferior wall, subsequent episode of care
Cardiovascular and metabolic conditions	410.5	Diagnosis	ICD-9-CM	Acute myocardial infarction of other lateral wall
Cardiovascular and metabolic conditions	410.50	Diagnosis	ICD-9-CM	Acute myocardial infarction of other lateral wall, episode of care unspecified
Cardiovascular and metabolic conditions	410.51	Diagnosis	ICD-9-CM	Acute myocardial infarction of other lateral wall, initial episode of care
Cardiovascular and metabolic conditions	410.52	Diagnosis	ICD-9-CM	Acute myocardial infarction of other lateral wall, subsequent episode of care
Cardiovascular and metabolic conditions	410.6	Diagnosis	ICD-9-CM	Acute myocardial infarction, true posterior wall infarction
Cardiovascular and metabolic conditions	410.60	Diagnosis	ICD-9-CM	Acute myocardial infarction, true posterior wall infarction, episode of care unspecified
Cardiovascular and metabolic conditions	410.61	Diagnosis	ICD-9-CM	Acute myocardial infarction, true posterior wall infarction, initial episode of care
Cardiovascular and metabolic conditions	410.62	Diagnosis	ICD-9-CM	Acute myocardial infarction, true posterior wall infarction, subsequent episode of care
Cardiovascular and metabolic conditions	410.7	Diagnosis	ICD-9-CM	Acute myocardial infarction, subendocardial infarction
Cardiovascular and metabolic conditions	410.70	Diagnosis	ICD-9-CM	Acute myocardial infarction, subendocardial infarction, episode of care unspecified
Cardiovascular and metabolic conditions	410.71	Diagnosis	ICD-9-CM	Acute myocardial infarction, subendocardial infarction, initial episode of care
Cardiovascular and metabolic conditions	410.72	Diagnosis	ICD-9-CM	Acute myocardial infarction, subendocardial infarction, subsequent episode of care
Cardiovascular and metabolic conditions	410.8	Diagnosis	ICD-9-CM	Acute myocardial infarction of other specified sites
Cardiovascular and metabolic conditions	410.80	Diagnosis	ICD-9-CM	Acute myocardial infarction of other specified sites, episode of care unspecified
Cardiovascular and metabolic conditions	410.81	Diagnosis	ICD-9-CM	Acute myocardial infarction of other specified sites, initial episode of care
Cardiovascular and metabolic conditions	410.82	Diagnosis	ICD-9-CM	Acute myocardial infarction of other specified sites, subsequent episode of care
Cardiovascular and metabolic conditions	410.9	Diagnosis	ICD-9-CM	Acute myocardial infarction, unspecified site
Cardiovascular and metabolic conditions	410.90	Diagnosis	ICD-9-CM	Acute myocardial infarction, unspecified site, episode of care unspecified
Cardiovascular and metabolic conditions	410.91	Diagnosis	ICD-9-CM	Acute myocardial infarction, unspecified site, initial episode of care
Cardiovascular and metabolic conditions	410.92	Diagnosis	ICD-9-CM	Acute myocardial infarction, unspecified site, subsequent episode of care
Cardiovascular and metabolic conditions	411	Diagnosis	ICD-9-CM	Other acute and subacute forms of ischemic heart disease
Cardiovascular and metabolic conditions	411.0	Diagnosis	ICD-9-CM	Postmyocardial infarction syndrome
Cardiovascular and metabolic conditions	411.1	Diagnosis	ICD-9-CM	Intermediate coronary syndrome
Cardiovascular and metabolic conditions	411.8	Diagnosis	ICD-9-CM	Other acute and subacute forms of ischemic heart disease
Cardiovascular and metabolic conditions	411.81	Diagnosis	ICD-9-CM	Acute coronary occlusion without myocardial infarction

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Cardiovascular and metabolic conditions	411.89	Diagnosis	ICD-9-CM	Other acute and subacute form of ischemic heart disease
Cardiovascular and metabolic conditions	413	Diagnosis	ICD-9-CM	Angina pectoris
Cardiovascular and metabolic conditions	413.0	Diagnosis	ICD-9-CM	Angina decubitus
Cardiovascular and metabolic conditions	413.1	Diagnosis	ICD-9-CM	Prinzmetal angina
Cardiovascular and metabolic conditions	413.9	Diagnosis	ICD-9-CM	Other and unspecified angina pectoris
Cardiovascular and metabolic conditions	414	Diagnosis	ICD-9-CM	Other forms of chronic ischemic heart disease
Cardiovascular and metabolic conditions	414.0	Diagnosis	ICD-9-CM	Coronary atherosclerosis
Cardiovascular and metabolic conditions	414.00	Diagnosis	ICD-9-CM	Coronary atherosclerosis of unspecified type of vessel, native or graft
Cardiovascular and metabolic conditions	414.01	Diagnosis	ICD-9-CM	Coronary atherosclerosis of native coronary artery
Cardiovascular and metabolic conditions	414.02	Diagnosis	ICD-9-CM	Coronary atherosclerosis of autologous vein bypass graft
Cardiovascular and metabolic conditions	414.03	Diagnosis	ICD-9-CM	Coronary atherosclerosis of nonautologous biological bypass graft
Cardiovascular and metabolic conditions	414.04	Diagnosis	ICD-9-CM	Coronary atherosclerosis of artery bypass graft
Cardiovascular and metabolic conditions	414.05	Diagnosis	ICD-9-CM	Coronary atherosclerosis of unspecified type of bypass graft
Cardiovascular and metabolic conditions	414.06	Diagnosis	ICD-9-CM	Coronary atherosclerosis, of native coronary artery of transplanted heart
Cardiovascular and metabolic conditions	414.07	Diagnosis	ICD-9-CM	Coronary atherosclerosis, of bypass graft (artery) (vein) of transplanted heart
Cardiovascular and metabolic conditions	414.1	Diagnosis	ICD-9-CM	Aneurysm and dissection of heart
Cardiovascular and metabolic conditions	414.10	Diagnosis	ICD-9-CM	Aneurysm of heart
Cardiovascular and metabolic conditions	414.11	Diagnosis	ICD-9-CM	Aneurysm of coronary vessels
Cardiovascular and metabolic conditions	414.12	Diagnosis	ICD-9-CM	Dissection of coronary artery
Cardiovascular and metabolic conditions	414.19	Diagnosis	ICD-9-CM	Other aneurysm of heart
Cardiovascular and metabolic conditions	414.2	Diagnosis	ICD-9-CM	Chronic total occlusion of coronary artery
Cardiovascular and metabolic conditions	414.3	Diagnosis	ICD-9-CM	Coronary atherosclerosis due to lipid rich plaque
Cardiovascular and metabolic conditions	414.4	Diagnosis	ICD-9-CM	Coronary atherosclerosis due to calcified coronary lesion
Cardiovascular and metabolic conditions	414.8	Diagnosis	ICD-9-CM	Other specified forms of chronic ischemic heart disease
Cardiovascular and metabolic conditions	414.9	Diagnosis	ICD-9-CM	Unspecified chronic ischemic heart disease
Cardiovascular and metabolic conditions	429	Diagnosis	ICD-9-CM	Ill-defined descriptions and complications of heart disease
Cardiovascular and metabolic conditions	429.0	Diagnosis	ICD-9-CM	Unspecified myocarditis
Cardiovascular and metabolic conditions	429.1	Diagnosis	ICD-9-CM	Myocardial degeneration
Cardiovascular and metabolic conditions	429.2	Diagnosis	ICD-9-CM	Unspecified cardiovascular disease
Cardiovascular and metabolic conditions	429.3	Diagnosis	ICD-9-CM	Cardiomegaly
Cardiovascular and metabolic conditions	429.4	Diagnosis	ICD-9-CM	Functional disturbances following cardiac surgery
Cardiovascular and metabolic conditions	429.5	Diagnosis	ICD-9-CM	Rupture of chordae tendineae
Cardiovascular and metabolic conditions	429.6	Diagnosis	ICD-9-CM	Rupture of papillary muscle
Cardiovascular and metabolic conditions	429.7	Diagnosis	ICD-9-CM	Certain sequelae of myocardial infarction, not elsewhere classified
Cardiovascular and metabolic conditions	429.71	Diagnosis	ICD-9-CM	Acquired cardiac septal defect
Cardiovascular and metabolic conditions	429.79	Diagnosis	ICD-9-CM	Other certain sequelae of myocardial infarction, not elsewhere classified
Cardiovascular and metabolic conditions	429.8	Diagnosis	ICD-9-CM	Other ill-defined heart diseases
Cardiovascular and metabolic conditions	429.81	Diagnosis	ICD-9-CM	Other disorders of papillary muscle
Cardiovascular and metabolic conditions	429.82	Diagnosis	ICD-9-CM	Hyperkinetic heart disease
Cardiovascular and metabolic conditions	429.83	Diagnosis	ICD-9-CM	Takotsubo syndrome
Cardiovascular and metabolic conditions	429.89	Diagnosis	ICD-9-CM	Other ill-defined heart disease
Cardiovascular and metabolic conditions	429.9	Diagnosis	ICD-9-CM	Unspecified heart disease
Cardiovascular and metabolic conditions	440	Diagnosis	ICD-9-CM	Atherosclerosis
Cardiovascular and metabolic conditions	440.0	Diagnosis	ICD-9-CM	Atherosclerosis of aorta
Cardiovascular and metabolic conditions	440.1	Diagnosis	ICD-9-CM	Atherosclerosis of renal artery
Cardiovascular and metabolic conditions	440.2	Diagnosis	ICD-9-CM	Atherosclerosis of native arteries of the extremities
Cardiovascular and metabolic conditions	440.20	Diagnosis	ICD-9-CM	Atherosclerosis of native arteries of the extremities, unspecified
Cardiovascular and metabolic conditions	440.21	Diagnosis	ICD-9-CM	Atherosclerosis of native arteries of the extremities with intermittent claudication

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Cardiovascular and metabolic conditions	440.22	Diagnosis	ICD-9-CM	Atherosclerosis of native arteries of the extremities with rest pain
Cardiovascular and metabolic conditions	440.23	Diagnosis	ICD-9-CM	Atherosclerosis of native arteries of the extremities with ulceration
Cardiovascular and metabolic conditions	440.24	Diagnosis	ICD-9-CM	Atherosclerosis of native arteries of the extremities with gangrene
Cardiovascular and metabolic conditions	440.29	Diagnosis	ICD-9-CM	Other atherosclerosis of native arteries of the extremities
Cardiovascular and metabolic conditions	440.3	Diagnosis	ICD-9-CM	Atherosclerosis of bypass graft of extremities
Cardiovascular and metabolic conditions	440.30	Diagnosis	ICD-9-CM	Atherosclerosis of unspecified bypass graft of extremities
Cardiovascular and metabolic conditions	440.31	Diagnosis	ICD-9-CM	Atherosclerosis of autologous vein bypass graft of extremities
Cardiovascular and metabolic conditions	440.32	Diagnosis	ICD-9-CM	Atherosclerosis of nonautologous biological bypass graft of extremities
Cardiovascular and metabolic conditions	440.4	Diagnosis	ICD-9-CM	Chronic total occlusion of artery of the extremities
Cardiovascular and metabolic conditions	440.8	Diagnosis	ICD-9-CM	Atherosclerosis of other specified arteries
Cardiovascular and metabolic conditions	440.9	Diagnosis	ICD-9-CM	Generalized and unspecified atherosclerosis
Cardiovascular and metabolic conditions	997.91	Diagnosis	ICD-9-CM	Hypertension
Cerebral Palsy	333.71	Diagnosis	ICD-9-CM	Athetoid cerebral palsy
Cerebral Palsy	343	Diagnosis	ICD-9-CM	Infantile cerebral palsy
Cerebral Palsy	343.0	Diagnosis	ICD-9-CM	Diplegic infantile cerebral palsy
Cerebral Palsy	343.1	Diagnosis	ICD-9-CM	Hemiplegic infantile cerebral palsy
Cerebral Palsy	343.2	Diagnosis	ICD-9-CM	Quadriplegic infantile cerebral palsy
Cerebral Palsy	343.3	Diagnosis	ICD-9-CM	Monoplegic infantile cerebral palsy
Cerebral Palsy	343.8	Diagnosis	ICD-9-CM	Other specified infantile cerebral palsy
Cerebral Palsy	343.9	Diagnosis	ICD-9-CM	Unspecified infantile cerebral palsy
Cystic Fibrosis	277.0	Diagnosis	ICD-9-CM	Cystic fibrosis
Cystic Fibrosis	277.00	Diagnosis	ICD-9-CM	Cystic fibrosis without mention of meconium ileus
Cystic Fibrosis	277.01	Diagnosis	ICD-9-CM	Cystic fibrosis with meconium ileus
Cystic Fibrosis	277.02	Diagnosis	ICD-9-CM	Cystic fibrosis with pulmonary manifestations
Cystic Fibrosis	277.03	Diagnosis	ICD-9-CM	Cystic fibrosis with gastrointestinal manifestations
Cystic Fibrosis	277.09	Diagnosis	ICD-9-CM	Cystic fibrosis with other manifestations
Cystic Fibrosis	V83.81	Diagnosis	ICD-9-CM	Cystic fibrosis gene carrier
Gynecological conditions	218	Diagnosis	ICD-9-CM	Uterine leiomyoma
Gynecological conditions	218.0	Diagnosis	ICD-9-CM	Submucous leiomyoma of uterus
Gynecological conditions	218.1	Diagnosis	ICD-9-CM	Intramural leiomyoma of uterus
Gynecological conditions	218.2	Diagnosis	ICD-9-CM	Subserous leiomyoma of uterus
Gynecological conditions	218.9	Diagnosis	ICD-9-CM	Leiomyoma of uterus, unspecified
Gynecological conditions	256.4	Diagnosis	ICD-9-CM	Polycystic ovaries
Gynecological conditions	346	Diagnosis	ICD-9-CM	Migraine
Gynecological conditions	346.0	Diagnosis	ICD-9-CM	Migraine with aura
Gynecological conditions	346.00	Diagnosis	ICD-9-CM	Migraine with aura, without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.01	Diagnosis	ICD-9-CM	Migraine with aura, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.02	Diagnosis	ICD-9-CM	Migraine with aura, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.03	Diagnosis	ICD-9-CM	Migraine with aura, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.1	Diagnosis	ICD-9-CM	Migraine without aura
Gynecological conditions	346.10	Diagnosis	ICD-9-CM	Migraine without aura, without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.11	Diagnosis	ICD-9-CM	Migraine without aura, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.12	Diagnosis	ICD-9-CM	Migraine without aura, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.13	Diagnosis	ICD-9-CM	Migraine without aura, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.2	Diagnosis	ICD-9-CM	Variants of migraine, not elsewhere classified
Gynecological conditions	346.20	Diagnosis	ICD-9-CM	Variants of migraine, not elsewhere classified, without mention of intractable migraine without mention of status migrainosus

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Gynecological conditions	346.21	Diagnosis	ICD-9-CM	Variants of migraine, not elsewhere classified, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.22	Diagnosis	ICD-9-CM	Variants of migraine, not elsewhere classified, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.23	Diagnosis	ICD-9-CM	Variants of migraine, not elsewhere classified, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.3	Diagnosis	ICD-9-CM	Hemiplegic migraine
Gynecological conditions	346.30	Diagnosis	ICD-9-CM	Hemiplegic migraine, without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.31	Diagnosis	ICD-9-CM	Hemiplegic migraine, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.32	Diagnosis	ICD-9-CM	Hemiplegic migraine, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.33	Diagnosis	ICD-9-CM	Hemiplegic migraine, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.4	Diagnosis	ICD-9-CM	Menstrual migraine
Gynecological conditions	346.40	Diagnosis	ICD-9-CM	Menstrual migraine, without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.41	Diagnosis	ICD-9-CM	Menstrual migraine, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.42	Diagnosis	ICD-9-CM	Menstrual migraine, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.43	Diagnosis	ICD-9-CM	Menstrual migraine, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.5	Diagnosis	ICD-9-CM	Persistent migraine aura without cerebral infarction
Gynecological conditions	346.50	Diagnosis	ICD-9-CM	Persistent migraine aura without cerebral infarction, without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.51	Diagnosis	ICD-9-CM	Persistent migraine aura without cerebral infarction, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.52	Diagnosis	ICD-9-CM	Persistent migraine aura without cerebral infarction, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.53	Diagnosis	ICD-9-CM	Persistent migraine aura without cerebral infarction, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.6	Diagnosis	ICD-9-CM	Persistent migraine aura with cerebral infarction
Gynecological conditions	346.60	Diagnosis	ICD-9-CM	Persistent migraine aura with cerebral infarction, without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.61	Diagnosis	ICD-9-CM	Persistent migraine aura with cerebral infarction, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.62	Diagnosis	ICD-9-CM	Persistent migraine aura with cerebral infarction, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.63	Diagnosis	ICD-9-CM	Persistent migraine aura with cerebral infarction, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.7	Diagnosis	ICD-9-CM	Chronic migraine without aura
Gynecological conditions	346.70	Diagnosis	ICD-9-CM	Chronic migraine without aura, without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.71	Diagnosis	ICD-9-CM	Chronic migraine without aura, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.72	Diagnosis	ICD-9-CM	Chronic migraine without aura, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.73	Diagnosis	ICD-9-CM	Chronic migraine without aura, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.8	Diagnosis	ICD-9-CM	Other forms of migraine
Gynecological conditions	346.80	Diagnosis	ICD-9-CM	Other forms of migraine, without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.81	Diagnosis	ICD-9-CM	Other forms of migraine, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.82	Diagnosis	ICD-9-CM	Other forms of migraine, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.83	Diagnosis	ICD-9-CM	Other forms of migraine, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	346.9	Diagnosis	ICD-9-CM	Migraine, unspecified
Gynecological conditions	346.90	Diagnosis	ICD-9-CM	Migraine, unspecified without mention of intractable migraine without mention of status migrainosus
Gynecological conditions	346.91	Diagnosis	ICD-9-CM	Migraine, unspecified, with intractable migraine, so stated, without mention of status migrainosus
Gynecological conditions	346.92	Diagnosis	ICD-9-CM	Migraine, unspecified, without mention of intractable migraine with status migrainosus
Gynecological conditions	346.93	Diagnosis	ICD-9-CM	Migraine, unspecified, with intractable migraine, so stated, with status migrainosus
Gynecological conditions	614	Diagnosis	ICD-9-CM	Inflammatory disease of ovary, fallopian tube, pelvic cellular tissue, and peritoneum
Gynecological conditions	614.0	Diagnosis	ICD-9-CM	Acute salpingitis and oophoritis
Gynecological conditions	614.1	Diagnosis	ICD-9-CM	Chronic salpingitis and oophoritis
Gynecological conditions	614.2	Diagnosis	ICD-9-CM	Salpingitis and oophoritis not specified as acute, subacute, or chronic

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Gynecological conditions	614.3	Diagnosis	ICD-9-CM	Acute parametritis and pelvic cellulitis
Gynecological conditions	614.4	Diagnosis	ICD-9-CM	Chronic or unspecified parametritis and pelvic cellulitis
Gynecological conditions	614.5	Diagnosis	ICD-9-CM	Acute or unspecified pelvic peritonitis, female
Gynecological conditions	614.6	Diagnosis	ICD-9-CM	Pelvic peritoneal adhesions, female (postoperative) (postinfection)
Gynecological conditions	614.7	Diagnosis	ICD-9-CM	Other chronic pelvic peritonitis, female
Gynecological conditions	614.8	Diagnosis	ICD-9-CM	Other specified inflammatory disease of female pelvic organs and tissues
Gynecological conditions	614.9	Diagnosis	ICD-9-CM	Unspecified inflammatory disease of female pelvic organs and tissues
Gynecological conditions	615	Diagnosis	ICD-9-CM	Inflammatory diseases of uterus, except cervix
Gynecological conditions	615.0	Diagnosis	ICD-9-CM	Acute inflammatory disease of uterus, except cervix
Gynecological conditions	615.1	Diagnosis	ICD-9-CM	Chronic inflammatory disease of uterus, except cervix
Gynecological conditions	615.9	Diagnosis	ICD-9-CM	Unspecified inflammatory disease of uterus
Gynecological conditions	616	Diagnosis	ICD-9-CM	Inflammatory disease of cervix, vagina, and vulva
Gynecological conditions	616.0	Diagnosis	ICD-9-CM	Cervicitis and endocervicitis
Gynecological conditions	616.1	Diagnosis	ICD-9-CM	Vaginitis and vulvovaginitis
Gynecological conditions	616.10	Diagnosis	ICD-9-CM	Unspecified vaginitis and vulvovaginitis
Gynecological conditions	616.11	Diagnosis	ICD-9-CM	Vaginitis and vulvovaginitis in diseases classified elsewhere
Gynecological conditions	616.2	Diagnosis	ICD-9-CM	Cyst of Bartholin's gland
Gynecological conditions	616.3	Diagnosis	ICD-9-CM	Abscess of Bartholin's gland
Gynecological conditions	616.4	Diagnosis	ICD-9-CM	Other abscess of vulva
Gynecological conditions	616.5	Diagnosis	ICD-9-CM	Ulceration of vulva
Gynecological conditions	616.50	Diagnosis	ICD-9-CM	Unspecified ulceration of vulva
Gynecological conditions	616.51	Diagnosis	ICD-9-CM	Ulceration of vulva in disease classified elsewhere
Gynecological conditions	616.8	Diagnosis	ICD-9-CM	Other specified inflammatory diseases of cervix, vagina, and vulva
Gynecological conditions	616.81	Diagnosis	ICD-9-CM	Mucositis (ulcerative) of cervix, vagina, and vulva
Gynecological conditions	616.89	Diagnosis	ICD-9-CM	Other inflammatory disease of cervix, vagina and vulva
Gynecological conditions	616.9	Diagnosis	ICD-9-CM	Unspecified inflammatory disease of cervix, vagina, and vulva
Gynecological conditions	617	Diagnosis	ICD-9-CM	Endometriosis
Gynecological conditions	617.0	Diagnosis	ICD-9-CM	Endometriosis of uterus
Gynecological conditions	617.1	Diagnosis	ICD-9-CM	Endometriosis of ovary
Gynecological conditions	617.2	Diagnosis	ICD-9-CM	Endometriosis of fallopian tube
Gynecological conditions	617.3	Diagnosis	ICD-9-CM	Endometriosis of pelvic peritoneum
Gynecological conditions	617.4	Diagnosis	ICD-9-CM	Endometriosis of rectovaginal septum and vagina
Gynecological conditions	617.5	Diagnosis	ICD-9-CM	Endometriosis of intestine
Gynecological conditions	617.6	Diagnosis	ICD-9-CM	Endometriosis in scar of skin
Gynecological conditions	617.8	Diagnosis	ICD-9-CM	Endometriosis of other specified sites
Gynecological conditions	617.9	Diagnosis	ICD-9-CM	Endometriosis, site unspecified
Gynecological conditions	618	Diagnosis	ICD-9-CM	Genital prolapse
Gynecological conditions	618.0	Diagnosis	ICD-9-CM	Prolapse of vaginal walls without mention of uterine prolapse
Gynecological conditions	618.00	Diagnosis	ICD-9-CM	Unspecified prolapse of vaginal walls without mention of uterine prolapse
Gynecological conditions	618.01	Diagnosis	ICD-9-CM	Cystocele without mention of uterine prolapse, midline
Gynecological conditions	618.02	Diagnosis	ICD-9-CM	Cystocele without mention of uterine prolapse, lateral
Gynecological conditions	618.03	Diagnosis	ICD-9-CM	Urethrocele without mention of uterine prolapse
Gynecological conditions	618.04	Diagnosis	ICD-9-CM	Rectocele without mention of uterine prolapse
Gynecological conditions	618.05	Diagnosis	ICD-9-CM	Perineocele without mention of uterine prolapse
Gynecological conditions	618.09	Diagnosis	ICD-9-CM	Other prolapse of vaginal walls without mention of uterine prolapse
Gynecological conditions	618.1	Diagnosis	ICD-9-CM	Uterine prolapse without mention of vaginal wall prolapse
Gynecological conditions	618.2	Diagnosis	ICD-9-CM	Uterovaginal prolapse, incomplete
Gynecological conditions	618.3	Diagnosis	ICD-9-CM	Uterovaginal prolapse, complete

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Covariate	Code	Code Category	Code Type	Description
Gynecological conditions	618.4	Diagnosis	ICD-9-CM	Uterovaginal prolapse, unspecified
Gynecological conditions	618.5	Diagnosis	ICD-9-CM	Prolapse of vaginal vault after hysterectomy
Gynecological conditions	618.6	Diagnosis	ICD-9-CM	Vaginal enterocele, congenital or acquired
Gynecological conditions	618.7	Diagnosis	ICD-9-CM	Genital prolapse, old laceration of muscles of pelvic floor
Gynecological conditions	618.8	Diagnosis	ICD-9-CM	Other specified genital prolapse
Gynecological conditions	618.81	Diagnosis	ICD-9-CM	Incompetence or weakening of pubocervical tissue
Gynecological conditions	618.82	Diagnosis	ICD-9-CM	Incompetence or weakening of rectovaginal tissue
Gynecological conditions	618.83	Diagnosis	ICD-9-CM	Pelvic muscle wasting
Gynecological conditions	618.84	Diagnosis	ICD-9-CM	Cervical stump prolapse
Gynecological conditions	618.89	Diagnosis	ICD-9-CM	Other specified genital prolapse
Gynecological conditions	618.9	Diagnosis	ICD-9-CM	Unspecified genital prolapse
Gynecological conditions	619	Diagnosis	ICD-9-CM	Fistula involving female genital tract
Gynecological conditions	619.0	Diagnosis	ICD-9-CM	Urinary-genital tract fistula, female
Gynecological conditions	619.1	Diagnosis	ICD-9-CM	Digestive-genital tract fistula, female
Gynecological conditions	619.2	Diagnosis	ICD-9-CM	Genital tract-skin fistula, female
Gynecological conditions	619.8	Diagnosis	ICD-9-CM	Other specified fistula involving female genital tract
Gynecological conditions	619.9	Diagnosis	ICD-9-CM	Unspecified fistula involving female genital tract
Gynecological conditions	620	Diagnosis	ICD-9-CM	Noninflammatory disorders of ovary, fallopian tube, and broad ligament
Gynecological conditions	620.0	Diagnosis	ICD-9-CM	Follicular cyst of ovary
Gynecological conditions	620.1	Diagnosis	ICD-9-CM	Corpus luteum cyst or hematoma
Gynecological conditions	620.2	Diagnosis	ICD-9-CM	Other and unspecified ovarian cyst
Gynecological conditions	620.3	Diagnosis	ICD-9-CM	Acquired atrophy of ovary and fallopian tube
Gynecological conditions	620.4	Diagnosis	ICD-9-CM	Prolapse or hernia of ovary and fallopian tube
Gynecological conditions	620.5	Diagnosis	ICD-9-CM	Torsion of ovary, ovarian pedicle, or fallopian tube
Gynecological conditions	620.6	Diagnosis	ICD-9-CM	Broad ligament laceration syndrome
Gynecological conditions	620.7	Diagnosis	ICD-9-CM	Hematoma of broad ligament
Gynecological conditions	620.8	Diagnosis	ICD-9-CM	Other noninflammatory disorder of ovary, fallopian tube, and broad ligament
Gynecological conditions	620.9	Diagnosis	ICD-9-CM	Unspecified noninflammatory disorder of ovary, fallopian tube, and broad ligament
Gynecological conditions	621	Diagnosis	ICD-9-CM	Disorders of uterus, not elsewhere classified
Gynecological conditions	621.0	Diagnosis	ICD-9-CM	Polyp of corpus uteri
Gynecological conditions	621.1	Diagnosis	ICD-9-CM	Chronic subinvolution of uterus
Gynecological conditions	621.2	Diagnosis	ICD-9-CM	Hypertrophy of uterus
Gynecological conditions	621.3	Diagnosis	ICD-9-CM	Endometrial hyperplasia
Gynecological conditions	621.30	Diagnosis	ICD-9-CM	Endometrial hyperplasia, unspecified
Gynecological conditions	621.31	Diagnosis	ICD-9-CM	Simple endometrial hyperplasia without atypia
Gynecological conditions	621.32	Diagnosis	ICD-9-CM	Complex endometrial hyperplasia without atypia
Gynecological conditions	621.33	Diagnosis	ICD-9-CM	Endometrial hyperplasia with atypia
Gynecological conditions	621.34	Diagnosis	ICD-9-CM	Benign endometrial hyperplasia
Gynecological conditions	621.35	Diagnosis	ICD-9-CM	Endometrial intraepithelial neoplasia [EIN]
Gynecological conditions	621.4	Diagnosis	ICD-9-CM	Hematometra
Gynecological conditions	621.5	Diagnosis	ICD-9-CM	Intrauterine synechiae
Gynecological conditions	621.6	Diagnosis	ICD-9-CM	Malposition of uterus
Gynecological conditions	621.7	Diagnosis	ICD-9-CM	Chronic inversion of uterus
Gynecological conditions	621.8	Diagnosis	ICD-9-CM	Other specified disorders of uterus, not elsewhere classified
Gynecological conditions	621.9	Diagnosis	ICD-9-CM	Unspecified disorder of uterus
Gynecological conditions	622	Diagnosis	ICD-9-CM	Noninflammatory disorders of cervix
Gynecological conditions	622.0	Diagnosis	ICD-9-CM	Erosion and ectropion of cervix
Gynecological conditions	622.1	Diagnosis	ICD-9-CM	Dysplasia of cervix (uteri)

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Covariate	Code	Code Category	Code Type	Description
Gynecological conditions	622.10	Diagnosis	ICD-9-CM	Dysplasia of cervix, unspecified
Gynecological conditions	622.11	Diagnosis	ICD-9-CM	Mild dysplasia of cervix
Gynecological conditions	622.12	Diagnosis	ICD-9-CM	Moderate dysplasia of cervix
Gynecological conditions	622.2	Diagnosis	ICD-9-CM	Leukoplakia of cervix (uteri)
Gynecological conditions	622.3	Diagnosis	ICD-9-CM	Old laceration of cervix
Gynecological conditions	622.4	Diagnosis	ICD-9-CM	Stricture and stenosis of cervix
Gynecological conditions	622.5	Diagnosis	ICD-9-CM	Incompetence of cervix
Gynecological conditions	622.6	Diagnosis	ICD-9-CM	Hypertrophic elongation of cervix
Gynecological conditions	622.7	Diagnosis	ICD-9-CM	Mucous polyp of cervix
Gynecological conditions	622.8	Diagnosis	ICD-9-CM	Other specified noninflammatory disorder of cervix
Gynecological conditions	622.9	Diagnosis	ICD-9-CM	Unspecified noninflammatory disorder of cervix
Gynecological conditions	623	Diagnosis	ICD-9-CM	Noninflammatory disorders of vagina
Gynecological conditions	623.0	Diagnosis	ICD-9-CM	Dysplasia of vagina
Gynecological conditions	623.1	Diagnosis	ICD-9-CM	Leukoplakia of vagina
Gynecological conditions	623.2	Diagnosis	ICD-9-CM	Stricture or atresia of vagina
Gynecological conditions	623.3	Diagnosis	ICD-9-CM	Tight hymenal ring
Gynecological conditions	623.4	Diagnosis	ICD-9-CM	Old vaginal laceration
Gynecological conditions	623.5	Diagnosis	ICD-9-CM	Leukorrhea, not specified as infective
Gynecological conditions	623.6	Diagnosis	ICD-9-CM	Vaginal hematoma
Gynecological conditions	623.7	Diagnosis	ICD-9-CM	Polyp of vagina
Gynecological conditions	623.8	Diagnosis	ICD-9-CM	Other specified noninflammatory disorder of vagina
Gynecological conditions	623.9	Diagnosis	ICD-9-CM	Unspecified noninflammatory disorder of vagina
Gynecological conditions	624	Diagnosis	ICD-9-CM	Noninflammatory disorders of vulva and perineum
Gynecological conditions	624.0	Diagnosis	ICD-9-CM	Dystrophy of vulva
Gynecological conditions	624.01	Diagnosis	ICD-9-CM	Vulvar intraepithelial neoplasia I [VIN I]
Gynecological conditions	624.02	Diagnosis	ICD-9-CM	Vulvar intraepithelial neoplasia II [VIN II]
Gynecological conditions	624.09	Diagnosis	ICD-9-CM	Other dystrophy of vulva
Gynecological conditions	624.1	Diagnosis	ICD-9-CM	Atrophy of vulva
Gynecological conditions	624.2	Diagnosis	ICD-9-CM	Hypertrophy of clitoris
Gynecological conditions	624.3	Diagnosis	ICD-9-CM	Hypertrophy of labia
Gynecological conditions	624.4	Diagnosis	ICD-9-CM	Old laceration or scarring of vulva
Gynecological conditions	624.5	Diagnosis	ICD-9-CM	Hematoma of vulva
Gynecological conditions	624.6	Diagnosis	ICD-9-CM	Polyp of labia and vulva
Gynecological conditions	624.8	Diagnosis	ICD-9-CM	Other specified noninflammatory disorder of vulva and perineum
Gynecological conditions	624.9	Diagnosis	ICD-9-CM	Unspecified noninflammatory disorder of vulva and perineum
Gynecological conditions	625	Diagnosis	ICD-9-CM	Pain and other symptoms associated with female genital organs
Gynecological conditions	625.0	Diagnosis	ICD-9-CM	Dyspareunia
Gynecological conditions	625.1	Diagnosis	ICD-9-CM	Vaginismus
Gynecological conditions	625.2	Diagnosis	ICD-9-CM	Mittelschmerz
Gynecological conditions	625.3	Diagnosis	ICD-9-CM	Dysmenorrhea
Gynecological conditions	625.4	Diagnosis	ICD-9-CM	Premenstrual tension syndromes
Gynecological conditions	625.5	Diagnosis	ICD-9-CM	Pelvic congestion syndrome
Gynecological conditions	625.6	Diagnosis	ICD-9-CM	Female stress incontinence
Gynecological conditions	625.7	Diagnosis	ICD-9-CM	Vulvodynia
Gynecological conditions	625.70	Diagnosis	ICD-9-CM	Vulvodynia, unspecified
Gynecological conditions	625.71	Diagnosis	ICD-9-CM	Vulvar vestibulitis
Gynecological conditions	625.79	Diagnosis	ICD-9-CM	Other vulvodynia
Gynecological conditions	625.8	Diagnosis	ICD-9-CM	Other specified symptom associated with female genital organs

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Gynecological conditions	625.9	Diagnosis	ICD-9-CM	Unspecified symptom associated with female genital organs
Gynecological conditions	626	Diagnosis	ICD-9-CM	Disorders of menstruation and other abnormal bleeding from female genital tract
Gynecological conditions	626.0	Diagnosis	ICD-9-CM	Absence of menstruation
Gynecological conditions	626.1	Diagnosis	ICD-9-CM	Scanty or infrequent menstruation
Gynecological conditions	626.2	Diagnosis	ICD-9-CM	Excessive or frequent menstruation
Gynecological conditions	626.3	Diagnosis	ICD-9-CM	Puberty bleeding
Gynecological conditions	626.4	Diagnosis	ICD-9-CM	Irregular menstrual cycle
Gynecological conditions	626.5	Diagnosis	ICD-9-CM	Ovulation bleeding
Gynecological conditions	626.6	Diagnosis	ICD-9-CM	Metrorrhagia
Gynecological conditions	626.7	Diagnosis	ICD-9-CM	Postcoital bleeding
Gynecological conditions	626.8	Diagnosis	ICD-9-CM	Other disorder of menstruation and other abnormal bleeding from female genital tract
Gynecological conditions	626.9	Diagnosis	ICD-9-CM	Unspecified disorder of menstruation and other abnormal bleeding from female genital tract
Gynecological conditions	627	Diagnosis	ICD-9-CM	Menopausal and postmenopausal disorders
Gynecological conditions	627.0	Diagnosis	ICD-9-CM	Premenopausal menorrhagia
Gynecological conditions	627.1	Diagnosis	ICD-9-CM	Postmenopausal bleeding
Gynecological conditions	627.2	Diagnosis	ICD-9-CM	Symptomatic menopausal or female climacteric states
Gynecological conditions	627.3	Diagnosis	ICD-9-CM	Postmenopausal atrophic vaginitis
Gynecological conditions	627.4	Diagnosis	ICD-9-CM	Symptomatic states associated with artificial menopause
Gynecological conditions	627.8	Diagnosis	ICD-9-CM	Other specified menopausal and postmenopausal disorder
Gynecological conditions	627.9	Diagnosis	ICD-9-CM	Unspecified menopausal and postmenopausal disorder
Gynecological conditions	628	Diagnosis	ICD-9-CM	Female infertility
Gynecological conditions	628.0	Diagnosis	ICD-9-CM	Female infertility associated with anovulation
Gynecological conditions	628.1	Diagnosis	ICD-9-CM	Female infertility of pituitary-hypothalamic origin
Gynecological conditions	628.2	Diagnosis	ICD-9-CM	Female infertility of tubal origin
Gynecological conditions	628.3	Diagnosis	ICD-9-CM	Female infertility of uterine origin
Gynecological conditions	628.4	Diagnosis	ICD-9-CM	Female infertility of cervical or vaginal origin
Gynecological conditions	628.8	Diagnosis	ICD-9-CM	Female infertility of other specified origin
Gynecological conditions	628.9	Diagnosis	ICD-9-CM	Female infertility of unspecified origin
Gynecological conditions	629	Diagnosis	ICD-9-CM	Other disorders of female genital organs
Gynecological conditions	629.0	Diagnosis	ICD-9-CM	Hematocele, female, not elsewhere classified
Gynecological conditions	629.1	Diagnosis	ICD-9-CM	Hydrocele, canal of Nuck
Gynecological conditions	629.2	Diagnosis	ICD-9-CM	Female genital mutilation status
Gynecological conditions	629.20	Diagnosis	ICD-9-CM	Female genital mutilation status, unspecified
Gynecological conditions	629.21	Diagnosis	ICD-9-CM	Female genital mutilation, Type I status
Gynecological conditions	629.22	Diagnosis	ICD-9-CM	Female genital mutilation, Type II status
Gynecological conditions	629.23	Diagnosis	ICD-9-CM	Female genital mutilation, Type III status
Gynecological conditions	629.29	Diagnosis	ICD-9-CM	Other female genital mutilation status
Gynecological conditions	629.3	Diagnosis	ICD-9-CM	Complication of implanted vaginal mesh and other prosthetic materials
Gynecological conditions	629.31	Diagnosis	ICD-9-CM	Erosion of implanted vaginal mesh and other prosthetic materials to surrounding organ or tissue
Gynecological conditions	629.32	Diagnosis	ICD-9-CM	Exposure of implanted vaginal mesh and other prosthetic materials into vagina
Gynecological conditions	629.8	Diagnosis	ICD-9-CM	Other specified disorders of female genital organs
Gynecological conditions	629.81	Diagnosis	ICD-9-CM	Recurrent pregnancy loss without current pregnancy
Gynecological conditions	629.89	Diagnosis	ICD-9-CM	Other specified disorders of female genital organs
Gynecological conditions	629.9	Diagnosis	ICD-9-CM	Unspecified disorder of female genital organs
Gynecological conditions	704.1	Diagnosis	ICD-9-CM	Hirsutism
Gynecological conditions	706.0	Diagnosis	ICD-9-CM	Acne varioliformis
Gynecological conditions	706.1	Diagnosis	ICD-9-CM	Other acne
Hypercoagulable states and coagulation defects	270.4	Diagnosis	ICD-9-CM	Disturbances of sulphur-bearing amino-acid metabolism

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Hypercoagulable states and coagulation defects	286.3	Diagnosis	ICD-9-CM	Congenital deficiency of other clotting factors
Hypercoagulable states and coagulation defects	286.6	Diagnosis	ICD-9-CM	Defibrination syndrome
Hypercoagulable states and coagulation defects	289.81	Diagnosis	ICD-9-CM	Primary hypercoagulable state
Hypercoagulable states and coagulation defects	289.82	Diagnosis	ICD-9-CM	Secondary hypercoagulable state
Immobility conditions	29000	Procedure	CPT-4	Application of halo type body cast (see 20661-20663 for insertion)
Immobility conditions	29305	Procedure	CPT-4	Application of hip spica cast; 1 leg
Immobility conditions	29325	Procedure	CPT-4	Application of hip spica cast; 1 and one-half spica or both legs
Immobility conditions	29345	Procedure	CPT-4	Application of long leg cast (thigh to toes);
Immobility conditions	29365	Procedure	CPT-4	Application of cylinder cast (thigh to ankle)
Immobility conditions	342	Diagnosis	ICD-9-CM	Hemiplegia and hemiparesis
Immobility conditions	342.0	Diagnosis	ICD-9-CM	Flaccid hemiplegia
Immobility conditions	342.1	Diagnosis	ICD-9-CM	Spastic hemiplegia
Immobility conditions	342.8	Diagnosis	ICD-9-CM	Other specified hemiplegia
Immobility conditions	342.9	Diagnosis	ICD-9-CM	Unspecified hemiplegia
Immobility conditions	343.4	Diagnosis	ICD-9-CM	Infantile hemiplegia
Immobility conditions	344	Diagnosis	ICD-9-CM	Other paralytic syndromes
Immobility conditions	344.0	Diagnosis	ICD-9-CM	Quadriplegia and quadriplegia
Immobility conditions	344.1	Diagnosis	ICD-9-CM	Paraplegia
Immobility conditions	344.2	Diagnosis	ICD-9-CM	Diplegia of upper limbs
Immobility conditions	344.3	Diagnosis	ICD-9-CM	Monoplegia of lower limb
Immobility conditions	344.4	Diagnosis	ICD-9-CM	Monoplegia of upper limb
Immobility conditions	344.5	Diagnosis	ICD-9-CM	Unspecified monoplegia
Immobility conditions	344.6	Diagnosis	ICD-9-CM	Cauda equina syndrome
Immobility conditions	344.8	Diagnosis	ICD-9-CM	Other specified paralytic syndromes
Immobility conditions	344.9	Diagnosis	ICD-9-CM	Unspecified paralysis
Immobility conditions	741	Diagnosis	ICD-9-CM	Spina bifida
Immobility conditions	741.0	Diagnosis	ICD-9-CM	Spina bifida with hydrocephalus
Immobility conditions	741.9	Diagnosis	ICD-9-CM	Spina bifida without mention of hydrocephalus
Immobility conditions	800	Diagnosis	ICD-9-CM	Fracture of vault of skull
Immobility conditions	800.0	Diagnosis	ICD-9-CM	Closed fracture of vault of skull without mention of intracranial injury
Immobility conditions	800.1	Diagnosis	ICD-9-CM	Closed fracture of vault of skull with cerebral laceration and contusion
Immobility conditions	800.2	Diagnosis	ICD-9-CM	Closed fracture of vault of skull with subarachnoid, subdural, and extradural hemorrhage
Immobility conditions	800.3	Diagnosis	ICD-9-CM	Closed fracture of vault of skull with other and unspecified intracranial hemorrhage
Immobility conditions	800.4	Diagnosis	ICD-9-CM	Closed fracture of vault of skull with intercranial injury of other and unspecified nature
Immobility conditions	800.5	Diagnosis	ICD-9-CM	Open fracture of vault of skull without mention of intracranial injury
Immobility conditions	800.6	Diagnosis	ICD-9-CM	Open fracture of vault of skull with cerebral laceration and contusion
Immobility conditions	800.7	Diagnosis	ICD-9-CM	Open fracture of vault of skull with subarachnoid, subdural, and extradural hemorrhage
Immobility conditions	800.8	Diagnosis	ICD-9-CM	Open fracture of vault of skull with other and unspecified intracranial hemorrhage
Immobility conditions	800.9	Diagnosis	ICD-9-CM	Open fracture of vault of skull with intracranial injury of other and unspecified nature
Immobility conditions	801	Diagnosis	ICD-9-CM	Fracture of base of skull
Immobility conditions	801.0	Diagnosis	ICD-9-CM	Closed fracture of base of skull without mention of intracranial injury
Immobility conditions	801.1	Diagnosis	ICD-9-CM	Closed fracture of base of skull with cerebral laceration and contusion
Immobility conditions	801.2	Diagnosis	ICD-9-CM	Closed fracture of base of skull with subarachnoid, subdural, and extradural hemorrhage
Immobility conditions	801.3	Diagnosis	ICD-9-CM	Closed fracture of base of skull with other and unspecified intracranial hemorrhage
Immobility conditions	801.4	Diagnosis	ICD-9-CM	Closed fracture of base of skull with intracranial injury of other and unspecified nature
Immobility conditions	801.5	Diagnosis	ICD-9-CM	Open fracture of base of skull without mention of intracranial injury
Immobility conditions	801.6	Diagnosis	ICD-9-CM	Open fracture of base of skull with cerebral laceration and contusion
Immobility conditions	801.7	Diagnosis	ICD-9-CM	Open fracture of base of skull with subarachnoid, subdural, and extradural hemorrhage

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Immobility conditions	801.8	Diagnosis	ICD-9-CM	Open fracture of base of skull with other and unspecified intracranial hemorrhage
Immobility conditions	801.9	Diagnosis	ICD-9-CM	Open fracture of base of skull with intracranial injury of other and unspecified nature
Immobility conditions	802	Diagnosis	ICD-9-CM	Fracture of face bones
Immobility conditions	802.0	Diagnosis	ICD-9-CM	Nasal bones, closed fracture
Immobility conditions	802.1	Diagnosis	ICD-9-CM	Nasal bones, open fracture
Immobility conditions	802.2	Diagnosis	ICD-9-CM	Mandible, closed fracture
Immobility conditions	802.3	Diagnosis	ICD-9-CM	Mandible, open fracture
Immobility conditions	802.4	Diagnosis	ICD-9-CM	Malar and maxillary bones, closed fracture
Immobility conditions	802.5	Diagnosis	ICD-9-CM	Malar and maxillary bones, open fracture
Immobility conditions	802.6	Diagnosis	ICD-9-CM	Orbital floor (blow-out), closed fracture
Immobility conditions	802.7	Diagnosis	ICD-9-CM	Orbital floor (blow-out), open fracture
Immobility conditions	802.8	Diagnosis	ICD-9-CM	Other facial bones, closed fracture
Immobility conditions	802.9	Diagnosis	ICD-9-CM	Other facial bones, open fracture
Immobility conditions	803	Diagnosis	ICD-9-CM	Other and unqualified skull fractures
Immobility conditions	803.0	Diagnosis	ICD-9-CM	Other closed skull fracture without mention of intracranial injury
Immobility conditions	803.1	Diagnosis	ICD-9-CM	Other closed skull fracture with cerebral laceration and contusion
Immobility conditions	803.2	Diagnosis	ICD-9-CM	Other closed skull fracture with subarachnoid, subdural, and extradural hemorrhage
Immobility conditions	803.3	Diagnosis	ICD-9-CM	Closed skull fracture with other and unspecified intracranial hemorrhage
Immobility conditions	803.4	Diagnosis	ICD-9-CM	Other closed skull fracture with intracranial injury of other and unspecified nature
Immobility conditions	803.5	Diagnosis	ICD-9-CM	Other open skull fracture without mention of intracranial injury
Immobility conditions	803.6	Diagnosis	ICD-9-CM	Other open skull fracture with cerebral laceration and contusion
Immobility conditions	803.7	Diagnosis	ICD-9-CM	Other open skull fracture with subarachnoid, subdural, and extradural hemorrhage
Immobility conditions	803.8	Diagnosis	ICD-9-CM	Other open skull fracture with other and unspecified intracranial hemorrhage
Immobility conditions	803.9	Diagnosis	ICD-9-CM	Other open skull fracture with intracranial injury of other and unspecified nature
Immobility conditions	804	Diagnosis	ICD-9-CM	Multiple fractures involving skull or face with other bones
Immobility conditions	804.0	Diagnosis	ICD-9-CM	Closed fractures involving skull or face with other bones, without mention of intracranial injury
Immobility conditions	804.1	Diagnosis	ICD-9-CM	Closed fractures involving skull or face with other bones, with cerebral laceration and contusion
Immobility conditions	804.2	Diagnosis	ICD-9-CM	Closed fractures involving skull or face with other bones with subarachnoid, subdural, and extradural hemorrhage
Immobility conditions	804.3	Diagnosis	ICD-9-CM	Closed fractures involving skull or face with other bones, with other and unspecified intracranial hemorrhage
Immobility conditions	804.4	Diagnosis	ICD-9-CM	Closed fractures involving skull or face with other bones, with intracranial injury of other and unspecified nature
Immobility conditions	804.5	Diagnosis	ICD-9-CM	Open fractures involving skull or face with other bones, without mention of intracranial injury
Immobility conditions	804.6	Diagnosis	ICD-9-CM	Open fractures involving skull or face with other bones, with cerebral laceration and contusion
Immobility conditions	804.7	Diagnosis	ICD-9-CM	Open fractures involving skull or face with other bones with subarachnoid, subdural, and extradural hemorrhage
Immobility conditions	804.8	Diagnosis	ICD-9-CM	Open fractures involving skull or face with other bones, with other and unspecified intracranial hemorrhage
Immobility conditions	804.9	Diagnosis	ICD-9-CM	Open fractures involving skull or face with other bones, with intracranial injury of other and unspecified nature
Immobility conditions	805	Diagnosis	ICD-9-CM	Fracture of vertebral column without mention of spinal cord injury
Immobility conditions	805.0	Diagnosis	ICD-9-CM	Closed fracture of cervical vertebra without mention of spinal cord injury
Immobility conditions	805.1	Diagnosis	ICD-9-CM	Open fracture of cervical vertebra without mention of spinal cord injury
Immobility conditions	805.2	Diagnosis	ICD-9-CM	Closed fracture of dorsal (thoracic) vertebra without mention of spinal cord injury
Immobility conditions	805.3	Diagnosis	ICD-9-CM	Open fracture of dorsal (thoracic) vertebra without mention of spinal cord injury
Immobility conditions	805.4	Diagnosis	ICD-9-CM	Closed fracture of lumbar vertebra without mention of spinal cord injury
Immobility conditions	805.5	Diagnosis	ICD-9-CM	Open fracture of lumbar vertebra without mention of spinal cord injury
Immobility conditions	805.6	Diagnosis	ICD-9-CM	Closed fracture of sacrum and coccyx without mention of spinal cord injury
Immobility conditions	805.7	Diagnosis	ICD-9-CM	Open fracture of sacrum and coccyx without mention of spinal cord injury
Immobility conditions	805.8	Diagnosis	ICD-9-CM	Closed fracture of unspecified part of vertebral column without mention of spinal cord injury
Immobility conditions	805.9	Diagnosis	ICD-9-CM	Open fracture of unspecified part of vertebral column without mention of spinal cord injury
Immobility conditions	806	Diagnosis	ICD-9-CM	Fracture of vertebral column with spinal cord injury
Immobility conditions	806.0	Diagnosis	ICD-9-CM	Closed fracture of cervical vertebra with spinal cord injury

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Immobility conditions	806.1	Diagnosis	ICD-9-CM	Open fracture of cervical vertebra with spinal cord injury
Immobility conditions	806.2	Diagnosis	ICD-9-CM	Closed fracture of dorsal (thoracic) vertebra with spinal cord injury
Immobility conditions	806.3	Diagnosis	ICD-9-CM	Open fracture of dorsal vertebra with spinal cord injury
Immobility conditions	806.4	Diagnosis	ICD-9-CM	Closed fracture of lumbar spine with spinal cord injury
Immobility conditions	806.5	Diagnosis	ICD-9-CM	Open fracture of lumbar spine with spinal cord injury
Immobility conditions	806.6	Diagnosis	ICD-9-CM	Closed fracture of sacrum and coccyx with spinal cord injury
Immobility conditions	806.7	Diagnosis	ICD-9-CM	Open fracture of sacrum and coccyx with spinal cord injury
Immobility conditions	806.8	Diagnosis	ICD-9-CM	Closed fracture of unspecified vertebra with spinal cord injury
Immobility conditions	806.9	Diagnosis	ICD-9-CM	Open fracture of unspecified vertebra with spinal cord injury
Immobility conditions	807	Diagnosis	ICD-9-CM	Fracture of rib(s), sternum, larynx, and trachea
Immobility conditions	807.0	Diagnosis	ICD-9-CM	Closed fracture of rib(s)
Immobility conditions	807.1	Diagnosis	ICD-9-CM	Open fracture of rib(s)
Immobility conditions	807.2	Diagnosis	ICD-9-CM	Closed fracture of sternum
Immobility conditions	807.3	Diagnosis	ICD-9-CM	Open fracture of sternum
Immobility conditions	807.4	Diagnosis	ICD-9-CM	Flail chest
Immobility conditions	807.5	Diagnosis	ICD-9-CM	Closed fracture of larynx and trachea
Immobility conditions	807.6	Diagnosis	ICD-9-CM	Open fracture of larynx and trachea
Immobility conditions	808	Diagnosis	ICD-9-CM	Fracture of pelvis
Immobility conditions	808.0	Diagnosis	ICD-9-CM	Closed fracture of acetabulum
Immobility conditions	808.1	Diagnosis	ICD-9-CM	Open fracture of acetabulum
Immobility conditions	808.2	Diagnosis	ICD-9-CM	Closed fracture of pubis
Immobility conditions	808.3	Diagnosis	ICD-9-CM	Open fracture of pubis
Immobility conditions	808.4	Diagnosis	ICD-9-CM	Closed fracture of other specified part of pelvis
Immobility conditions	808.5	Diagnosis	ICD-9-CM	Open fracture of other specified part of pelvis
Immobility conditions	808.8	Diagnosis	ICD-9-CM	Unspecified closed fracture of pelvis
Immobility conditions	808.9	Diagnosis	ICD-9-CM	Unspecified open fracture of pelvis
Immobility conditions	809	Diagnosis	ICD-9-CM	Ill-defined fractures of bones of trunk
Immobility conditions	809.0	Diagnosis	ICD-9-CM	Fracture of bones of trunk, closed
Immobility conditions	809.1	Diagnosis	ICD-9-CM	Fracture of bones of trunk, open
Immobility conditions	820	Diagnosis	ICD-9-CM	Fracture of neck of femur
Immobility conditions	820.0	Diagnosis	ICD-9-CM	Closed transcervical fracture
Immobility conditions	820.1	Diagnosis	ICD-9-CM	Open transcervical fracture
Immobility conditions	820.2	Diagnosis	ICD-9-CM	Closed pertrochanteric fracture of femur
Immobility conditions	820.3	Diagnosis	ICD-9-CM	Open pertrochanteric fracture of femur
Immobility conditions	820.8	Diagnosis	ICD-9-CM	Closed fracture of unspecified part of neck of femur
Immobility conditions	820.9	Diagnosis	ICD-9-CM	Open fracture of unspecified part of neck of femur
Immobility conditions	821	Diagnosis	ICD-9-CM	Fracture of other and unspecified parts of femur
Immobility conditions	821.0	Diagnosis	ICD-9-CM	Closed fracture of shaft or unspecified part of femur
Immobility conditions	821.1	Diagnosis	ICD-9-CM	Open fracture of shaft or unspecified part of femur
Immobility conditions	821.2	Diagnosis	ICD-9-CM	Closed fracture of lower end of femur
Immobility conditions	821.3	Diagnosis	ICD-9-CM	Open fracture of lower end of femur
Immobility conditions	822	Diagnosis	ICD-9-CM	Fracture of patella
Immobility conditions	822.0	Diagnosis	ICD-9-CM	Closed fracture of patella
Immobility conditions	822.1	Diagnosis	ICD-9-CM	Open fracture of patella
Immobility conditions	823	Diagnosis	ICD-9-CM	Fracture of tibia and fibula
Immobility conditions	823.0	Diagnosis	ICD-9-CM	Closed fracture of upper end of tibia and fibula
Immobility conditions	823.1	Diagnosis	ICD-9-CM	Open fracture of upper end of tibia and fibula
Immobility conditions	823.2	Diagnosis	ICD-9-CM	Closed fracture of shaft of tibia and fibula

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Immobility conditions	823.3	Diagnosis	ICD-9-CM	Open fracture of shaft of tibia and fibula
Immobility conditions	823.4	Diagnosis	ICD-9-CM	Torus fracture of tibia and fibula
Immobility conditions	823.8	Diagnosis	ICD-9-CM	Closed fracture of unspecified part of tibia and fibula
Immobility conditions	823.9	Diagnosis	ICD-9-CM	Open fracture of unspecified part of tibia and fibula
Immobility conditions	824	Diagnosis	ICD-9-CM	Fracture of ankle
Immobility conditions	824.0	Diagnosis	ICD-9-CM	Closed fracture of medial malleolus
Immobility conditions	824.1	Diagnosis	ICD-9-CM	Open fracture of medial malleolus
Immobility conditions	824.2	Diagnosis	ICD-9-CM	Closed fracture of lateral malleolus
Immobility conditions	824.3	Diagnosis	ICD-9-CM	Open fracture of lateral malleolus
Immobility conditions	824.4	Diagnosis	ICD-9-CM	Closed bimalleolar fracture
Immobility conditions	824.5	Diagnosis	ICD-9-CM	Open bimalleolar fracture
Immobility conditions	824.6	Diagnosis	ICD-9-CM	Closed trimalleolar fracture
Immobility conditions	824.7	Diagnosis	ICD-9-CM	Open trimalleolar fracture
Immobility conditions	824.8	Diagnosis	ICD-9-CM	Unspecified closed fracture of ankle
Immobility conditions	824.9	Diagnosis	ICD-9-CM	Unspecified open fracture of ankle
Immobility conditions	825	Diagnosis	ICD-9-CM	Fracture of one or more tarsal and metatarsal bones
Immobility conditions	825.0	Diagnosis	ICD-9-CM	Closed fracture of calcaneus
Immobility conditions	825.1	Diagnosis	ICD-9-CM	Open fracture of calcaneus
Immobility conditions	825.2	Diagnosis	ICD-9-CM	Closed fracture of other tarsal and metatarsal bones
Immobility conditions	825.3	Diagnosis	ICD-9-CM	Open fracture of other tarsal and metatarsal bones
Immobility conditions	826	Diagnosis	ICD-9-CM	Fracture of one or more phalanges of foot
Immobility conditions	826.0	Diagnosis	ICD-9-CM	Closed fracture of one or more phalanges of foot
Immobility conditions	826.1	Diagnosis	ICD-9-CM	Open fracture of one or more phalanges of foot
Immobility conditions	827	Diagnosis	ICD-9-CM	Other, multiple, and ill-defined fractures of lower limb
Immobility conditions	827.0	Diagnosis	ICD-9-CM	Other, multiple and ill-defined closed fractures of lower limb
Immobility conditions	827.1	Diagnosis	ICD-9-CM	Other, multiple and ill-defined open fractures of lower limb
Immobility conditions	828	Diagnosis	ICD-9-CM	Multiple fractures involving both lower limbs, lower with upper limb, and lower limb(s) with rib(s) and sternum
Immobility conditions	828.0	Diagnosis	ICD-9-CM	Multiple closed fractures involving both lower limbs, lower with upper limb, and lower limb(s) with rib(s) and sternum
Immobility conditions	828.1	Diagnosis	ICD-9-CM	Multiple fractures involving both lower limbs, lower with upper limb, and lower limb(s) with rib(s) and sternum, open
Immobility conditions	829	Diagnosis	ICD-9-CM	Fracture of unspecified bones
Immobility conditions	829.0	Diagnosis	ICD-9-CM	Closed fracture of unspecified bone
Immobility conditions	829.1	Diagnosis	ICD-9-CM	Open fracture of unspecified bone
Immobility conditions	851	Diagnosis	ICD-9-CM	Cerebral laceration and contusion
Immobility conditions	851.0	Diagnosis	ICD-9-CM	Cortex (cerebral) contusion without mention of open intracranial wound
Immobility conditions	851.1	Diagnosis	ICD-9-CM	Cortex (cerebral) contusion with open intracranial wound
Immobility conditions	851.2	Diagnosis	ICD-9-CM	Cortex (cerebral) laceration without mention of open intracranial wound
Immobility conditions	851.3	Diagnosis	ICD-9-CM	Cortex (cerebral) laceration with open intracranial wound
Immobility conditions	851.4	Diagnosis	ICD-9-CM	Cerebellar or brain stem contusion without mention of open intracranial wound
Immobility conditions	851.5	Diagnosis	ICD-9-CM	Cerebellar or brain stem contusion with open intracranial wound
Immobility conditions	851.6	Diagnosis	ICD-9-CM	Cerebellar or brain stem laceration without mention of open intracranial wound
Immobility conditions	851.7	Diagnosis	ICD-9-CM	Cerebellar or brain stem laceration with open intracranial wound
Immobility conditions	851.8	Diagnosis	ICD-9-CM	Other and unspecified cerebral laceration and contusion, without mention of open intracranial wound
Immobility conditions	851.9	Diagnosis	ICD-9-CM	Other and unspecified cerebral laceration and contusion, with open intracranial wound
Immobility conditions	852	Diagnosis	ICD-9-CM	Subarachnoid, subdural, and extradural hemorrhage, following injury
Immobility conditions	852.0	Diagnosis	ICD-9-CM	Subarachnoid hemorrhage following injury without mention of open intracranial wound
Immobility conditions	852.1	Diagnosis	ICD-9-CM	Subarachnoid hemorrhage following injury, with open intracranial wound

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Immobility conditions	852.2	Diagnosis	ICD-9-CM	Subdural hemorrhage following injury without mention of open intracranial wound
Immobility conditions	852.3	Diagnosis	ICD-9-CM	Subdural hemorrhage following injury, with open intracranial wound
Immobility conditions	852.4	Diagnosis	ICD-9-CM	Extradural hemorrhage following injury without mention of open intracranial wound
Immobility conditions	852.5	Diagnosis	ICD-9-CM	Extradural hemorrhage following injury with open intracranial wound
Immobility conditions	853	Diagnosis	ICD-9-CM	Other and unspecified intracranial hemorrhage following injury
Immobility conditions	853.0	Diagnosis	ICD-9-CM	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound
Immobility conditions	853.1	Diagnosis	ICD-9-CM	Other and unspecified intracranial hemorrhage following injury with open intracranial wound
Immobility conditions	854	Diagnosis	ICD-9-CM	Intracranial injury of other and unspecified nature
Immobility conditions	854.0	Diagnosis	ICD-9-CM	Intracranial injury of other and unspecified nature without mention of open intracranial wound
Immobility conditions	854.1	Diagnosis	ICD-9-CM	Intracranial injury of other and unspecified nature with open intracranial wound
Immobility conditions	861	Diagnosis	ICD-9-CM	Injury to heart and lung
Immobility conditions	861.0	Diagnosis	ICD-9-CM	Heart injury, without mention of open wound into thorax
Immobility conditions	861.1	Diagnosis	ICD-9-CM	Heart injury, with open wound into thorax
Immobility conditions	861.2	Diagnosis	ICD-9-CM	Lung injury, without mention of open wound into thorax
Immobility conditions	861.3	Diagnosis	ICD-9-CM	Lung injury, with open wound into thorax
Immobility conditions	862	Diagnosis	ICD-9-CM	Injury to other and unspecified intrathoracic organs
Immobility conditions	862.0	Diagnosis	ICD-9-CM	Diaphragm injury without mention of open wound into cavity
Immobility conditions	862.1	Diagnosis	ICD-9-CM	Diaphragm injury with open wound into cavity
Immobility conditions	862.2	Diagnosis	ICD-9-CM	Injury to other specified intrathoracic organs without mention of open wound into cavity
Immobility conditions	862.3	Diagnosis	ICD-9-CM	Injury to other specified intrathoracic organs with open wound into cavity
Immobility conditions	862.8	Diagnosis	ICD-9-CM	Injury to multiple and unspecified intrathoracic organs without mention of open wound into cavity
Immobility conditions	862.9	Diagnosis	ICD-9-CM	Injury to multiple and unspecified intrathoracic organs with open wound into cavity
Immobility conditions	863	Diagnosis	ICD-9-CM	Gastrointestinal tract injury
Immobility conditions	863.0	Diagnosis	ICD-9-CM	Stomach injury without mention of open wound into cavity
Immobility conditions	863.1	Diagnosis	ICD-9-CM	Stomach injury with open wound into cavity
Immobility conditions	863.2	Diagnosis	ICD-9-CM	Small intestine injury without mention of open wound into cavity
Immobility conditions	863.3	Diagnosis	ICD-9-CM	Small intestine injury with open wound into cavity
Immobility conditions	863.4	Diagnosis	ICD-9-CM	Colon or rectal injury without mention of open wound into cavity
Immobility conditions	863.5	Diagnosis	ICD-9-CM	Injury to colon or rectum with open wound into cavity
Immobility conditions	863.8	Diagnosis	ICD-9-CM	Injury to other and unspecified gastrointestinal sites without mention of open wound into cavity
Immobility conditions	863.9	Diagnosis	ICD-9-CM	Injury to other and unspecified gastrointestinal sites, with open wound into cavity
Immobility conditions	864	Diagnosis	ICD-9-CM	Injury to liver
Immobility conditions	864.0	Diagnosis	ICD-9-CM	Liver injury without mention of open wound into cavity
Immobility conditions	864.1	Diagnosis	ICD-9-CM	Liver injury with open wound into cavity
Immobility conditions	865	Diagnosis	ICD-9-CM	Injury to spleen
Immobility conditions	865.0	Diagnosis	ICD-9-CM	Spleen injury without mention of open wound into cavity
Immobility conditions	865.1	Diagnosis	ICD-9-CM	Spleen injury with open wound into cavity
Immobility conditions	866	Diagnosis	ICD-9-CM	Injury to kidney
Immobility conditions	866.0	Diagnosis	ICD-9-CM	Kidney injury without mention of open wound into cavity
Immobility conditions	866.1	Diagnosis	ICD-9-CM	Kidney injury with open wound into cavity
Immobility conditions	867	Diagnosis	ICD-9-CM	Injury to pelvic organs
Immobility conditions	867.0	Diagnosis	ICD-9-CM	Bladder and urethra injury without mention of open wound into cavity
Immobility conditions	867.1	Diagnosis	ICD-9-CM	Bladder and urethra injury with open wound into cavity
Immobility conditions	867.2	Diagnosis	ICD-9-CM	Ureter injury without mention of open wound into cavity
Immobility conditions	867.3	Diagnosis	ICD-9-CM	Ureter injury with open wound into cavity
Immobility conditions	867.4	Diagnosis	ICD-9-CM	Uterus injury without mention of open wound into cavity
Immobility conditions	867.5	Diagnosis	ICD-9-CM	Uterus injury with open wound into cavity
Immobility conditions	867.6	Diagnosis	ICD-9-CM	Injury to other specified pelvic organs without mention of open wound into cavity

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Immobility conditions	867.7	Diagnosis	ICD-9-CM	Injury to other specified pelvic organs with open wound into cavity
Immobility conditions	867.8	Diagnosis	ICD-9-CM	Injury to unspecified pelvic organ without mention of open wound into cavity
Immobility conditions	867.9	Diagnosis	ICD-9-CM	Injury to unspecified pelvic organ with open wound into cavity
Immobility conditions	868	Diagnosis	ICD-9-CM	Injury to other intra-abdominal organs
Immobility conditions	868.0	Diagnosis	ICD-9-CM	Injury to other intra-abdominal organs without mention of open wound into cavity
Immobility conditions	868.1	Diagnosis	ICD-9-CM	Injury to other intra-abdominal organs with open wound into cavity
Immobility conditions	869	Diagnosis	ICD-9-CM	Internal injury to unspecified or ill-defined organs
Immobility conditions	869.0	Diagnosis	ICD-9-CM	Internal injury to unspecified or ill-defined organs without mention of open wound into cavity
Immobility conditions	869.1	Diagnosis	ICD-9-CM	Internal injury to unspecified or ill-defined organs with open wound into cavity
Immobility conditions	925	Diagnosis	ICD-9-CM	Crushing injury of face, scalp, and neck
Immobility conditions	925.1	Diagnosis	ICD-9-CM	Crushing injury of face and scalp
Immobility conditions	925.2	Diagnosis	ICD-9-CM	Crushing injury of neck
Immobility conditions	926	Diagnosis	ICD-9-CM	Crushing injury of trunk
Immobility conditions	926.0	Diagnosis	ICD-9-CM	Crushing injury of external genitalia
Immobility conditions	926.1	Diagnosis	ICD-9-CM	Crushing injury of other specified sites of trunk
Immobility conditions	926.8	Diagnosis	ICD-9-CM	Crushing injury of multiple sites of trunk
Immobility conditions	926.9	Diagnosis	ICD-9-CM	Crushing injury of unspecified site of trunk
Immobility conditions	927	Diagnosis	ICD-9-CM	Crushing injury of upper limb
Immobility conditions	927.0	Diagnosis	ICD-9-CM	Crushing injury of shoulder and upper arm
Immobility conditions	927.1	Diagnosis	ICD-9-CM	Crushing injury of elbow and forearm
Immobility conditions	927.2	Diagnosis	ICD-9-CM	Crushing injury of wrist and hand(s), except finger(s) alone
Immobility conditions	927.3	Diagnosis	ICD-9-CM	Crushing injury of finger(s)
Immobility conditions	927.8	Diagnosis	ICD-9-CM	Crushing injury of multiple sites of upper limb
Immobility conditions	927.9	Diagnosis	ICD-9-CM	Crushing injury of unspecified site of upper limb
Immobility conditions	928	Diagnosis	ICD-9-CM	Crushing injury of lower limb
Immobility conditions	928.0	Diagnosis	ICD-9-CM	Crushing injury of hip and thigh
Immobility conditions	928.1	Diagnosis	ICD-9-CM	Crushing injury of knee and lower leg
Immobility conditions	928.2	Diagnosis	ICD-9-CM	Crushing injury of ankle and foot, excluding toe(s) alone
Immobility conditions	928.3	Diagnosis	ICD-9-CM	Crushing injury of toe(s)
Immobility conditions	928.8	Diagnosis	ICD-9-CM	Crushing injury of multiple sites of lower limb
Immobility conditions	928.9	Diagnosis	ICD-9-CM	Crushing injury of unspecified site of lower limb
Immobility conditions	929	Diagnosis	ICD-9-CM	Crushing injury of multiple and unspecified sites
Immobility conditions	929.0	Diagnosis	ICD-9-CM	Crushing injury of multiple sites, not elsewhere classified
Immobility conditions	929.9	Diagnosis	ICD-9-CM	Crushing injury of unspecified site
Immobility conditions	948.1	Diagnosis	ICD-9-CM	Burn (any degree) involving 10-19% of body surface
Immobility conditions	948.2	Diagnosis	ICD-9-CM	Burn (any degree) involving 20-29% of body surface
Immobility conditions	948.3	Diagnosis	ICD-9-CM	Burn (any degree) involving 30-39% of body surface
Immobility conditions	948.4	Diagnosis	ICD-9-CM	Burn (any degree) involving 40-49% of body surface
Immobility conditions	948.5	Diagnosis	ICD-9-CM	Burn (any degree) involving 50-59% of body surface
Immobility conditions	948.6	Diagnosis	ICD-9-CM	Burn (any degree) involving 60-69% of body surface
Immobility conditions	948.7	Diagnosis	ICD-9-CM	Burn (any degree) involving 70-79% of body surface
Immobility conditions	948.8	Diagnosis	ICD-9-CM	Burn (any degree) involving 80-89% of body surface
Immobility conditions	948.9	Diagnosis	ICD-9-CM	Burn (any degree) involving 90% or more of body surface
Immobility conditions	952	Diagnosis	ICD-9-CM	Spinal cord injury without evidence of spinal bone injury
Immobility conditions	952.0	Diagnosis	ICD-9-CM	Cervical spinal cord injury without evidence of spinal bone injury
Immobility conditions	952.1	Diagnosis	ICD-9-CM	Dorsal (thoracic) spinal cord injury without evidence of spinal bone injury
Immobility conditions	952.2	Diagnosis	ICD-9-CM	Lumbar spinal cord injury without spinal bone injury
Immobility conditions	952.3	Diagnosis	ICD-9-CM	Sacral spinal cord injury without spinal bone injury

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Immobility conditions	952.4	Diagnosis	ICD-9-CM	Cauda equina spinal cord injury without spinal bone injury
Immobility conditions	952.8	Diagnosis	ICD-9-CM	Multiple sites of spinal cord injury without spinal bone injury
Immobility conditions	952.9	Diagnosis	ICD-9-CM	Unspecified site of spinal cord injury without spinal bone injury
Immobility conditions	V54.13	Diagnosis	ICD-9-CM	Aftercare for healing traumatic fracture of hip
Immobility conditions	V54.14	Diagnosis	ICD-9-CM	Aftercare for healing traumatic fracture of leg, unspecified
Immobility conditions	V54.15	Diagnosis	ICD-9-CM	Aftercare for healing traumatic fracture of upper leg
Immobility conditions	V54.16	Diagnosis	ICD-9-CM	Aftercare for healing traumatic fracture of lower leg
Immobility conditions	V54.17	Diagnosis	ICD-9-CM	Aftercare for healing traumatic fracture of vertebrae
Immobility conditions	V54.23	Diagnosis	ICD-9-CM	Aftercare for healing pathologic fracture of hip
Immobility conditions	V54.24	Diagnosis	ICD-9-CM	Aftercare for healing pathologic fracture of leg, unspecified
Immobility conditions	V54.25	Diagnosis	ICD-9-CM	Aftercare for healing pathologic fracture of upper leg
Immobility conditions	V54.26	Diagnosis	ICD-9-CM	Aftercare for healing pathologic fracture of lower leg
Immobility conditions	V54.27	Diagnosis	ICD-9-CM	Aftercare for healing pathologic fracture of vertebrae
Infection diseases	003.1	Diagnosis	ICD-9-CM	Salmonella septicemia
Infection diseases	003.24	Diagnosis	ICD-9-CM	Salmonella osteomyelitis
Infection diseases	020.2	Diagnosis	ICD-9-CM	Septicemic plague
Infection diseases	022.3	Diagnosis	ICD-9-CM	Anthrax septicemia
Infection diseases	036.2	Diagnosis	ICD-9-CM	Meningococemia
Infection diseases	038	Diagnosis	ICD-9-CM	Septicemia
Infection diseases	038.0	Diagnosis	ICD-9-CM	Streptococcal septicemia
Infection diseases	038.1	Diagnosis	ICD-9-CM	Staphylococcal septicemia
Infection diseases	038.2	Diagnosis	ICD-9-CM	Pneumococcal septicemia
Infection diseases	038.3	Diagnosis	ICD-9-CM	Septicemia due to anaerobes
Infection diseases	038.4	Diagnosis	ICD-9-CM	Septicemia due to other gram-negative organisms
Infection diseases	038.8	Diagnosis	ICD-9-CM	Other specified septicemia
Infection diseases	038.9	Diagnosis	ICD-9-CM	Unspecified septicemia
Infection diseases	054.5	Diagnosis	ICD-9-CM	Herpetic septicemia
Infection diseases	449	Diagnosis	ICD-9-CM	Septic arterial embolism
Infection diseases	730.0	Diagnosis	ICD-9-CM	Acute osteomyelitis
Infection diseases	730.00	Diagnosis	ICD-9-CM	Acute osteomyelitis, site unspecified
Infection diseases	730.01	Diagnosis	ICD-9-CM	Acute osteomyelitis, shoulder region
Infection diseases	730.02	Diagnosis	ICD-9-CM	Acute osteomyelitis, upper arm
Infection diseases	730.03	Diagnosis	ICD-9-CM	Acute osteomyelitis, forearm
Infection diseases	730.04	Diagnosis	ICD-9-CM	Acute osteomyelitis, hand
Infection diseases	730.05	Diagnosis	ICD-9-CM	Acute osteomyelitis, pelvic region and thigh
Infection diseases	730.06	Diagnosis	ICD-9-CM	Acute osteomyelitis, lower leg
Infection diseases	730.07	Diagnosis	ICD-9-CM	Acute osteomyelitis, ankle and foot
Infection diseases	730.08	Diagnosis	ICD-9-CM	Acute osteomyelitis, other specified site
Infection diseases	730.09	Diagnosis	ICD-9-CM	Acute osteomyelitis, multiple sites
Infection diseases	730.1	Diagnosis	ICD-9-CM	Chronic osteomyelitis
Infection diseases	730.10	Diagnosis	ICD-9-CM	Chronic osteomyelitis, site unspecified
Infection diseases	730.11	Diagnosis	ICD-9-CM	Chronic osteomyelitis, shoulder region
Infection diseases	730.12	Diagnosis	ICD-9-CM	Chronic osteomyelitis, upper arm
Infection diseases	730.13	Diagnosis	ICD-9-CM	Chronic osteomyelitis, forearm
Infection diseases	730.14	Diagnosis	ICD-9-CM	Chronic osteomyelitis, hand
Infection diseases	730.15	Diagnosis	ICD-9-CM	Chronic osteomyelitis, pelvic region and thigh
Infection diseases	730.16	Diagnosis	ICD-9-CM	Chronic osteomyelitis, lower leg
Infection diseases	730.17	Diagnosis	ICD-9-CM	Chronic osteomyelitis, ankle and foot

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Covariate	Code	Code Category	Code Type	Description
Infection diseases	730.18	Diagnosis	ICD-9-CM	Chronic osteomyelitis, other specified sites
Infection diseases	730.19	Diagnosis	ICD-9-CM	Chronic osteomyelitis, multiple sites
Infection diseases	730.2	Diagnosis	ICD-9-CM	Unspecified osteomyelitis
Infection diseases	730.20	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, site unspecified
Infection diseases	730.21	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, shoulder region
Infection diseases	730.22	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, upper arm
Infection diseases	730.23	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, forearm
Infection diseases	730.24	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, hand
Infection diseases	730.25	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, pelvic region and thigh
Infection diseases	730.26	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, lower leg
Infection diseases	730.27	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, ankle and foot
Infection diseases	730.28	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, other specified sites
Infection diseases	730.29	Diagnosis	ICD-9-CM	Unspecified osteomyelitis, multiple sites
Infection diseases	785.52	Diagnosis	ICD-9-CM	Septic shock
Infection diseases	995.91	Diagnosis	ICD-9-CM	Sepsis
Infection diseases	995.92	Diagnosis	ICD-9-CM	Severe sepsis
Inflammatory conditions	0540F	Procedure	CPT-2	Glucorticoid Management Plan Documented (RA)
Inflammatory conditions	3455F	Procedure	CPT-2	TB screening performed and results interpreted within six months prior to initiation of first-time biologic disease modifying anti-rheumatic drug therapy for RA (RA)
Inflammatory conditions	3470F	Procedure	CPT-2	Rheumatoid arthritis (RA) disease activity, low (RA)
Inflammatory conditions	3471F	Procedure	CPT-2	Rheumatoid arthritis (RA) disease activity, moderate (RA)
Inflammatory conditions	3472F	Procedure	CPT-2	Rheumatoid arthritis (RA) disease activity, high (RA)
Inflammatory conditions	3475F	Procedure	CPT-2	Disease prognosis for rheumatoid arthritis assessed, poor prognosis documented (RA)
Inflammatory conditions	3476F	Procedure	CPT-2	Disease prognosis for rheumatoid arthritis assessed, good prognosis documented (RA)
Inflammatory conditions	4187F	Procedure	CPT-2	Disease modifying anti-rheumatic drug therapy prescribed or dispensed (RA)
Inflammatory conditions	4192F	Procedure	CPT-2	Patient not receiving glucocorticoid therapy (RA)
Inflammatory conditions	4193F	Procedure	CPT-2	Patient receiving <10 mg daily prednisone (or equivalent), or RA activity is worsening, or glucocorticoid use is for less than 6 months (RA)
Inflammatory conditions	4194F	Procedure	CPT-2	Patient receiving >= 10 mg daily prednisone (or equivalent) for longer than 6 months, and improvement or no change in disease activity (RA)
Inflammatory conditions	4195F	Procedure	CPT-2	Patient receiving first-time biologic disease modifying anti-rheumatic drug therapy for rheumatoid arthritis (RA)
Inflammatory conditions	4196F	Procedure	CPT-2	Patient not receiving first-time biologic disease modifying anti-rheumatic drug therapy for rheumatoid arthritis (RA)
Inflammatory conditions	555	Diagnosis	ICD-9-CM	Regional enteritis
Inflammatory conditions	555.0	Diagnosis	ICD-9-CM	Regional enteritis of small intestine
Inflammatory conditions	555.1	Diagnosis	ICD-9-CM	Regional enteritis of large intestine
Inflammatory conditions	555.2	Diagnosis	ICD-9-CM	Regional enteritis of small intestine with large intestine
Inflammatory conditions	555.9	Diagnosis	ICD-9-CM	Regional enteritis of unspecified site
Inflammatory conditions	556	Diagnosis	ICD-9-CM	Ulcerative colitis
Inflammatory conditions	556.0	Diagnosis	ICD-9-CM	Ulcerative (chronic) enterocolitis
Inflammatory conditions	556.1	Diagnosis	ICD-9-CM	Ulcerative (chronic) ileocolitis
Inflammatory conditions	556.2	Diagnosis	ICD-9-CM	Ulcerative (chronic) proctitis
Inflammatory conditions	556.3	Diagnosis	ICD-9-CM	Ulcerative (chronic) proctosigmoiditis
Inflammatory conditions	556.4	Diagnosis	ICD-9-CM	Pseudopolyposis of colon
Inflammatory conditions	556.5	Diagnosis	ICD-9-CM	Left sided ulcerative (chronic) colitis
Inflammatory conditions	556.6	Diagnosis	ICD-9-CM	Universal ulcerative (chronic) colitis
Inflammatory conditions	556.8	Diagnosis	ICD-9-CM	Other ulcerative colitis
Inflammatory conditions	556.9	Diagnosis	ICD-9-CM	Unspecified ulcerative colitis
Inflammatory conditions	564.1	Diagnosis	ICD-9-CM	Irritable bowel syndrome

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Covariate	Code	Code Category	Code Type	Description
Inflammatory conditions	695.4	Diagnosis	ICD-9-CM	Lupus erythematosus
Inflammatory conditions	696	Diagnosis	ICD-9-CM	Psoriasis and similar disorders
Inflammatory conditions	696.1	Diagnosis	ICD-9-CM	Other psoriasis
Inflammatory conditions	696.2	Diagnosis	ICD-9-CM	Parapsoriasis
Inflammatory conditions	696.8	Diagnosis	ICD-9-CM	Psoriasis related disease NEC
Inflammatory conditions	714	Diagnosis	ICD-9-CM	Rheumatoid arthritis and other inflammatory polyarthropathies
Inflammatory conditions	714.0	Diagnosis	ICD-9-CM	Rheumatoid arthritis
Inflammatory conditions	714.1	Diagnosis	ICD-9-CM	Felty's syndrome
Inflammatory conditions	714.2	Diagnosis	ICD-9-CM	Other rheumatoid arthritis with visceral or systemic involvement
Inflammatory conditions	714.3	Diagnosis	ICD-9-CM	Juvenile chronic polyarthritis
Inflammatory conditions	714.4	Diagnosis	ICD-9-CM	Chronic postrheumatic arthropathy
Inflammatory conditions	714.8	Diagnosis	ICD-9-CM	Other specified inflammatory polyarthropathies
Inflammatory conditions	714.9	Diagnosis	ICD-9-CM	Unspecified inflammatory polyarthropathy
Obesity and overweight	278.00	Diagnosis	ICD-9-CM	Obesity, unspecified
Obesity and overweight	278.01	Diagnosis	ICD-9-CM	Morbid obesity
Obesity and overweight	278.02	Diagnosis	ICD-9-CM	Overweight
Obesity and overweight	278.03	Diagnosis	ICD-9-CM	Obesity hypoventilation syndrome
Obesity and overweight	V85.3	Diagnosis	ICD-9-CM	Body Mass Index between 30-39, adult
Obesity and overweight	V85.30	Diagnosis	ICD-9-CM	Body Mass Index 30.0-30.9, adult
Obesity and overweight	V85.31	Diagnosis	ICD-9-CM	Body Mass Index 31.0-31.9, adult
Obesity and overweight	V85.32	Diagnosis	ICD-9-CM	Body Mass Index 32.0-32.9, adult
Obesity and overweight	V85.33	Diagnosis	ICD-9-CM	Body Mass Index 33.0-33.9, adult
Obesity and overweight	V85.34	Diagnosis	ICD-9-CM	Body Mass Index 34.0-34.9, adult
Obesity and overweight	V85.35	Diagnosis	ICD-9-CM	Body Mass Index 35.0-35.9, adult
Obesity and overweight	V85.36	Diagnosis	ICD-9-CM	Body Mass Index 36.0-36.9, adult
Obesity and overweight	V85.37	Diagnosis	ICD-9-CM	Body Mass Index 37.0-37.9, adult
Obesity and overweight	V85.38	Diagnosis	ICD-9-CM	Body Mass Index 38.0-38.9, adult
Obesity and overweight	V85.39	Diagnosis	ICD-9-CM	Body Mass Index 39.0-39.9, adult
Obesity and overweight	V85.4	Diagnosis	ICD-9-CM	Body Mass Index 40 and over, adult
Obesity and overweight	V85.41	Diagnosis	ICD-9-CM	Body Mass Index 40.0-44.9, adult
Obesity and overweight	V85.42	Diagnosis	ICD-9-CM	Body Mass Index 45.0-49.9, adult
Obesity and overweight	V85.43	Diagnosis	ICD-9-CM	Body Mass Index 50.0-59.9, adult
Obesity and overweight	V85.44	Diagnosis	ICD-9-CM	Body Mass Index 60.0-69.9, adult
Obesity and overweight	V85.45	Diagnosis	ICD-9-CM	Body Mass Index 70 and over, adult
Obesity and overweight	V85.54	Diagnosis	ICD-9-CM	Body Mass Index, pediatric, greater than or equal to 95th percentile for age
Renal conditions	36145	Procedure	CPT-4	Introduction of needle or intracatheter; arteriovenous shunt created for dialysis (cannula, fistula, or graft)
Renal conditions	36800	Procedure	CPT-4	Insertion of cannula for hemodialysis, other purpose (separate procedure); vein to vein
Renal conditions	36810	Procedure	CPT-4	Insertion of cannula for hemodialysis, other purpose (separate procedure); arteriovenous, external (Scribner type)
Renal conditions	36815	Procedure	CPT-4	Insertion of cannula for hemodialysis, other purpose (separate procedure); arteriovenous, external revision, or closure
Renal conditions	36825	Procedure	CPT-4	Creation of arteriovenous fistula by other than direct arteriovenous anastomosis (separate procedure); autogenous graft
Renal conditions	36830	Procedure	CPT-4	Creation of arteriovenous fistula by other than direct arteriovenous anastomosis (separate procedure); nonautogenous graft (eg, biological collagen, thermoplastic graft)
Renal conditions	36831	Procedure	CPT-4	Thrombectomy, open, arteriovenous fistula without revision, autogenous or nonautogenous dialysis graft (separate procedure)
Renal conditions	36832	Procedure	CPT-4	Revision, open, arteriovenous fistula; without thrombectomy, autogenous or nonautogenous dialysis graft (separate procedure)

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Renal conditions	36833	Procedure	CPT-4	Revision, open, arteriovenous fistula; with thrombectomy, autogenous or nonautogenous dialysis graft (separate procedure)
Renal conditions	38.95	Procedure	ICD-9-CM	Venous catheterization for renal dialysis
Renal conditions	39.27	Procedure	ICD-9-CM	Arteriovenostomy for renal dialysis
Renal conditions	39.42	Procedure	ICD-9-CM	Revision of arteriovenous shunt for renal dialysis
Renal conditions	39.43	Procedure	ICD-9-CM	Removal of arteriovenous shunt for renal dialysis
Renal conditions	39.53	Procedure	ICD-9-CM	Repair of arteriovenous fistula
Renal conditions	39.93	Procedure	ICD-9-CM	Insertion of vessel-to-vessel cannula
Renal conditions	39.94	Procedure	ICD-9-CM	Replacement of vessel-to-vessel cannula
Renal conditions	39.95	Procedure	ICD-9-CM	Hemodialysis
Renal conditions	458.21	Diagnosis	ICD-9-CM	Hypotension of hemodialysis
Renal conditions	50323	Procedure	CPT-4	Backbench standard preparation of cadaver donor renal allograft prior to transplantation, including dissection and removal of perinephric fat, diaphragmatic and retroperitoneal attachments, excision of adrenal gland, and preparation of ureter(s), renal ve
Renal conditions	50325	Procedure	CPT-4	Backbench standard preparation of living donor renal allograft (open or laparoscopic) prior to transplantation, including dissection and removal of perinephric fat and preparation of ureter(s), renal vein(s), and renal artery(s), ligating branches, as nec
Renal conditions	50327	Procedure	CPT-4	Backbench reconstruction of cadaver or living donor renal allograft prior to transplantation; venous anastomosis, each
Renal conditions	50328	Procedure	CPT-4	Backbench reconstruction of cadaver or living donor renal allograft prior to transplantation; arterial anastomosis, each
Renal conditions	50329	Procedure	CPT-4	Backbench reconstruction of cadaver or living donor renal allograft prior to transplantation; ureteral anastomosis, each
Renal conditions	50340	Procedure	CPT-4	Recipient nephrectomy (separate procedure)
Renal conditions	50341	Procedure	CPT-4	Recipient Nephrectomy (separate Procedure)
Renal conditions	50360	Procedure	CPT-4	Renal allotransplantation, implantation of graft; without recipient nephrectomy
Renal conditions	50365	Procedure	CPT-4	Renal allotransplantation, implantation of graft; with recipient nephrectomy
Renal conditions	50366	Procedure	CPT-4	Renal Homotransplantation, Implantation Of Graft
Renal conditions	54.98	Procedure	ICD-9-CM	Peritoneal dialysis
Renal conditions	581	Diagnosis	ICD-9-CM	Nephrotic syndrome
Renal conditions	581.0	Diagnosis	ICD-9-CM	Nephrotic syndrome with lesion of proliferative glomerulonephritis
Renal conditions	581.1	Diagnosis	ICD-9-CM	Nephrotic syndrome with lesion of membranous glomerulonephritis
Renal conditions	581.2	Diagnosis	ICD-9-CM	Nephrotic syndrome with lesion of membranoproliferative glomerulonephritis
Renal conditions	581.3	Diagnosis	ICD-9-CM	Nephrotic syndrome with lesion of minimal change glomerulonephritis
Renal conditions	581.8	Diagnosis	ICD-9-CM	Nephrotic syndrome with other specified pathological lesion in kidney
Renal conditions	581.9	Diagnosis	ICD-9-CM	Nephrotic syndrome with unspecified pathological lesion in kidney
Renal conditions	582.0	Diagnosis	ICD-9-CM	Chronic glomerulonephritis with lesion of proliferative glomerulonephritis
Renal conditions	582.1	Diagnosis	ICD-9-CM	Chronic glomerulonephritis with lesion of membranous glomerulonephritis
Renal conditions	582.2	Diagnosis	ICD-9-CM	Chronic glomerulonephritis with lesion of membranoproliferative glomerulonephritis
Renal conditions	582.4	Diagnosis	ICD-9-CM	Chronic glomerulonephritis with lesion of rapidly progressive glomerulonephritis
Renal conditions	582.8	Diagnosis	ICD-9-CM	Chronic glomerulonephritis with other specified pathological lesion in kidney
Renal conditions	582.9	Diagnosis	ICD-9-CM	Chronic glomerulonephritis with unspecified pathological lesion in kidney
Renal conditions	583.0	Diagnosis	ICD-9-CM	Nephritis and nephropathy, not specified as acute or chronic, with lesion of proliferative glomerulonephritis
Renal conditions	583.1	Diagnosis	ICD-9-CM	Nephritis and nephropathy, not specified as acute or chronic, with lesion of membranous glomerulonephritis
Renal conditions	583.2	Diagnosis	ICD-9-CM	Nephritis and nephropathy, not specified as acute or chronic, with lesion of membranoproliferative glomerulonephritis
Renal conditions	583.4	Diagnosis	ICD-9-CM	Nephritis and nephropathy, not specified as acute or chronic, with lesion of rapidly progressive glomerulonephritis
Renal conditions	583.6	Diagnosis	ICD-9-CM	Nephritis and nephropathy, not specified as acute or chronic, with lesion of renal cortical necrosis

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Covariate	Code	Code Category	Code Type	Description
Renal conditions	583.7	Diagnosis	ICD-9-CM	Nephritis and nephropathy, not specified as acute or chronic, with lesion of renal medullary necrosis
Renal conditions	583.8	Diagnosis	ICD-9-CM	Nephritis and nephropathy, not specified as acute or chronic, with other specified pathological lesion in kidney
Renal conditions	583.9	Diagnosis	ICD-9-CM	Nephritis and nephropathy, not specified as acute or chronic, with unspecified pathological lesion in kidney
Renal conditions	585	Diagnosis	ICD-9-CM	Chronic kidney disease (CKD)
Renal conditions	585.1	Diagnosis	ICD-9-CM	Chronic kidney disease, Stage I
Renal conditions	585.2	Diagnosis	ICD-9-CM	Chronic kidney disease, Stage II (mild)
Renal conditions	585.3	Diagnosis	ICD-9-CM	Chronic kidney disease, Stage III (moderate)
Renal conditions	585.4	Diagnosis	ICD-9-CM	Chronic kidney disease, Stage IV (severe)
Renal conditions	585.5	Diagnosis	ICD-9-CM	Chronic kidney disease, Stage V
Renal conditions	588.81	Diagnosis	ICD-9-CM	Secondary hyperparathyroidism (of renal origin)
Renal conditions	588.89	Diagnosis	ICD-9-CM	Other specified disorders resulting from impaired renal function
Renal conditions	90918	Procedure	CPT-4	End-stage renal disease (ESRD) related services per full month; for patients younger than two years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	90919	Procedure	CPT-4	End-stage renal disease (ESRD) related services per full month; for patients between two and eleven years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	90920	Procedure	CPT-4	End-stage renal disease (ESRD) related services per full month; for patients between twelve and nineteen years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	90921	Procedure	CPT-4	End-stage renal disease (ESRD) related services per full month; for patients twenty years of age and older
Renal conditions	90922	Procedure	CPT-4	End-stage renal disease (ESRD) related services (less than full month), per day; for patients younger than two years of age
Renal conditions	90923	Procedure	CPT-4	End-stage renal disease (ESRD) related services (less than full month), per day; for patients between two and eleven years of age
Renal conditions	90924	Procedure	CPT-4	End-stage renal disease (ESRD) related services (less than full month), per day; for patients between twelve and nineteen years of age
Renal conditions	90925	Procedure	CPT-4	End-stage renal disease (ESRD) related services (less than full month), per day; for patients twenty years of age and older
Renal conditions	90935	Procedure	CPT-4	Hemodialysis procedure with single evaluation by a physician or other qualified health care professional
Renal conditions	90937	Procedure	CPT-4	Hemodialysis procedure requiring repeated evaluation(s) with or without substantial revision of dialysis prescription
Renal conditions	90939	Procedure	CPT-4	Hemodialysis access flow study to determine blood flow in grafts and arteriovenous fistulae by an indicator dilution method, hook-up; transcutaneous measurement and disconnection
Renal conditions	90940	Procedure	CPT-4	Hemodialysis access flow study to determine blood flow in grafts and arteriovenous fistulae by an indicator method
Renal conditions	90941	Procedure	CPT-4	Hemodialysis, For Acute Renal Failure And Or Intoxication,
Renal conditions	90942	Procedure	CPT-4	Hemodialysis, For Acute Renal Failure And Or Intoxication,
Renal conditions	90943	Procedure	CPT-4	Hemodialysis, For Acute Renal Failure And Or Intoxication,
Renal conditions	90944	Procedure	CPT-4	Hemodialysis, For Acute Renal Failure And Or Intoxication,
Renal conditions	90945	Procedure	CPT-4	Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies), with single evaluation by a physician or other qualified health care professional
Renal conditions	90947	Procedure	CPT-4	Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies) requiring repeated evaluations by a physician or other qualified health care professional, with or without substantial re
Renal conditions	90951	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face visits by a
Renal conditions	90952	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 2-3 face-to-face visits by a physi

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Covariate	Code	Code Category	Code Type	Description
Renal conditions	90953	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 1 face-to-face visit by a physicia
Renal conditions	90954	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face visits by a physician
Renal conditions	90955	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 2-3 face-to-face visits by a physician or ot
Renal conditions	90956	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 1 face-to-face visit by a physician or other
Renal conditions	90957	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face visits by a physicia
Renal conditions	90958	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 2-3 face-to-face visits by a physician or o
Renal conditions	90959	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 1 face-to-face visit by a physician or othe
Renal conditions	90960	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 20 years of age and older; with 4 or more face-to-face visits by a physician or other qualified health care professional per month
Renal conditions	90961	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 20 years of age and older; with 2-3 face-to-face visits by a physician or other qualified health care professional per month
Renal conditions	90962	Procedure	CPT-4	End-stage renal disease (ESRD) related services monthly, for patients 20 years of age and older; with 1 face-to-face visit by a physician or other qualified health care professional per month
Renal conditions	90963	Procedure	CPT-4	End-stage renal disease (ESRD) related services for home dialysis per full month, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	90964	Procedure	CPT-4	End-stage renal disease (ESRD) related services for home dialysis per full month, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	90965	Procedure	CPT-4	End-stage renal disease (ESRD) related services for home dialysis per full month, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	90966	Procedure	CPT-4	End-stage renal disease (ESRD) related services for home dialysis per full month, for patients 20 years of age and older
Renal conditions	90967	Procedure	CPT-4	End-stage renal disease (ESRD) related services for dialysis less than a full month of service, per day; for patients younger than 2 years of age
Renal conditions	90968	Procedure	CPT-4	End-stage renal disease (ESRD) related services for dialysis less than a full month of service, per day; for patients 2-11 years of age
Renal conditions	90969	Procedure	CPT-4	End-stage renal disease (ESRD) related services for dialysis less than a full month of service, per day; for patients 12-19 years of age
Renal conditions	90970	Procedure	CPT-4	End-stage renal disease (ESRD) related services for dialysis less than a full month of service, per day; for patients 20 years of age and older
Renal conditions	90976	Procedure	CPT-4	Peritoneal Dialysis For End-stage Renal Disease (esrd),
Renal conditions	90977	Procedure	CPT-4	Peritoneal Dialysis For End-stage Renal Disease (esrd),
Renal conditions	90978	Procedure	CPT-4	Peritoneal Dialysis For End-stage Renal Disease (esrd),
Renal conditions	90979	Procedure	CPT-4	Peritoneal Dialysis For End-stage Renal Disease (esrd),

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Covariate	Code	Code Category	Code Type	Description
Renal conditions	90982	Procedure	CPT-4	Peritoneal Dialysis For End-stage Renal Disease (esrd),
Renal conditions	90983	Procedure	CPT-4	Peritoneal Dialysis For End-stage Renal Disease (esrd),
Renal conditions	90984	Procedure	CPT-4	Peritoneal Dialysis For End-stage Renal Disease (esrd),
Renal conditions	90985	Procedure	CPT-4	Peritoneal Dialysis For End-stage Renal Disease (esrd),
Renal conditions	90989	Procedure	CPT-4	Dialysis training, patient, including helper where applicable, any mode, completed course
Renal conditions	90993	Procedure	CPT-4	Dialysis training, patient, including helper where applicable, any mode, course not completed, per training session
Renal conditions	90995	Procedure	CPT-4	End Stage Renal Disease (esrd) Related Services, Per Full Month
Renal conditions	90996	Procedure	CPT-4	Continuous Arteriovenous Hemofiltration (cavh) (per Day)
Renal conditions	90997	Procedure	CPT-4	Hemoperfusion (eg, with activated charcoal or resin)
Renal conditions	90998	Procedure	CPT-4	End Stage Renal Disease (esrd) Related Services (less Than Full Month), Per Day
Renal conditions	90999	Procedure	CPT-4	Unlisted dialysis procedure, inpatient or outpatient
Renal conditions	93990	Procedure	CPT-4	Duplex scan of hemodialysis access (including arterial inflow, body of access and venous outflow)
Renal conditions	99512	Procedure	CPT-4	Home visit for hemodialysis
Renal conditions	996.56	Diagnosis	ICD-9-CM	Mechanical complications due to peritoneal dialysis catheter
Renal conditions	996.68	Diagnosis	ICD-9-CM	Infection and inflammatory reaction due to peritoneal dialysis catheter
Renal conditions	996.73	Diagnosis	ICD-9-CM	Other complications due to renal dialysis device, implant, and graft
Renal conditions	A4653	Procedure	HCPCS	Peritoneal dialysis catheter anchoring device, belt, each
Renal conditions	A4656	Procedure	HCPCS	Needle, any size, each
Renal conditions	A4657	Procedure	HCPCS	Syringe, with or without needle, each
Renal conditions	A4670	Procedure	HCPCS	Automatic blood pressure monitor
Renal conditions	A4671	Procedure	HCPCS	Disposable cyclor set used with cyclor dialysis machine, each
Renal conditions	A4672	Procedure	HCPCS	Drainage extension line, sterile, for dialysis, each
Renal conditions	A4673	Procedure	HCPCS	Extension line with easy lock connectors, used with dialysis
Renal conditions	A4674	Procedure	HCPCS	Chemicals/antiseptics solution used to clean/sterilize dialysis equipment, per 8 oz
Renal conditions	A4680	Procedure	HCPCS	Activated carbon filter for hemodialysis, each
Renal conditions	A4706	Procedure	HCPCS	Bicarbonate concentrate, solution, for hemodialysis, per gallon
Renal conditions	A4707	Procedure	HCPCS	Bicarbonate concentrate, powder, for hemodialysis, per packet
Renal conditions	A4708	Procedure	HCPCS	Acetate concentrate solution, for hemodialysis, per gallon
Renal conditions	A4709	Procedure	HCPCS	Acid concentrate, solution, for hemodialysis, per gallon
Renal conditions	A4712	Procedure	HCPCS	Water, sterile, for injection, per 10 ml
Renal conditions	A4714	Procedure	HCPCS	Treated water (deionized, distilled, or reverse osmosis) for peritoneal dialysis, per gallon
Renal conditions	A4719	Procedure	HCPCS	"Y set" tubing for peritoneal dialysis
Renal conditions	A4720	Procedure	HCPCS	Dialysate solution, any concentration of dextrose, fluid volume greater than 249 cc, but less than or equal to 999 cc, for peritoneal dialysis
Renal conditions	A4721	Procedure	HCPCS	Dialysate solution, any concentration of dextrose, fluid volume greater than 999 cc but less than or equal to 1999 cc, for peritoneal dialysis
Renal conditions	A4722	Procedure	HCPCS	Dialysate solution, any concentration of dextrose, fluid volume greater than 1999 cc but less than or equal to 2999 cc, for peritoneal dialysis
Renal conditions	A4723	Procedure	HCPCS	Dialysate solution, any concentration of dextrose, fluid volume greater than 2999 cc but less than or equal to 3999 cc, for peritoneal dialysis
Renal conditions	A4724	Procedure	HCPCS	Dialysate solution, any concentration of dextrose, fluid volume greater than 3999 cc but less than or equal to 4999 cc, for peritoneal dialysis
Renal conditions	A4725	Procedure	HCPCS	Dialysate solution, any concentration of dextrose, fluid volume greater than 4999 cc but less than or equal to 5999 cc, for peritoneal dialysis
Renal conditions	A4726	Procedure	HCPCS	Dialysate solution, any concentration of dextrose, fluid volume greater than 5999 cc, for peritoneal dialysis
Renal conditions	A4728	Procedure	HCPCS	Dialysate solution, nondextrose containing, 500 ml
Renal conditions	A4730	Procedure	HCPCS	Fistula cannulation set for hemodialysis, each
Renal conditions	A4736	Procedure	HCPCS	Topical anesthetic, for dialysis, per g

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Covariate	Code	Code Category	Code Type	Description
Renal conditions	A4737	Procedure	HCPCS	Injectable anesthetic, for dialysis, per 10 ml
Renal conditions	A4740	Procedure	HCPCS	Shunt accessory, for hemodialysis, any type, each
Renal conditions	A4750	Procedure	HCPCS	Blood tubing, arterial or venous, for hemodialysis, each
Renal conditions	A4755	Procedure	HCPCS	Blood tubing, arterial and venous combined, for hemodialysis, each
Renal conditions	A4760	Procedure	HCPCS	Dialysate solution test kit, for peritoneal dialysis, any type, each
Renal conditions	A4765	Procedure	HCPCS	Dialysate concentrate, powder, additive for peritoneal dialysis, per packet
Renal conditions	A4766	Procedure	HCPCS	Dialysate concentrate, solution, additive for peritoneal dialysis, per 10 ml
Renal conditions	A4770	Procedure	HCPCS	Blood collection tube, vacuum, for dialysis, per 50
Renal conditions	A4771	Procedure	HCPCS	Serum clotting time tube, for dialysis, per 50
Renal conditions	A4773	Procedure	HCPCS	Occult blood test strips, for dialysis, per 50
Renal conditions	A4774	Procedure	HCPCS	Ammonia test strips, for dialysis, per 50
Renal conditions	A4802	Procedure	HCPCS	Protamine sulfate, for hemodialysis, per 50 mg
Renal conditions	A4860	Procedure	HCPCS	Disposable catheter tips for peritoneal dialysis, per 10
Renal conditions	A4870	Procedure	HCPCS	Plumbing and/or electrical work for home hemodialysis equipment
Renal conditions	A4890	Procedure	HCPCS	Contracts, repair and maintenance, for hemodialysis equipment
Renal conditions	A4911	Procedure	HCPCS	Drain bag/bottle, for dialysis, each
Renal conditions	A4913	Procedure	HCPCS	Miscellaneous dialysis supplies, not otherwise specified
Renal conditions	A4918	Procedure	HCPCS	Venous pressure clamp, for hemodialysis, each
Renal conditions	A4928	Procedure	HCPCS	Surgical mask, per 20
Renal conditions	A4929	Procedure	HCPCS	Tourniquet for dialysis, each
Renal conditions	C1881	Procedure	HCPCS	Dialysis access system (implantable)
Renal conditions	E1500	Procedure	HCPCS	Centrifuge, for dialysis
Renal conditions	E1520	Procedure	HCPCS	Heparin infusion pump for hemodialysis
Renal conditions	E1530	Procedure	HCPCS	Air bubble detector for hemodialysis, each, replacement
Renal conditions	E1540	Procedure	HCPCS	Pressure alarm for hemodialysis, each, replacement
Renal conditions	E1550	Procedure	HCPCS	Bath conductivity meter for hemodialysis, each
Renal conditions	E1560	Procedure	HCPCS	Blood leak detector for hemodialysis, each, replacement
Renal conditions	E1570	Procedure	HCPCS	Adjustable chair, for ESRD patients
Renal conditions	E1575	Procedure	HCPCS	Transducer protectors/fluid barriers, for hemodialysis, any size, per 10
Renal conditions	E1580	Procedure	HCPCS	Unipuncture control system for hemodialysis
Renal conditions	E1600	Procedure	HCPCS	Delivery and/or installation charges for hemodialysis equipment
Renal conditions	E1610	Procedure	HCPCS	Reverse osmosis water purification system, for hemodialysis
Renal conditions	E1615	Procedure	HCPCS	Deionizer water purification system, for hemodialysis
Renal conditions	E1620	Procedure	HCPCS	Blood pump for hemodialysis, replacement
Renal conditions	E1625	Procedure	HCPCS	Water softening system, for hemodialysis
Renal conditions	E1634	Procedure	HCPCS	Peritoneal dialysis clamps, each
Renal conditions	E1635	Procedure	HCPCS	Compact (portable) travel hemodialyzer system
Renal conditions	E1636	Procedure	HCPCS	Sorbent cartridges, for hemodialysis, per 10
Renal conditions	E1637	Procedure	HCPCS	Hemostats, each
Renal conditions	E1638	Procedure	HCPCS	Heating pad, for peritoneal dialysis, any size, each
Renal conditions	E1639	Procedure	HCPCS	Scale, each
Renal conditions	E1699	Procedure	HCPCS	Dialysis equipment, not otherwise specified
Renal conditions	G0257	Procedure	HCPCS	Unscheduled or emergency dialysis treatment for an ESRD patient in a hospital outpatient department that is not certified as an ESRD facility
Renal conditions	G0308	Procedure	HCPCS	ESRD related services during the course of treatment, for patients under 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face physician visits per

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Covariate	Code	Code Category	Code Type	Description
Renal conditions	G0309	Procedure	HCPCS	ESRD related services during the course of treatment, for patients under 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 2 or 3 face-to-face physician visits per month
Renal conditions	G0310	Procedure	HCPCS	ESRD related services during the course of treatment, for patients under 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 1 face-to-face physician visit per month
Renal conditions	G0311	Procedure	HCPCS	ESRD related services during the course of treatment, for patients between 2 and 11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face physician visits per month
Renal conditions	G0312	Procedure	HCPCS	ESRD related services during the course of treatment, for patients between 2 and 11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 2 or 3 face-to-face physician visits per month
Renal conditions	G0313	Procedure	HCPCS	ESRD related services during the course of treatment, for patients between 2 and 11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 1 face-to-face physician visit per month
Renal conditions	G0314	Procedure	HCPCS	ESRD related services during the course of treatment, for patients between 12 and 19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face physician visits per month
Renal conditions	G0315	Procedure	HCPCS	End Stage Renal disease (ESRD) related services during the course of treatment, for patients between 12 and 19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with two or three face-to-face physician visits per month
Renal conditions	G0316	Procedure	HCPCS	End Stage Renal disease (ESRD) related services during the course of treatment, for patients between 12 and 19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with one face-to-face physician visit per month
Renal conditions	G0317	Procedure	HCPCS	End Stage Renal disease (ESRD) related services during the course of treatment, for patients 20 years of age and over; with four or more face-to-face physician visits per month
Renal conditions	G0318	Procedure	HCPCS	ESRD related services during the course of treatment, for patients 20 years of age and over; with 2 or 3 face-to-face physician visits per month
Renal conditions	G0319	Procedure	HCPCS	End Stage Renal disease (ESRD) related services during the course of treatment, for patients 20 years of age and over; with one face-to-face physician visit per month
Renal conditions	G0320	Procedure	HCPCS	ESRD related services for home dialysis patients per full month; for patients under 2 years of age to include monitoring for adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	G0321	Procedure	HCPCS	ESRD related services for home dialysis patients per full month; for patients 2 to 11 years of age to include monitoring for adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	G0322	Procedure	HCPCS	End Stage Renal disease (ESRD) related services for home dialysis patients per full month; for patients 12 to 19 years of age to include monitoring for adequacy of nutrition, assessment of growth and development, and counseling of parents
Renal conditions	G0323	Procedure	HCPCS	End Stage Renal disease (ESRD) related services for home dialysis patients per full month; for patients 20 years of age and older
Renal conditions	G0324	Procedure	HCPCS	ESRD related services for home dialysis (less than full month), per day; for patients under 2 years of age
Renal conditions	G0325	Procedure	HCPCS	ESRD related services for home dialysis (less than full month), per day; for patients between 2 and 11 years of age
Renal conditions	G0326	Procedure	HCPCS	ESRD related services for home dialysis (less than full month), per day; for patients between twelve and nineteen years of age
Renal conditions	G0327	Procedure	HCPCS	ESRD related services for home dialysis (less than full month), per day; for patients twenty years of age and over
Renal conditions	G0420	Procedure	HCPCS	Face-to-face educational services related to the care of chronic kidney disease; individual, per session, per one hour
Renal conditions	G0421	Procedure	HCPCS	Face-to-face educational services related to the care of chronic kidney disease; group, per session, per one hour
Renal conditions	G8487	Procedure	HCPCS	I intend to report the chronic kidney disease (CKD) measures group
Renal conditions	G8727	Procedure	HCPCS	Patient receiving hemodialysis, peritoneal dialysis or kidney transplantation

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Covariate	Code	Code Category	Code Type	Description
Renal conditions	G8771	Procedure	HCPCS	Documentation of diagnosis of chronic kidney disease
Renal conditions	G9013	Procedure	HCPCS	ESRD demo basic bundle Level I
Renal conditions	G9014	Procedure	HCPCS	ESRD demo expanded bundle including venous access and related services
Renal conditions	J0635	Procedure	HCPCS	Injection, calcitriol, 1 mcg amp.
Renal conditions	J0636	Procedure	HCPCS	Injection, calcitriol, 0.1 mcg
Renal conditions	S2065	Procedure	HCPCS	Simultaneous pancreas kidney transplantation
Renal conditions	S9335	Procedure	HCPCS	Home therapy, hemodialysis; administrative services, professional pharmacy services, care coordination, and all necessary supplies and equipment (drugs and nursing services coded separately), per diem
Renal conditions	S9339	Procedure	HCPCS	Home therapy; peritoneal dialysis, administrative services, professional pharmacy services, care coordination and all necessary supplies and equipment (drugs and nursing visits coded separately), per diem
Renal conditions	V45.1	Diagnosis	ICD-9-CM	Renal dialysis status
Renal conditions	V56	Diagnosis	ICD-9-CM	Encounter for dialysis and dialysis catheter care
Sickle cell anemia	282.41	Diagnosis	ICD-9-CM	Sickle-cell thalassemia without crisis
Sickle cell anemia	282.42	Diagnosis	ICD-9-CM	Sickle-cell thalassemia with crisis
Sickle cell anemia	282.6	Diagnosis	ICD-9-CM	Sickle-cell disease
Sickle cell anemia	282.60	Diagnosis	ICD-9-CM	Sickle-cell disease, unspecified
Sickle cell anemia	282.63	Diagnosis	ICD-9-CM	Sickle-cell/Hb-C disease without crisis
Sickle cell anemia	282.64	Diagnosis	ICD-9-CM	Sickle-cell/Hb-C disease with crisis
Sickle cell anemia	282.68	Diagnosis	ICD-9-CM	Other sickle-cell disease without crisis
Sickle cell anemia	282.69	Diagnosis	ICD-9-CM	Other sickle-cell disease with crisis
Surgery	00.7	Procedure	ICD-9-CM	Other hip procedures
Surgery	00.71	Procedure	ICD-9-CM	Revision of hip replacement, acetabular component
Surgery	00.72	Procedure	ICD-9-CM	Revision of hip replacement, femoral component
Surgery	00.73	Procedure	ICD-9-CM	Revision of hip replacement, acetabular liner and/or femoral head only
Surgery	00.74	Procedure	ICD-9-CM	Hip bearing surface, metal-on-polyethylene
Surgery	00.75	Procedure	ICD-9-CM	Hip bearing surface, metal-on-metal
Surgery	00.76	Procedure	ICD-9-CM	Hip bearing surface, ceramic-on-ceramic
Surgery	00.77	Procedure	ICD-9-CM	Hip bearing surface, ceramic-on-polyethylene
Surgery	00.80	Procedure	ICD-9-CM	Revision of knee replacement, total (all components)
Surgery	00.81	Procedure	ICD-9-CM	Revision of knee replacement, tibial component
Surgery	00.82	Procedure	ICD-9-CM	Revision of knee replacement, femoral component
Surgery	00.83	Procedure	ICD-9-CM	Revision of knee replacement, patellar component
Surgery	00.84	Procedure	ICD-9-CM	Revision of total knee replacement, tibial insert (liner)
Surgery	00.85	Procedure	ICD-9-CM	Resurfacing hip, total, acetabulum and femoral head
Surgery	00.86	Procedure	ICD-9-CM	Resurfacing hip, partial, femoral head
Surgery	00.87	Procedure	ICD-9-CM	Resurfacing hip, partial, acetabulum
Surgery	00797	Procedure	CPT-4	Anesthesia for intraperitoneal procedures in upper abdomen including laparoscopy; gastric restrictive procedure for morbid obesity
Surgery	01.2	Procedure	ICD-9-CM	Craniotomy and craniectomy
Surgery	01.20	Procedure	ICD-9-CM	Cranial implantation or replacement of neurostimulator pulse generator
Surgery	01.21	Procedure	ICD-9-CM	Incision and drainage of cranial sinus
Surgery	01.22	Procedure	ICD-9-CM	Removal of intracranial neurostimulator lead(s)
Surgery	01.23	Procedure	ICD-9-CM	Reopening of craniotomy site
Surgery	01.24	Procedure	ICD-9-CM	Other craniotomy
Surgery	01.25	Procedure	ICD-9-CM	Other craniectomy
Surgery	01.26	Procedure	ICD-9-CM	Insertion of catheter(s) into cranial cavity or tissue
Surgery	01.27	Procedure	ICD-9-CM	Removal of catheter(s) from cranial cavity or tissue
Surgery	01.28	Procedure	ICD-9-CM	Placement of intracerebral catheter(s) via burr hole(s)

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	01.29	Procedure	ICD-9-CM	Removal of cranial neurostimulator pulse generator
Surgery	01214	Procedure	CPT-4	Anesthesia for open procedures involving hip joint; total hip arthroplasty
Surgery	01215	Procedure	CPT-4	Anesthesia for open procedures involving hip joint; revision of total hip arthroplasty
Surgery	01402	Procedure	CPT-4	Anesthesia for open or surgical arthroscopic procedures on knee joint; total knee arthroplasty
Surgery	03.0	Procedure	ICD-9-CM	Exploration and decompression of spinal canal structures
Surgery	03.01	Procedure	ICD-9-CM	Removal of foreign body from spinal canal
Surgery	03.02	Procedure	ICD-9-CM	Reopening of laminectomy site
Surgery	03.09	Procedure	ICD-9-CM	Other exploration and decompression of spinal canal
Surgery	03.5	Procedure	ICD-9-CM	Plastic operations on spinal cord structures
Surgery	03.51	Procedure	ICD-9-CM	Repair of spinal meningocele
Surgery	03.52	Procedure	ICD-9-CM	Repair of spinal myelomeningocele
Surgery	03.53	Procedure	ICD-9-CM	Repair of vertebral fracture
Surgery	03.59	Procedure	ICD-9-CM	Other repair and plastic operations on spinal cord structures
Surgery	22100	Procedure	CPT-4	Partial excision of posterior vertebral component (eg, spinous process, lamina or facet) for intrinsic bony lesion, single vertebral segment; cervical
Surgery	22101	Procedure	CPT-4	Partial excision of posterior vertebral component (eg, spinous process, lamina or facet) for intrinsic bony lesion, single vertebral segment; thoracic
Surgery	22102	Procedure	CPT-4	Partial excision of posterior vertebral component (eg, spinous process, lamina or facet) for intrinsic bony lesion, single vertebral segment; lumbar
Surgery	22103	Procedure	CPT-4	Partial excision of posterior vertebral component (eg, spinous process, lamina or facet) for intrinsic bony lesion, single vertebral segment; each additional segment (List separately in addition to code for primary procedure)
Surgery	22532	Procedure	CPT-4	Arthrodesis, lateral extracavitary technique, including minimal discectomy to prepare interspace (other than for decompression); thoracic
Surgery	22533	Procedure	CPT-4	Arthrodesis, lateral extracavitary technique, including minimal discectomy to prepare interspace (other than for decompression); lumbar
Surgery	22534	Procedure	CPT-4	Arthrodesis, lateral extracavitary technique, including minimal discectomy to prepare interspace (other than for decompression); thoracic or lumbar, each additional vertebral segment (List separately in addition to code for primary procedure)
Surgery	22548	Procedure	CPT-4	Arthrodesis, anterior transoral or extraoral technique, clivus-C1-C2 (atlas-axis), with or without excision of odontoid process
Surgery	22550	Procedure	CPT-4	Arthrodesis With Discectomy, Cervical,
Surgery	22551	Procedure	CPT-4	Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophyctomy and decompression of spinal cord and/or nerve roots; cervical below C2
Surgery	22552	Procedure	CPT-4	Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophyctomy and decompression of spinal cord and/or nerve roots; cervical below C2, each additional interspace (List separately in addition to code for separate procedure)
Surgery	22554	Procedure	CPT-4	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); cervical below C2
Surgery	22555	Procedure	CPT-4	Arthrodesis With Discectomy, Cervical, Anterior
Surgery	22556	Procedure	CPT-4	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); thoracic
Surgery	22558	Procedure	CPT-4	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); lumbar
Surgery	22560	Procedure	CPT-4	Arthrodesis With Discectomy, Lumbar Or Thoracic,
Surgery	22561	Procedure	CPT-4	Arthrodesis With Discectomy, Lumbar Or Thoracic,
Surgery	22565	Procedure	CPT-4	Arthrodesis With Discectomy, Lower Lumbar Spine,
Surgery	22585	Procedure	CPT-4	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); each additional interspace (List separately in addition to code for primary procedure)

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	22586	Procedure	CPT-4	Arthrodesis, pre-sacral interbody technique, including disc space preparation, discectomy, with posterior instrumentation, with image guidance, includes bone graft when performed, L5-S1 interspace
Surgery	22590	Procedure	CPT-4	Arthrodesis, posterior technique, craniocervical (occiput-C2)
Surgery	22595	Procedure	CPT-4	Arthrodesis, posterior technique, atlas-axis (C1-C2)
Surgery	22600	Procedure	CPT-4	Arthrodesis, posterior or posterolateral technique, single level; cervical below C2 segment
Surgery	22605	Procedure	CPT-4	Cervical Fusion, Posterior Approach, Below C1 Level;
Surgery	22610	Procedure	CPT-4	Arthrodesis, posterior or posterolateral technique, single level; thoracic (with lateral transverse technique, when performed)
Surgery	22612	Procedure	CPT-4	Arthrodesis, posterior or posterolateral technique, single level; lumbar (with lateral transverse technique, when performed)
Surgery	22614	Procedure	CPT-4	Arthrodesis, posterior or posterolateral technique, single level; each additional vertebral segment (List separately in addition to code for primary procedure)
Surgery	22615	Procedure	CPT-4	Cervical Fusion, Anterior Approach (c3-t1) With Iliac
Surgery	22617	Procedure	CPT-4	Atlas-axis Fusion (c1-c2 Or C3) With Iliac Or
Surgery	22620	Procedure	CPT-4	Cervicocranial Fusion (occiput Through C2) With
Surgery	22625	Procedure	CPT-4	ARTHRODESIS LAT TRANSVERSE W/GFT-INT FIXA LUMBAR
Surgery	22630	Procedure	CPT-4	Arthrodesis, posterior interbody technique, including laminectomy and/or discectomy to prepare interspace (other than for decompression), single interspace; lumbar
Surgery	22632	Procedure	CPT-4	Arthrodesis, posterior interbody technique, including laminectomy and/or discectomy to prepare interspace (other than for decompression), single interspace; each additional interspace (List separately in addition to code for primary procedure)
Surgery	22800	Procedure	CPT-4	Arthrodesis, posterior, for spinal deformity, with or without cast; up to 6 vertebral segments
Surgery	22801	Procedure	CPT-4	Arthrodesis, Primary For Scoliosis With Or Without
Surgery	22802	Procedure	CPT-4	Arthrodesis, posterior, for spinal deformity, with or without cast; 7 to 12 vertebral segments
Surgery	22803	Procedure	CPT-4	Arthrodesis, Primary For Scoliosis With Or Without
Surgery	22804	Procedure	CPT-4	Arthrodesis, posterior, for spinal deformity, with or without cast; 13 or more vertebral segments
Surgery	22808	Procedure	CPT-4	Arthrodesis, anterior, for spinal deformity, with or without cast; 2 to 3 vertebral segments
Surgery	22810	Procedure	CPT-4	Arthrodesis, anterior, for spinal deformity, with or without cast; 4 to 7 vertebral segments
Surgery	22812	Procedure	CPT-4	Arthrodesis, anterior, for spinal deformity, with or without cast; 8 or more vertebral segments
Surgery	22818	Procedure	CPT-4	Kyphectomy, circumferential exposure of spine and resection of vertebral segment(s) (including body and posterior elements); single or 2 segments
Surgery	22819	Procedure	CPT-4	Kyphectomy, circumferential exposure of spine and resection of vertebral segment(s) (including body and posterior elements); 3 or more segments
Surgery	22840	Procedure	CPT-4	Posterior non-segmental instrumentation (eg, Harrington rod technique, pedicle fixation across 1 interspace, atlantoaxial transarticular screw fixation, sublaminar wiring at C1, facet screw fixation) (List separately in addition to code for primary proced
Surgery	22841	Procedure	CPT-4	Internal spinal fixation by wiring of spinous processes (List separately in addition to code for primary procedure)
Surgery	22842	Procedure	CPT-4	Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 3 to 6 vertebral segments (List separately in addition to code for primary procedure)
Surgery	22843	Procedure	CPT-4	Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 7 to 12 vertebral segments (List separately in addition to code for primary procedure)
Surgery	22844	Procedure	CPT-4	Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 13 or more vertebral segments (List separately in addition to code for primary procedure)
Surgery	22845	Procedure	CPT-4	Anterior instrumentation; 2 to 3 vertebral segments (List separately in addition to code for primary procedure)
Surgery	22846	Procedure	CPT-4	Anterior instrumentation; 4 to 7 vertebral segments (List separately in addition to code for primary procedure)
Surgery	22847	Procedure	CPT-4	Anterior instrumentation; 8 or more vertebral segments (List separately in addition to code for primary procedure)
Surgery	22848	Procedure	CPT-4	Pelvic fixation (attachment of caudal end of instrumentation to pelvic bony structures) other than sacrum (List separately in addition to code for primary procedure)

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	22849	Procedure	CPT-4	Reinsertion of spinal fixation device
Surgery	22850	Procedure	CPT-4	Removal of posterior nonsegmental instrumentation (eg, Harrington rod)
Surgery	22851	Procedure	CPT-4	Application of intervertebral biomechanical device(s) (eg, synthetic cage(s), methylmethacrylate) to vertebral defect or interspace (List separately in addition to code for primary procedure)
Surgery	22852	Procedure	CPT-4	Removal of posterior segmental instrumentation
Surgery	22855	Procedure	CPT-4	Removal of anterior instrumentation
Surgery	26992	Procedure	CPT-4	Incision, bone cortex, pelvis and/or hip joint (eg, osteomyelitis or bone abscess)
Surgery	27050	Procedure	CPT-4	Arthrotomy, with biopsy; sacroiliac joint
Surgery	27052	Procedure	CPT-4	Arthrotomy, with biopsy; hip joint
Surgery	27054	Procedure	CPT-4	Arthrotomy with synovectomy, hip joint
Surgery	27057	Procedure	CPT-4	Decompression fasciotomy(ies), pelvic (buttock) compartment(s) (eg, gluteus medius-minimus, gluteus maximus, iliopsoas, and/or tensor fascia lata muscle) with debridement of nonviable muscle, unilateral
Surgery	27059	Procedure	CPT-4	Radical resection of tumor (eg, sarcoma), soft tissue of pelvis and hip area; 5 cm or greater
Surgery	27060	Procedure	CPT-4	Excision; ischial bursa
Surgery	27062	Procedure	CPT-4	Excision; trochanteric bursa or calcification
Surgery	27065	Procedure	CPT-4	Excision of bone cyst or benign tumor, wing of ilium, symphysis pubis, or greater trochanter of femur; superficial, includes autograft, when performed
Surgery	27066	Procedure	CPT-4	Excision of bone cyst or benign tumor, wing of ilium, symphysis pubis, or greater trochanter of femur; deep (subfascial), includes autograft, when performed
Surgery	27067	Procedure	CPT-4	Excision of bone cyst or benign tumor, wing of ilium, symphysis pubis, or greater trochanter of femur; with autograft requiring separate incision
Surgery	27070	Procedure	CPT-4	Partial excision, wing of ilium, symphysis pubis, or greater trochanter of femur, (craterization, saucerization) (eg, osteomyelitis or bone abscess); superficial
Surgery	27071	Procedure	CPT-4	Partial excision, wing of ilium, symphysis pubis, or greater trochanter of femur, (craterization, saucerization) (eg, osteomyelitis or bone abscess); deep (subfascial or intramuscular)
Surgery	27075	Procedure	CPT-4	Radical resection of tumor; wing of ilium, 1 pubic or ischial ramus or symphysis pubis
Surgery	27076	Procedure	CPT-4	Radical resection of tumor; ilium, including acetabulum, both pubic rami, or ischium and acetabulum
Surgery	27077	Procedure	CPT-4	Radical resection of tumor; innominate bone, total
Surgery	27078	Procedure	CPT-4	Radical resection of tumor; ischial tuberosity and greater trochanter of femur
Surgery	27097	Procedure	CPT-4	Release or recession, hamstring, proximal
Surgery	27098	Procedure	CPT-4	Transfer, adductor to ischium
Surgery	27100	Procedure	CPT-4	Transfer external oblique muscle to greater trochanter including fascial or tendon extension (graft)
Surgery	27105	Procedure	CPT-4	Transfer paraspinal muscle to hip (includes fascial or tendon extension graft)
Surgery	27110	Procedure	CPT-4	Transfer iliopsoas; to greater trochanter of femur
Surgery	27111	Procedure	CPT-4	Transfer iliopsoas; to femoral neck
Surgery	27115	Procedure	CPT-4	Muscle Release, Complete (hanging Hip Operation)
Surgery	27120	Procedure	CPT-4	Acetabuloplasty; (eg, Whitman, Colonna, Haygroves, or cup type)
Surgery	27122	Procedure	CPT-4	Acetabuloplasty; resection, femoral head (eg, Girdlestone procedure)
Surgery	27125	Procedure	CPT-4	Hemiarthroplasty, hip, partial (eg, femoral stem prosthesis, bipolar arthroplasty)
Surgery	27126	Procedure	CPT-4	Partial Hip Replacement (hemiarthroplasty); Cup
Surgery	27127	Procedure	CPT-4	Partial Hip Replacement (hemiarthroplasty); Cup With Acetabuloplasty
Surgery	27130	Procedure	CPT-4	Arthroplasty, acetabular and proximal femoral prosthetic replacement (total hip arthroplasty), with or without autograft or allograft
Surgery	27131	Procedure	CPT-4	Arthroplasty, Acetabular And Proximal Femoral
Surgery	27132	Procedure	CPT-4	Conversion of previous hip surgery to total hip arthroplasty, with or without autograft or allograft
Surgery	27134	Procedure	CPT-4	Revision of total hip arthroplasty; both components, with or without autograft or allograft
Surgery	27135	Procedure	CPT-4	Secondary Reconstruction Or Revision Of
Surgery	27137	Procedure	CPT-4	Revision of total hip arthroplasty; acetabular component only, with or without autograft or allograft

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	27138	Procedure	CPT-4	Revision of total hip arthroplasty; femoral component only, with or without allograft
Surgery	27140	Procedure	CPT-4	Osteotomy and transfer of greater trochanter of femur (separate procedure)
Surgery	27146	Procedure	CPT-4	Osteotomy, iliac, acetabular or innominate bone;
Surgery	27147	Procedure	CPT-4	Osteotomy, iliac, acetabular or innominate bone; with open reduction of hip
Surgery	27151	Procedure	CPT-4	Osteotomy, iliac, acetabular or innominate bone; with femoral osteotomy
Surgery	27156	Procedure	CPT-4	Osteotomy, iliac, acetabular or innominate bone; with femoral osteotomy and with open reduction of hip
Surgery	27157	Procedure	CPT-4	Acetabular Augmentation (wilson Procedure)
Surgery	27158	Procedure	CPT-4	Osteotomy, pelvis, bilateral (eg, congenital malformation)
Surgery	27161	Procedure	CPT-4	Osteotomy, femoral neck (separate procedure)
Surgery	27165	Procedure	CPT-4	Osteotomy, intertrochanteric or subtrochanteric including internal or external fixation and/or cast
Surgery	27170	Procedure	CPT-4	Bone graft, femoral head, neck, intertrochanteric or subtrochanteric area (includes obtaining bone graft)
Surgery	27175	Procedure	CPT-4	Treatment of slipped femoral epiphysis; by traction, without reduction
Surgery	27176	Procedure	CPT-4	Treatment of slipped femoral epiphysis; by single or multiple pinning, in situ
Surgery	27177	Procedure	CPT-4	Open treatment of slipped femoral epiphysis; single or multiple pinning or bone graft (includes obtaining graft)
Surgery	27178	Procedure	CPT-4	Open treatment of slipped femoral epiphysis; closed manipulation with single or multiple pinning
Surgery	27179	Procedure	CPT-4	Open treatment of slipped femoral epiphysis; osteoplasty of femoral neck (Heyman type procedure)
Surgery	27181	Procedure	CPT-4	Open treatment of slipped femoral epiphysis; osteotomy and internal fixation
Surgery	27185	Procedure	CPT-4	Epiphyseal arrest by epiphysiodesis or stapling, greater trochanter of femur
Surgery	27187	Procedure	CPT-4	Prophylactic treatment (nailing, pinning, plating or wiring) with or without methylmethacrylate, femoral neck and proximal femur
Surgery	27202	Procedure	CPT-4	Open treatment of coccygeal fracture
Surgery	27215	Procedure	CPT-4	Open treatment of iliac spine(s), tuberosity avulsion, or iliac wing fracture(s), unilateral, for pelvic bone fracture patterns that do not disrupt the pelvic ring, includes internal fixation, when performed
Surgery	27217	Procedure	CPT-4	Open treatment of anterior pelvic bone fracture and/or dislocation for fracture patterns that disrupt the pelvic ring, unilateral, includes internal fixation, when performed (includes pubic symphysis and/or ipsilateral superior/inferior rami)
Surgery	27218	Procedure	CPT-4	Open treatment of posterior pelvic bone fracture and/or dislocation, for fracture patterns that disrupt the pelvic ring, unilateral, includes internal fixation, when performed (includes ipsilateral ilium, sacroiliac joint and/or sacrum)
Surgery	27226	Procedure	CPT-4	Open treatment of posterior or anterior acetabular wall fracture, with internal fixation
Surgery	27227	Procedure	CPT-4	Open treatment of acetabular fracture(s) involving anterior or posterior (one) column, or a fracture running transversely across the acetabulum, with internal fixation
Surgery	27228	Procedure	CPT-4	Open treatment of acetabular fracture(s) involving anterior and posterior (two) columns, includes T-fracture and both column fracture with complete articular detachment, or single column or transverse fracture with associated acetabular wall fracture, wit
Surgery	27236	Procedure	CPT-4	Open treatment of femoral fracture, proximal end, neck, internal fixation or prosthetic replacement
Surgery	27248	Procedure	CPT-4	Open treatment of greater trochanteric fracture, includes internal fixation, when performed
Surgery	27253	Procedure	CPT-4	Open treatment of hip dislocation, traumatic, without internal fixation
Surgery	27254	Procedure	CPT-4	Open treatment of hip dislocation, traumatic, with acetabular wall and femoral head fracture, with or without internal or external fixation
Surgery	27258	Procedure	CPT-4	Open treatment of spontaneous hip dislocation (developmental, including congenital or pathological), replacement of femoral head in acetabulum (including tenotomy, etc);
Surgery	27269	Procedure	CPT-4	Open treatment of femoral fracture, proximal end, head, includes internal fixation, when performed
Surgery	27437	Procedure	CPT-4	Arthroplasty, patella; without prosthesis
Surgery	27438	Procedure	CPT-4	Arthroplasty, patella; with prosthesis
Surgery	27440	Procedure	CPT-4	Arthroplasty, knee, tibial plateau;
Surgery	27441	Procedure	CPT-4	Arthroplasty, knee, tibial plateau; with debridement and partial synovectomy
Surgery	27442	Procedure	CPT-4	Arthroplasty, femoral condyles or tibial plateau(s), knee;
Surgery	27443	Procedure	CPT-4	Arthroplasty, femoral condyles or tibial plateau(s), knee; with debridement and partial synovectomy

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	27444	Procedure	CPT-4	Arthroplasty, Knee, Total;
Surgery	27445	Procedure	CPT-4	Arthroplasty, knee, hinge prosthesis (eg, Walldius type)
Surgery	27446	Procedure	CPT-4	Arthroplasty, knee, condyle and plateau; medial OR lateral compartment
Surgery	27447	Procedure	CPT-4	Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty)
Surgery	27486	Procedure	CPT-4	Revision of total knee arthroplasty, with or without allograft; 1 component
Surgery	27487	Procedure	CPT-4	Revision of total knee arthroplasty, with or without allograft; femoral and entire tibial component
Surgery	27506	Procedure	CPT-4	Open treatment of femoral shaft fracture, with or without external fixation, with insertion of intramedullary implant, with or without cerclage and/or locking screws
Surgery	27507	Procedure	CPT-4	Open treatment of femoral shaft fracture with plate/screws, with or without cerclage
Surgery	27511	Procedure	CPT-4	Open treatment of femoral supracondylar or transcondylar fracture without intercondylar extension, includes internal fixation, when performed
Surgery	27513	Procedure	CPT-4	Open treatment of femoral supracondylar or transcondylar fracture with intercondylar extension, includes internal fixation, when performed
Surgery	27514	Procedure	CPT-4	Open treatment of femoral fracture, distal end, medial or lateral condyle, includes internal fixation, when performed
Surgery	27519	Procedure	CPT-4	Open treatment of distal femoral epiphyseal separation, includes internal fixation, when performed
Surgery	27524	Procedure	CPT-4	Open treatment of patellar fracture, with internal fixation and/or partial or complete patellectomy and soft tissue repair
Surgery	27535	Procedure	CPT-4	Open treatment of tibial fracture, proximal (plateau); unicondylar, includes internal fixation, when performed
Surgery	27540	Procedure	CPT-4	Open treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, includes internal fixation, when performed
Surgery	27556	Procedure	CPT-4	Open treatment of knee dislocation, includes internal fixation, when performed; without primary ligamentous repair or augmentation/reconstruction
Surgery	27566	Procedure	CPT-4	Open treatment of patellar dislocation, with or without partial or total patellectomy
Surgery	43.7	Procedure	ICD-9-CM	Partial gastrectomy with anastomosis to jejunum
Surgery	43.82	Procedure	ICD-9-CM	Laparoscopic vertical (sleeve) gastrectomy
Surgery	43.89	Procedure	ICD-9-CM	Open and other partial gastrectomy
Surgery	43644	Procedure	CPT-4	Laparoscopy, surgical, gastric restrictive procedure; with gastric bypass and Roux-en-Y gastroenterostomy (roux limb 150 cm or less)
Surgery	43645	Procedure	CPT-4	Laparoscopy, surgical, gastric restrictive procedure; with gastric bypass and small intestine reconstruction to limit absorption
Surgery	43770	Procedure	CPT-4	Laparoscopy, surgical, gastric restrictive procedure; placement of adjustable gastric restrictive device (eg, gastric band and subcutaneous port components)
Surgery	43771	Procedure	CPT-4	Laparoscopy, surgical, gastric restrictive procedure; revision of adjustable gastric restrictive device component only
Surgery	43772	Procedure	CPT-4	Laparoscopy, surgical, gastric restrictive procedure; removal of adjustable gastric restrictive device component only
Surgery	43773	Procedure	CPT-4	Laparoscopy, surgical, gastric restrictive procedure; removal and replacement of adjustable gastric restrictive device component only
Surgery	43774	Procedure	CPT-4	Laparoscopy, surgical, gastric restrictive procedure; removal of adjustable gastric restrictive device and subcutaneous port components
Surgery	43775	Procedure	CPT-4	Laparoscopy, surgical, gastric restrictive procedure; longitudinal gastrectomy (ie, sleeve gastrectomy)
Surgery	43842	Procedure	CPT-4	Gastric restrictive procedure, without gastric bypass, for morbid obesity; vertical-banded gastroplasty
Surgery	43843	Procedure	CPT-4	Gastric restrictive procedure, without gastric bypass, for morbid obesity; other than vertical-banded gastroplasty
Surgery	43844	Procedure	CPT-4	GASTRIC BYPASS NOT ROUX-EN-Y GASTROENTEROSTOMY
Surgery	43845	Procedure	CPT-4	Gastric restrictive procedure with partial gastrectomy, pylorus-preserving duodenoileostomy and ileoileostomy (50 to 100 cm common channel) to limit absorption (biliopancreatic diversion with duodenal switch)
Surgery	43846	Procedure	CPT-4	Gastric restrictive procedure, with gastric bypass for morbid obesity; with short limb (150 cm or less) Roux-en-Y gastroenterostomy

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	43847	Procedure	CPT-4	Gastric restrictive procedure, with gastric bypass for morbid obesity; with small intestine reconstruction to limit absorption
Surgery	43848	Procedure	CPT-4	Revision, open, of gastric restrictive procedure for morbid obesity, other than adjustable gastric restrictive device (separate procedure)
Surgery	43850	Procedure	CPT-4	Revision of gastroduodenal anastomosis (gastroduodenostomy) with reconstruction; without vagotomy
Surgery	43855	Procedure	CPT-4	Revision of gastroduodenal anastomosis (gastroduodenostomy) with reconstruction; with vagotomy
Surgery	43860	Procedure	CPT-4	Revision of gastrojejunal anastomosis (gastrojejunostomy) with reconstruction, with or without partial gastrectomy or intestine resection; without vagotomy
Surgery	43865	Procedure	CPT-4	Revision of gastrojejunal anastomosis (gastrojejunostomy) with reconstruction, with or without partial gastrectomy or intestine resection; with vagotomy
Surgery	43886	Procedure	CPT-4	Gastric restrictive procedure, open; revision of subcutaneous port component only
Surgery	43887	Procedure	CPT-4	Gastric restrictive procedure, open; removal of subcutaneous port component only
Surgery	43888	Procedure	CPT-4	Gastric restrictive procedure, open; removal and replacement of subcutaneous port component only
Surgery	44.31	Procedure	ICD-9-CM	High gastric bypass
Surgery	44.38	Procedure	ICD-9-CM	Laparoscopic gastroenterostomy
Surgery	44.39	Procedure	ICD-9-CM	Other gastroenterostomy without gastrectomy
Surgery	44.5	Procedure	ICD-9-CM	Revision of gastric anastomosis
Surgery	44.68	Procedure	ICD-9-CM	Laparoscopic gastroplasty
Surgery	44.69	Procedure	ICD-9-CM	Other repair of stomach
Surgery	44.95	Procedure	ICD-9-CM	Laparoscopic gastric restrictive procedure
Surgery	44.96	Procedure	ICD-9-CM	Laparoscopic revision of gastric restrictive procedure
Surgery	44.97	Procedure	ICD-9-CM	Laparoscopic removal of gastric restrictive device(s)
Surgery	44.98	Procedure	ICD-9-CM	(Laparoscopic) adjustment of size of adjustable gastric restrictive device
Surgery	44.99	Procedure	ICD-9-CM	Other operations on stomach
Surgery	44005	Procedure	CPT-4	Enterolysis (freeing of intestinal adhesion) (separate procedure)
Surgery	44120	Procedure	CPT-4	Enterectomy, resection of small intestine; single resection and anastomosis
Surgery	44121	Procedure	CPT-4	Enterectomy, resection of small intestine; each additional resection and anastomosis (List separately in addition to code for primary procedure)
Surgery	44125	Procedure	CPT-4	Enterectomy, resection of small intestine; with enterostomy
Surgery	44126	Procedure	CPT-4	Enterectomy, resection of small intestine for congenital atresia, single resection and anastomosis of proximal segment of intestine; without tapering
Surgery	44127	Procedure	CPT-4	Enterectomy, resection of small intestine for congenital atresia, single resection and anastomosis of proximal segment of intestine; with tapering
Surgery	44128	Procedure	CPT-4	Enterectomy, resection of small intestine for congenital atresia, single resection and anastomosis of proximal segment of intestine; each additional resection and anastomosis (List separately in addition to code for primary procedure)
Surgery	44139	Procedure	CPT-4	Mobilization (take-down) of splenic flexure performed in conjunction with partial colectomy (List separately in addition to primary procedure)
Surgery	44140	Procedure	CPT-4	Colectomy, partial; with anastomosis
Surgery	44141	Procedure	CPT-4	Colectomy, partial; with skin level cecostomy or colostomy
Surgery	44143	Procedure	CPT-4	Colectomy, partial; with end colostomy and closure of distal segment (Hartmann type procedure)
Surgery	44144	Procedure	CPT-4	Colectomy, partial; with resection, with colostomy or ileostomy and creation of mucofistula
Surgery	44145	Procedure	CPT-4	Colectomy, partial; with coloproctostomy (low pelvic anastomosis)
Surgery	44146	Procedure	CPT-4	Colectomy, partial; with coloproctostomy (low pelvic anastomosis), with colostomy
Surgery	44147	Procedure	CPT-4	Colectomy, partial; abdominal and transanal approach
Surgery	44150	Procedure	CPT-4	Colectomy, total, abdominal, without proctectomy; with ileostomy or ileoproctostomy
Surgery	44151	Procedure	CPT-4	Colectomy, total, abdominal, without proctectomy; with continent ileostomy

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	44152	Procedure	CPT-4	Colectomy, total, abdominal, without proctectomy; with rectal mucosectomy, ileoanal anastomosis, with or without loop ileostomy
Surgery	44153	Procedure	CPT-4	Colectomy, total, abdominal, without proctectomy; with rectal mucosectomy, ileoanal anastomosis, creation of ileal reservoir (S or J), with or without loop ileostomy
Surgery	44155	Procedure	CPT-4	Colectomy, total, abdominal, with proctectomy; with ileostomy
Surgery	44156	Procedure	CPT-4	Colectomy, total, abdominal, with proctectomy; with continent ileostomy
Surgery	44157	Procedure	CPT-4	Colectomy, total, abdominal, with proctectomy; with ileoanal anastomosis, includes loop ileostomy, and rectal mucosectomy, when performed
Surgery	44158	Procedure	CPT-4	Colectomy, total, abdominal, with proctectomy; with ileoanal anastomosis, creation of ileal reservoir (S or J), includes loop ileostomy, and rectal mucosectomy, when performed
Surgery	44160	Procedure	CPT-4	Colectomy, partial, with removal of terminal ileum with ileocolostomy
Surgery	44602	Procedure	CPT-4	Suture of small intestine (enterorrhaphy) for perforated ulcer, diverticulum, wound, injury or rupture; single perforation
Surgery	44603	Procedure	CPT-4	Suture of small intestine (enterorrhaphy) for perforated ulcer, diverticulum, wound, injury or rupture; multiple perforations
Surgery	44604	Procedure	CPT-4	Suture of large intestine (colorrhaphy) for perforated ulcer, diverticulum, wound, injury or rupture (single or multiple perforations); without colostomy
Surgery	44605	Procedure	CPT-4	Suture of large intestine (colorrhaphy) for perforated ulcer, diverticulum, wound, injury or rupture (single or multiple perforations); with colostomy
Surgery	44610	Procedure	CPT-4	SUTURE INTEST, LRG/SM-PERFOR.ULCER,ETC; MULTIPLE
Surgery	44615	Procedure	CPT-4	Intestinal stricturoplasty (enterotomy and enterorrhaphy) with or without dilation, for intestinal obstruction
Surgery	44620	Procedure	CPT-4	Closure of enterostomy, large or small intestine;
Surgery	44625	Procedure	CPT-4	Closure of enterostomy, large or small intestine; with resection and anastomosis other than colorectal
Surgery	44626	Procedure	CPT-4	Closure of enterostomy, large or small intestine; with resection and colorectal anastomosis (eg, closure of Hartmann type procedure)
Surgery	44640	Procedure	CPT-4	Closure of intestinal cutaneous fistula
Surgery	44650	Procedure	CPT-4	Closure of enteroenteric or enterocolic fistula
Surgery	44660	Procedure	CPT-4	Closure of enterovesical fistula; without intestinal or bladder resection
Surgery	44661	Procedure	CPT-4	Closure of enterovesical fistula; with intestine and/or bladder resection
Surgery	44680	Procedure	CPT-4	Intestinal plication (separate procedure)
Surgery	45.51	Procedure	ICD-9-CM	Isolation of segment of small intestine
Surgery	45.6	Procedure	ICD-9-CM	Other excision of small intestine
Surgery	45.7	Procedure	ICD-9-CM	Open and other partial excision of large intestine
Surgery	45.8	Procedure	ICD-9-CM	Total intra-abdominal colectomy
Surgery	45.9	Procedure	ICD-9-CM	Intestinal anastomosis
Surgery	45.90	Procedure	ICD-9-CM	Intestinal anastomosis, not otherwise specified
Surgery	45.91	Procedure	ICD-9-CM	Small-to-small intestinal anastomosis
Surgery	45.92	Procedure	ICD-9-CM	Anastomosis of small intestine to rectal stump
Surgery	45.93	Procedure	ICD-9-CM	Other small-to-large intestinal anastomosis
Surgery	45.94	Procedure	ICD-9-CM	Large-to-large intestinal anastomosis
Surgery	45.95	Procedure	ICD-9-CM	Anastomosis to anus
Surgery	45000	Procedure	CPT-4	Transrectal drainage of pelvic abscess
Surgery	45005	Procedure	CPT-4	Incision and drainage of submucosal abscess, rectum
Surgery	45020	Procedure	CPT-4	Incision and drainage of deep supralevator, pelvirectal, or retrorectal abscess
Surgery	45100	Procedure	CPT-4	Biopsy of anorectal wall, anal approach (eg, congenital megacolon)
Surgery	45105	Procedure	CPT-4	Biopsy Of Anorectal Wall, Anal Approach
Surgery	45108	Procedure	CPT-4	Anorectal myomectomy
Surgery	45110	Procedure	CPT-4	Proctectomy; complete, combined abdominoperineal, with colostomy

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	45111	Procedure	CPT-4	Proctectomy; partial resection of rectum, transabdominal approach
Surgery	45112	Procedure	CPT-4	Proctectomy, combined abdominoperineal, pull-through procedure (eg, colo-anal anastomosis)
Surgery	45113	Procedure	CPT-4	Proctectomy, partial, with rectal mucosectomy, ileoanal anastomosis, creation of ileal reservoir (S or J), with or without loop ileostomy
Surgery	45114	Procedure	CPT-4	Proctectomy, partial, with anastomosis; abdominal and transsacral approach
Surgery	45116	Procedure	CPT-4	Proctectomy, partial, with anastomosis; transsacral approach only (Kraske type)
Surgery	45119	Procedure	CPT-4	Proctectomy, combined abdominoperineal pull-through procedure (eg, colo-anal anastomosis), with creation of colonic reservoir (eg, J-pouch), with diverting enterostomy when performed
Surgery	45120	Procedure	CPT-4	Proctectomy, complete (for congenital megacolon), abdominal and perineal approach; with pull-through procedure and anastomosis (eg, Swenson, Duhamel, or Soave type operation)
Surgery	45121	Procedure	CPT-4	Proctectomy, complete (for congenital megacolon), abdominal and perineal approach; with subtotal or total colectomy, with multiple biopsies
Surgery	45123	Procedure	CPT-4	Proctectomy, partial, without anastomosis, perineal approach
Surgery	45126	Procedure	CPT-4	Pelvic exenteration for colorectal malignancy, with proctectomy (with or without colostomy), with removal of bladder and ureteral transplantations, and/or hysterectomy, or cervicectomy, with or without removal of tube(s), with or without removal of ovarv
Surgery	45130	Procedure	CPT-4	Excision of rectal procidentia, with anastomosis; perineal approach
Surgery	45135	Procedure	CPT-4	Excision of rectal procidentia, with anastomosis; abdominal and perineal approach
Surgery	45136	Procedure	CPT-4	Excision of ileoanal reservoir with ileostomy
Surgery	45150	Procedure	CPT-4	Division of stricture of rectum
Surgery	45160	Procedure	CPT-4	Excision of rectal tumor by proctotomy, transsacral or transcoccygeal approach
Surgery	45170	Procedure	CPT-4	Excision of rectal tumor, transanal approach
Surgery	45171	Procedure	CPT-4	Excision of rectal tumor, transanal approach; not including muscularis propria (ie, partial thickness)
Surgery	45172	Procedure	CPT-4	Excision of rectal tumor, transanal approach; including muscularis propria (ie, full thickness)
Surgery	45180	Procedure	CPT-4	EXC &/OR ELECTRODESICCATION MALIG TUMOR RECTUM
Surgery	45181	Procedure	CPT-4	Excision And/or Electrodesiccation Of Malignant Tumor Of
Surgery	45190	Procedure	CPT-4	Destruction of rectal tumor (eg, electrodesiccation, electrosurgery, laser ablation, laser resection, cryosurgery) transanal approach
Surgery	46.7	Procedure	ICD-9-CM	Other repair of intestine
Surgery	46.71	Procedure	ICD-9-CM	Suture of laceration of duodenum
Surgery	46.72	Procedure	ICD-9-CM	Closure of fistula of duodenum
Surgery	46.73	Procedure	ICD-9-CM	Suture of laceration of small intestine, except duodenum
Surgery	46.74	Procedure	ICD-9-CM	Closure of fistula of small intestine, except duodenum
Surgery	46.75	Procedure	ICD-9-CM	Suture of laceration of large intestine
Surgery	46.76	Procedure	ICD-9-CM	Closure of fistula of large intestine
Surgery	46.79	Procedure	ICD-9-CM	Other repair of intestine
Surgery	46270	Procedure	CPT-4	Surgical treatment of anal fistula (fistulectomy/fistulotomy); subcutaneous
Surgery	46275	Procedure	CPT-4	Surgical treatment of anal fistula (fistulectomy/fistulotomy); intersphincteric
Surgery	46280	Procedure	CPT-4	Surgical treatment of anal fistula (fistulectomy/fistulotomy); transsphincteric, suprasphincteric, extrasphincteric or multiple, including placement of seton, when performed
Surgery	46281	Procedure	CPT-4	CLO ANAL FISTULA W/RECTAL ADVANCEMENT FLAP
Surgery	46285	Procedure	CPT-4	Surgical treatment of anal fistula (fistulectomy/fistulotomy); second stage
Surgery	46288	Procedure	CPT-4	Closure of anal fistula with rectal advancement flap
Surgery	46320	Procedure	CPT-4	Excision of thrombosed hemorrhoid, external
Surgery	46700	Procedure	CPT-4	Anoplasty, plastic operation for stricture; adult
Surgery	46705	Procedure	CPT-4	Anoplasty, plastic operation for stricture; infant
Surgery	46706	Procedure	CPT-4	Repair of anal fistula with fibrin glue
Surgery	46707	Procedure	CPT-4	Repair of anorectal fistula with plug (eg, porcine small intestine submucosa [SIS])

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	46710	Procedure	CPT-4	Repair of ileoanal pouch fistula/sinus (eg, perineal or vaginal), pouch advancement; transperineal approach
Surgery	46712	Procedure	CPT-4	Repair of ileoanal pouch fistula/sinus (eg, perineal or vaginal), pouch advancement; combined transperineal and transabdominal approach
Surgery	46715	Procedure	CPT-4	Repair of low imperforate anus; with anoperineal fistula (cut-back procedure)
Surgery	46716	Procedure	CPT-4	Repair of low imperforate anus; with transposition of anoperineal or anovestibular fistula
Surgery	46730	Procedure	CPT-4	Repair of high imperforate anus without fistula; perineal or sacroperineal approach
Surgery	46735	Procedure	CPT-4	Repair of high imperforate anus without fistula; combined transabdominal and sacroperineal approaches
Surgery	46740	Procedure	CPT-4	Repair of high imperforate anus with rectourethral or rectovaginal fistula; perineal or sacroperineal approach
Surgery	46742	Procedure	CPT-4	Repair of high imperforate anus with rectourethral or rectovaginal fistula; combined transabdominal and sacroperineal approaches
Surgery	46744	Procedure	CPT-4	Repair of cloacal anomaly by anorectovaginoplasty and urethroplasty, sacroperineal approach
Surgery	46746	Procedure	CPT-4	Repair of cloacal anomaly by anorectovaginoplasty and urethroplasty, combined abdominal and sacroperineal approach;
Surgery	46748	Procedure	CPT-4	Repair of cloacal anomaly by anorectovaginoplasty and urethroplasty, combined abdominal and sacroperineal approach; with vaginal lengthening by intestinal graft or pedicle flaps
Surgery	46750	Procedure	CPT-4	Sphincteroplasty, anal, for incontinence or prolapse; adult
Surgery	46751	Procedure	CPT-4	Sphincteroplasty, anal, for incontinence or prolapse; child
Surgery	46753	Procedure	CPT-4	Graft (Thiersch operation) for rectal incontinence and/or prolapse
Surgery	46754	Procedure	CPT-4	Removal of Thiersch wire or suture, anal canal
Surgery	46760	Procedure	CPT-4	Sphincteroplasty, anal, for incontinence, adult; muscle transplant
Surgery	46761	Procedure	CPT-4	Sphincteroplasty, anal, for incontinence, adult; levator muscle imbrication (Park posterior anal repair)
Surgery	46762	Procedure	CPT-4	Sphincteroplasty, anal, for incontinence, adult; implantation artificial sphincter
Surgery	46900	Procedure	CPT-4	Destruction of lesion(s), anus (eg, condyloma, papilloma, molluscum contagiosum, herpetic vesicle), simple; chemical
Surgery	46910	Procedure	CPT-4	Destruction of lesion(s), anus (eg, condyloma, papilloma, molluscum contagiosum, herpetic vesicle), simple; electrodesiccation
Surgery	46916	Procedure	CPT-4	Destruction of lesion(s), anus (eg, condyloma, papilloma, molluscum contagiosum, herpetic vesicle), simple; cryosurgery
Surgery	46917	Procedure	CPT-4	Destruction of lesion(s), anus (eg, condyloma, papilloma, molluscum contagiosum, herpetic vesicle), simple; laser surgery
Surgery	46922	Procedure	CPT-4	Destruction of lesion(s), anus (eg, condyloma, papilloma, molluscum contagiosum, herpetic vesicle), simple; surgical excision
Surgery	46924	Procedure	CPT-4	Destruction of lesion(s), anus (eg, condyloma, papilloma, molluscum contagiosum, herpetic vesicle), extensive (eg, laser surgery, electrosurgery, cryosurgery, chemosurgery)
Surgery	46930	Procedure	CPT-4	Destruction of internal hemorrhoid(s) by thermal energy (eg, infrared coagulation, cautery, radiofrequency)
Surgery	46934	Procedure	CPT-4	Destruction of hemorrhoids, any method; internal
Surgery	46935	Procedure	CPT-4	Destruction of hemorrhoids, any method; external
Surgery	46936	Procedure	CPT-4	Destruction of hemorrhoids, any method; internal and external
Surgery	46937	Procedure	CPT-4	Cryosurgery of rectal tumor; benign
Surgery	46938	Procedure	CPT-4	Cryosurgery of rectal tumor; malignant
Surgery	46940	Procedure	CPT-4	Curettage or cautery of anal fissure, including dilation of anal sphincter (separate procedure); initial
Surgery	46942	Procedure	CPT-4	Curettage or cautery of anal fissure, including dilation of anal sphincter (separate procedure); subsequent
Surgery	46945	Procedure	CPT-4	Hemorrhoidectomy, internal, by ligation other than rubber band; single hemorrhoid column/group
Surgery	46946	Procedure	CPT-4	Hemorrhoidectomy, internal, by ligation other than rubber band; 2 or more hemorrhoid columns/groups
Surgery	46947	Procedure	CPT-4	Hemorrhoidopexy (eg, for prolapsing internal hemorrhoids) by stapling
Surgery	47120	Procedure	CPT-4	Hepatectomy, resection of liver; partial lobectomy
Surgery	47122	Procedure	CPT-4	Hepatectomy, resection of liver; trisegmentectomy
Surgery	47125	Procedure	CPT-4	Hepatectomy, resection of liver; total left lobectomy

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	47130	Procedure	CPT-4	Hepatectomy, resection of liver; total right lobectomy
Surgery	47300	Procedure	CPT-4	Marsupialization of cyst or abscess of liver
Surgery	47350	Procedure	CPT-4	Management of liver hemorrhage; simple suture of liver wound or injury
Surgery	47355	Procedure	CPT-4	HEPATORRHAPHY; W/COMMON DUCT/GB DRAINAGE
Surgery	47360	Procedure	CPT-4	Management of liver hemorrhage; complex suture of liver wound or injury, with or without hepatic artery ligation
Surgery	47361	Procedure	CPT-4	Management of liver hemorrhage; exploration of hepatic wound, extensive debridement, coagulation and/or suture, with or without packing of liver
Surgery	47362	Procedure	CPT-4	Management of liver hemorrhage; re-exploration of hepatic wound for removal of packing
Surgery	48.4	Procedure	ICD-9-CM	Pull-through resection of rectum
Surgery	48.5	Procedure	ICD-9-CM	Abdominoperineal resection of rectum
Surgery	48.6	Procedure	ICD-9-CM	Other resection of rectum
Surgery	48.7	Procedure	ICD-9-CM	Repair of rectum
Surgery	48.8	Procedure	ICD-9-CM	Incision or excision of perirectal tissue or lesion
Surgery	48.9	Procedure	ICD-9-CM	Other operations on rectum and perirectal tissue
Surgery	48.91	Procedure	ICD-9-CM	Incision of rectal stricture
Surgery	48.92	Procedure	ICD-9-CM	Anorectal myectomy
Surgery	48.93	Procedure	ICD-9-CM	Repair of perirectal fistula
Surgery	48.99	Procedure	ICD-9-CM	Other operations on rectum and perirectal tissue
Surgery	48000	Procedure	CPT-4	Placement of drains, peripancreatic, for acute pancreatitis;
Surgery	48001	Procedure	CPT-4	Placement of drains, peripancreatic, for acute pancreatitis; with cholecystostomy, gastrostomy, and jejunostomy
Surgery	48005	Procedure	CPT-4	Resection or debridement of pancreas and peripancreatic tissue for acute necrotizing pancreatitis
Surgery	48020	Procedure	CPT-4	Removal of pancreatic calculus
Surgery	48100	Procedure	CPT-4	Biopsy of pancreas, open (eg, fine needle aspiration, needle core biopsy, wedge biopsy)
Surgery	48102	Procedure	CPT-4	Biopsy of pancreas, percutaneous needle
Surgery	48105	Procedure	CPT-4	Resection or debridement of pancreas and peripancreatic tissue for acute necrotizing pancreatitis
Surgery	48120	Procedure	CPT-4	Excision of lesion of pancreas (eg, cyst, adenoma)
Surgery	48140	Procedure	CPT-4	Pancreatectomy, distal subtotal, with or without splenectomy; without pancreaticojejunostomy
Surgery	48145	Procedure	CPT-4	Pancreatectomy, distal subtotal, with or without splenectomy; with pancreaticojejunostomy
Surgery	48146	Procedure	CPT-4	Pancreatectomy, distal, near-total with preservation of duodenum (Child-type procedure)
Surgery	48148	Procedure	CPT-4	Excision of ampulla of Vater
Surgery	48150	Procedure	CPT-4	Pancreatectomy, proximal subtotal with total duodenectomy, partial gastrectomy, choledochoenterostomy and gastrojejunostomy (Whipple-type procedure); with pancreaticojejunostomy
Surgery	48151	Procedure	CPT-4	PANCREATECTOMY NEAR-TOTAL,PRESERVATION DUODENUM
Surgery	48152	Procedure	CPT-4	Pancreatectomy, proximal subtotal with total duodenectomy, partial gastrectomy, choledochoenterostomy and gastrojejunostomy (Whipple-type procedure); without pancreaticojejunostomy
Surgery	48153	Procedure	CPT-4	Pancreatectomy, proximal subtotal with near-total duodenectomy, choledochoenterostomy and duodenojejunostomy (pylorus-sparing, Whipple-type procedure); with pancreaticojejunostomy
Surgery	48154	Procedure	CPT-4	Pancreatectomy, proximal subtotal with near-total duodenectomy, choledochoenterostomy and duodenojejunostomy (pylorus-sparing, Whipple-type procedure); without pancreaticojejunostomy
Surgery	48155	Procedure	CPT-4	Pancreatectomy, total
Surgery	48160	Procedure	CPT-4	Pancreatectomy, total or subtotal, with autologous transplantation of pancreas or pancreatic islet cells
Surgery	48180	Procedure	CPT-4	Pancreaticojejunostomy, side-to-side anastomosis (Puestow-type operation)
Surgery	48400	Procedure	CPT-4	Injection procedure for intraoperative pancreatography (List separately in addition to code for primary procedure)
Surgery	48500	Procedure	CPT-4	Marsupialization of pancreatic cyst
Surgery	48510	Procedure	CPT-4	External drainage, pseudocyst of pancreas, open
Surgery	48511	Procedure	CPT-4	External drainage, pseudocyst of pancreas; percutaneous
Surgery	48520	Procedure	CPT-4	Internal anastomosis of pancreatic cyst to gastrointestinal tract; direct
Surgery	48540	Procedure	CPT-4	Internal anastomosis of pancreatic cyst to gastrointestinal tract; Roux-en-Y

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	48545	Procedure	CPT-4	Pancreatorrhaphy for injury
Surgery	48547	Procedure	CPT-4	Duodenal exclusion with gastrojejunostomy for pancreatic injury
Surgery	48548	Procedure	CPT-4	Pancreaticojejunostomy, side-to-side anastomosis (Puestow-type operation)
Surgery	49000	Procedure	CPT-4	Exploratory laparotomy, exploratory celiotomy with or without biopsy(s) (separate procedure)
Surgery	49002	Procedure	CPT-4	Reopening of recent laparotomy
Surgery	49010	Procedure	CPT-4	Exploration, retroperitoneal area with or without biopsy(s) (separate procedure)
Surgery	49020	Procedure	CPT-4	Drainage of peritoneal abscess or localized peritonitis, exclusive of appendiceal abscess, open
Surgery	49021	Procedure	CPT-4	Drainage of peritoneal abscess or localized peritonitis, exclusive of appendiceal abscess; percutaneous
Surgery	49040	Procedure	CPT-4	Drainage of subdiaphragmatic or subphrenic abscess, open
Surgery	49041	Procedure	CPT-4	Drainage of subdiaphragmatic or subphrenic abscess; percutaneous
Surgery	49060	Procedure	CPT-4	Drainage of retroperitoneal abscess, open
Surgery	49061	Procedure	CPT-4	Drainage of retroperitoneal abscess; percutaneous
Surgery	49062	Procedure	CPT-4	Drainage of extraperitoneal lymphocele to peritoneal cavity, open
Surgery	49080	Procedure	CPT-4	Peritoneocentesis, abdominal paracentesis, or peritoneal lavage (diagnostic or therapeutic); initial
Surgery	49081	Procedure	CPT-4	Peritoneocentesis, abdominal paracentesis, or peritoneal lavage (diagnostic or therapeutic); subsequent
Surgery	49215	Procedure	CPT-4	Excision of presacral or sacrococcygeal tumor
Surgery	49900	Procedure	CPT-4	Suture, secondary, of abdominal wall for evisceration or dehiscence
Surgery	50.22	Procedure	ICD-9-CM	Partial hepatectomy
Surgery	50.3	Procedure	ICD-9-CM	Lobectomy of liver
Surgery	50.4	Procedure	ICD-9-CM	Total hepatectomy
Surgery	50.6	Procedure	ICD-9-CM	Repair of liver
Surgery	50.61	Procedure	ICD-9-CM	Closure of laceration of liver
Surgery	50.69	Procedure	ICD-9-CM	Other repair of liver
Surgery	50010	Procedure	CPT-4	Renal exploration, not necessitating other specific procedures
Surgery	50020	Procedure	CPT-4	Drainage of perirenal or renal abscess, open
Surgery	50021	Procedure	CPT-4	Drainage of perirenal or renal abscess; percutaneous
Surgery	50040	Procedure	CPT-4	Nephrostomy, nephrotomy with drainage
Surgery	50045	Procedure	CPT-4	Nephrotomy, with exploration
Surgery	50100	Procedure	CPT-4	Transection or repositioning of aberrant renal vessels (separate procedure)
Surgery	50120	Procedure	CPT-4	Pyelotomy; with exploration
Surgery	50125	Procedure	CPT-4	Pyelotomy; with drainage, pyelostomy
Surgery	50130	Procedure	CPT-4	Pyelotomy; with removal of calculus (pyelolithotomy, pelviolithotomy, including coagulum pyelolithotomy)
Surgery	50135	Procedure	CPT-4	Pyelotomy; complicated (eg, secondary operation, congenital kidney abnormality)
Surgery	50220	Procedure	CPT-4	Nephrectomy, including partial ureterectomy, any open approach including rib resection;
Surgery	50225	Procedure	CPT-4	Nephrectomy, including partial ureterectomy, any open approach including rib resection; complicated because of previous surgery on same kidney
Surgery	50230	Procedure	CPT-4	Nephrectomy, including partial ureterectomy, any open approach including rib resection; radical, with regional lymphadenectomy and/or vena caval thrombectomy
Surgery	50234	Procedure	CPT-4	Nephrectomy with total ureterectomy and bladder cuff; through same incision
Surgery	50236	Procedure	CPT-4	Nephrectomy with total ureterectomy and bladder cuff; through separate incision
Surgery	50240	Procedure	CPT-4	Nephrectomy, partial
Surgery	50400	Procedure	CPT-4	Pyeloplasty (Foley Y-pyeloplasty), plastic operation on renal pelvis, with or without plastic operation on ureter, nephropexy, nephrostomy, pyelostomy, or ureteral splinting; simple
Surgery	50405	Procedure	CPT-4	Pyeloplasty (Foley Y-pyeloplasty), plastic operation on renal pelvis, with or without plastic operation on ureter, nephropexy, nephrostomy, pyelostomy, or ureteral splinting; complicated (congenital kidney abnormality, secondary pyeloplasty, solitary kid

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	50430	Procedure	CPT-4	Injection procedure for antegrade nephrostogram and/or ureterogram, complete diagnostic procedure including imaging guidance (eg, ultrasound and fluoroscopy) and all associated radiological supervision and interpretation; new access
Surgery	50431	Procedure	CPT-4	Injection procedure for antegrade nephrostogram and/or ureterogram, complete diagnostic procedure including imaging guidance (eg, ultrasound and fluoroscopy) and all associated radiological supervision and interpretation; existing access
Surgery	50432	Procedure	CPT-4	Placement of nephrostomy catheter, percutaneous, including diagnostic nephrostogram and/or ureterogram when performed, imaging guidance (eg, ultrasound and/or fluoroscopy) and all associated radiological supervision and interpretation
Surgery	50433	Procedure	CPT-4	Placement of nephroureteral catheter, percutaneous, including diagnostic nephrostogram and/or ureterogram when performed, imaging guidance (eg, ultrasound and/or fluoroscopy) and all associated radiological supervision and interpretation, new access
Surgery	50434	Procedure	CPT-4	Convert nephrostomy catheter to nephroureteral catheter, percutaneous, including diagnostic nephrostogram and/or ureterogram when performed, imaging guidance (eg, ultrasound and/or fluoroscopy) and all associated radiological supervision and interpretation
Surgery	50435	Procedure	CPT-4	Exchange nephrostomy catheter, percutaneous, including diagnostic nephrostogram and/or ureterogram when performed, imaging guidance (eg, ultrasound and/or fluoroscopy) and all associated radiological supervision and interpretation
Surgery	50500	Procedure	CPT-4	Nephrorrhaphy, suture of kidney wound or injury
Surgery	50520	Procedure	CPT-4	Closure of nephrocutaneous or pyelocutaneous fistula
Surgery	50525	Procedure	CPT-4	Closure of nephrovisceral fistula (eg, renocolic), including visceral repair; abdominal approach
Surgery	50526	Procedure	CPT-4	Closure of nephrovisceral fistula (eg, renocolic), including visceral repair; thoracic approach
Surgery	50540	Procedure	CPT-4	Symphysiotomy for horseshoe kidney with or without pyeloplasty and/or other plastic procedure, unilateral or bilateral (1 operation)
Surgery	51800	Procedure	CPT-4	Cystoplasty or cystourethroplasty, plastic operation on bladder and/or vesical neck (anterior Y-plasty, vesical fundus resection), any procedure, with or without wedge resection of posterior vesical neck
Surgery	51820	Procedure	CPT-4	Cystourethroplasty with unilateral or bilateral ureteroneocystostomy
Surgery	51840	Procedure	CPT-4	Anterior vesicourethropexy, or urethropexy (eg, Marshall-Marchetti-Krantz, Burch); simple
Surgery	51841	Procedure	CPT-4	Anterior vesicourethropexy, or urethropexy (eg, Marshall-Marchetti-Krantz, Burch); complicated (eg, secondary repair)
Surgery	51845	Procedure	CPT-4	Abdomino-vaginal vesical neck suspension, with or without endoscopic control (eg, Stamey, Raz, modified Pereyra)
Surgery	51860	Procedure	CPT-4	Cystorrhaphy, suture of bladder wound, injury or rupture; simple
Surgery	51865	Procedure	CPT-4	Cystorrhaphy, suture of bladder wound, injury or rupture; complicated
Surgery	51880	Procedure	CPT-4	Closure of cystostomy (separate procedure)
Surgery	51900	Procedure	CPT-4	Closure of vesicovaginal fistula, abdominal approach
Surgery	51920	Procedure	CPT-4	Closure of vesicouterine fistula;
Surgery	51925	Procedure	CPT-4	Closure of vesicouterine fistula; with hysterectomy
Surgery	51940	Procedure	CPT-4	Closure, exstrophy of bladder
Surgery	51960	Procedure	CPT-4	Enterocystoplasty, including intestinal anastomosis
Surgery	51980	Procedure	CPT-4	Cutaneous vesicostomy
Surgery	54.11	Procedure	ICD-9-CM	Exploratory laparotomy
Surgery	55.4	Procedure	ICD-9-CM	Partial nephrectomy
Surgery	55.5	Procedure	ICD-9-CM	Complete nephrectomy
Surgery	55.51	Procedure	ICD-9-CM	Nephroureterectomy
Surgery	55.52	Procedure	ICD-9-CM	Nephrectomy of remaining kidney
Surgery	55.53	Procedure	ICD-9-CM	Removal of transplanted or rejected kidney
Surgery	55.54	Procedure	ICD-9-CM	Bilateral nephrectomy

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	58140	Procedure	CPT-4	Myomectomy, excision of fibroid tumor(s) of uterus, 1 to 4 intramural myoma(s) with total weight of 250 g or less and/or removal of surface myomas; abdominal approach
Surgery	58145	Procedure	CPT-4	Myomectomy, excision of fibroid tumor(s) of uterus, 1 to 4 intramural myoma(s) with total weight of 250 g or less and/or removal of surface myomas; vaginal approach
Surgery	58146	Procedure	CPT-4	Myomectomy, excision of fibroid tumor(s) of uterus, 5 or more intramural myomas and/or intramural myomas with total weight greater than 250 g, abdominal approach
Surgery	58700	Procedure	CPT-4	Salpingectomy, complete or partial, unilateral or bilateral (separate procedure)
Surgery	58720	Procedure	CPT-4	Salpingo-oophorectomy, complete or partial, unilateral or bilateral (separate procedure)
Surgery	58740	Procedure	CPT-4	Lysis of adhesions (salpingolysis, ovariolysis)
Surgery	58750	Procedure	CPT-4	Tubotubal anastomosis
Surgery	58752	Procedure	CPT-4	Tubouterine implantation
Surgery	58760	Procedure	CPT-4	Fimbrioplasty
Surgery	58770	Procedure	CPT-4	Salpingostomy (salpingoneostomy)
Surgery	58800	Procedure	CPT-4	Drainage of ovarian cyst(s), unilateral or bilateral (separate procedure); vaginal approach
Surgery	58805	Procedure	CPT-4	Drainage of ovarian cyst(s), unilateral or bilateral (separate procedure); abdominal approach
Surgery	58820	Procedure	CPT-4	Drainage of ovarian abscess; vaginal approach, open
Surgery	58822	Procedure	CPT-4	Drainage of ovarian abscess; abdominal approach
Surgery	58823	Procedure	CPT-4	Drainage of pelvic abscess, transvaginal or transrectal approach, percutaneous (eg, ovarian, pericolic)
Surgery	58825	Procedure	CPT-4	Transposition, ovary(s)
Surgery	58900	Procedure	CPT-4	Biopsy of ovary, unilateral or bilateral (separate procedure)
Surgery	58920	Procedure	CPT-4	Wedge resection or bisection of ovary, unilateral or bilateral
Surgery	58925	Procedure	CPT-4	Ovarian cystectomy, unilateral or bilateral
Surgery	58940	Procedure	CPT-4	Oophorectomy, partial or total, unilateral or bilateral;
Surgery	58942	Procedure	CPT-4	Oophorectomy, Partial Or Total, Unilateral Or Bilateral;
Surgery	58943	Procedure	CPT-4	Oophorectomy, partial or total, unilateral or bilateral; for ovarian, tubal or primary peritoneal malignancy, with para-aortic and pelvic lymph node biopsies, peritoneal washings, peritoneal biopsies, diaphragmatic assessments, with or without salpingecto
Surgery	58945	Procedure	CPT-4	Oophorectomy, Partial Or Total, Unilateral Or Bilateral;
Surgery	58950	Procedure	CPT-4	Resection (initial) of ovarian, tubal or primary peritoneal malignancy with bilateral salpingo-oophorectomy and omentectomy;
Surgery	58951	Procedure	CPT-4	Resection (initial) of ovarian, tubal or primary peritoneal malignancy with bilateral salpingo-oophorectomy and omentectomy; with total abdominal hysterectomy, pelvic and limited para-aortic lymphadenectomy
Surgery	58952	Procedure	CPT-4	Resection (initial) of ovarian, tubal or primary peritoneal malignancy with bilateral salpingo-oophorectomy and omentectomy; with radical dissection for debulking (ie, radical excision or destruction, intra-abdominal or retroperitoneal tumors)
Surgery	58953	Procedure	CPT-4	Bilateral salpingo-oophorectomy with omentectomy, total abdominal hysterectomy and radical dissection for debulking;
Surgery	58954	Procedure	CPT-4	Bilateral salpingo-oophorectomy with omentectomy, total abdominal hysterectomy and radical dissection for debulking; with pelvic lymphadenectomy and limited para-aortic lymphadenectomy
Surgery	58956	Procedure	CPT-4	Bilateral salpingo-oophorectomy with total omentectomy, total abdominal hysterectomy for malignancy
Surgery	58957	Procedure	CPT-4	Resection (tumor debulking) of recurrent ovarian, tubal, primary peritoneal, uterine malignancy (intra-abdominal, retroperitoneal tumors), with omentectomy, if performed;
Surgery	58958	Procedure	CPT-4	Resection (tumor debulking) of recurrent ovarian, tubal, primary peritoneal, uterine malignancy (intra-abdominal, retroperitoneal tumors), with omentectomy, if performed; with pelvic lymphadenectomy and limited para-aortic lymphadenectomy
Surgery	58960	Procedure	CPT-4	Laparotomy, for staging or restaging of ovarian, tubal, or primary peritoneal malignancy (second look), with or without omentectomy, peritoneal washing, biopsy of abdominal and pelvic peritoneum, diaphragmatic assessment with pelvic and limited para-aorti

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	59100	Procedure	CPT-4	Hysterotomy, abdominal (eg, for hydatidiform mole, abortion)
Surgery	59101	Procedure	CPT-4	Hysterotomy, Abdominal, For Removal Of Hydatidiform Mole
Surgery	59105	Procedure	CPT-4	Hysterotomy, Abdominal, For Legal Abortion
Surgery	59106	Procedure	CPT-4	Hysterotomy, Abdominal, For Legal Abortion
Surgery	59120	Procedure	CPT-4	Surgical treatment of ectopic pregnancy; tubal or ovarian, requiring salpingectomy and/or oophorectomy, abdominal or vaginal approach
Surgery	59121	Procedure	CPT-4	Surgical treatment of ectopic pregnancy; tubal or ovarian, without salpingectomy and/or oophorectomy
Surgery	59125	Procedure	CPT-4	Surgical Treatment Of Ectopic Pregnancy
Surgery	59126	Procedure	CPT-4	Surgical Treatment Of Ectopic Pregnancy
Surgery	59130	Procedure	CPT-4	Surgical treatment of ectopic pregnancy; abdominal pregnancy
Surgery	59135	Procedure	CPT-4	Surgical treatment of ectopic pregnancy; interstitial, uterine pregnancy requiring total hysterectomy
Surgery	59136	Procedure	CPT-4	Surgical treatment of ectopic pregnancy; interstitial, uterine pregnancy with partial resection of uterus
Surgery	59140	Procedure	CPT-4	Surgical treatment of ectopic pregnancy; cervical, with evacuation
Surgery	61304	Procedure	CPT-4	Craniectomy or craniotomy, exploratory; supratentorial
Surgery	61305	Procedure	CPT-4	Craniectomy or craniotomy, exploratory; infratentorial (posterior fossa)
Surgery	61310	Procedure	CPT-4	Craniectomy Or Craniotomy, Evacuation Of Hematoma,
Surgery	61311	Procedure	CPT-4	Craniectomy Or Craniotomy, Evacuation Of Hematoma,
Surgery	61312	Procedure	CPT-4	Craniectomy or craniotomy for evacuation of hematoma, supratentorial; extradural or subdural
Surgery	61313	Procedure	CPT-4	Craniectomy or craniotomy for evacuation of hematoma, supratentorial; intracerebral
Surgery	61314	Procedure	CPT-4	Craniectomy or craniotomy for evacuation of hematoma, infratentorial; extradural or subdural
Surgery	61315	Procedure	CPT-4	Craniectomy or craniotomy for evacuation of hematoma, infratentorial; intracerebellar
Surgery	61316	Procedure	CPT-4	Incision and subcutaneous placement of cranial bone graft (List separately in addition to code for primary procedure)
Surgery	61320	Procedure	CPT-4	Craniectomy or craniotomy, drainage of intracranial abscess; supratentorial
Surgery	61321	Procedure	CPT-4	Craniectomy or craniotomy, drainage of intracranial abscess; infratentorial
Surgery	61322	Procedure	CPT-4	Craniectomy or craniotomy, decompressive, with or without duraplasty, for treatment of intracranial hypertension, without evacuation of associated intraparenchymal hematoma; without lobectomy
Surgery	61323	Procedure	CPT-4	Craniectomy or craniotomy, decompressive, with or without duraplasty, for treatment of intracranial hypertension, without evacuation of associated intraparenchymal hematoma; with lobectomy
Surgery	61340	Procedure	CPT-4	Subtemporal cranial decompression (pseudotumor cerebri, slit ventricle syndrome)
Surgery	61341	Procedure	CPT-4	Other Cranial Decompression (eg, Subtemporal),
Surgery	61343	Procedure	CPT-4	Craniectomy, suboccipital with cervical laminectomy for decompression of medulla and spinal cord, with or without dural graft (eg, Arnold-Chiari malformation)
Surgery	61345	Procedure	CPT-4	Other cranial decompression, posterior fossa
Surgery	61440	Procedure	CPT-4	Craniotomy for section of tentorium cerebelli (separate procedure)
Surgery	61450	Procedure	CPT-4	Craniectomy, subtemporal, for section, compression, or decompression of sensory root of gasserian ganglion
Surgery	61458	Procedure	CPT-4	Craniectomy, suboccipital; for exploration or decompression of cranial nerves
Surgery	61460	Procedure	CPT-4	Craniectomy, suboccipital; for section of 1 or more cranial nerves
Surgery	61470	Procedure	CPT-4	Craniectomy, suboccipital; for medullary tractotomy
Surgery	61480	Procedure	CPT-4	Craniectomy, suboccipital; for mesencephalic tractotomy or pedunculotomy
Surgery	61490	Procedure	CPT-4	Craniotomy for lobotomy, including cingulotomy
Surgery	61491	Procedure	CPT-4	Craniotomy For Lobotomy, Including Cingulotomy
Surgery	61500	Procedure	CPT-4	Craniectomy; with excision of tumor or other bone lesion of skull
Surgery	61501	Procedure	CPT-4	Craniectomy; for osteomyelitis
Surgery	61510	Procedure	CPT-4	Craniectomy, trephination, bone flap craniotomy; for excision of brain tumor, supratentorial, except meningioma
Surgery	61512	Procedure	CPT-4	Craniectomy, trephination, bone flap craniotomy; for excision of meningioma, supratentorial
Surgery	61514	Procedure	CPT-4	Craniectomy, trephination, bone flap craniotomy; for excision of brain abscess, supratentorial
Surgery	61516	Procedure	CPT-4	Craniectomy, trephination, bone flap craniotomy; for excision or fenestration of cyst, supratentorial

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	61517	Procedure	CPT-4	Implantation of brain intracavitary chemotherapy agent (List separately in addition to code for primary procedure)
Surgery	61518	Procedure	CPT-4	Craniectomy for excision of brain tumor, infratentorial or posterior fossa; except meningioma, cerebellopontine angle tumor, or midline tumor at base of skull
Surgery	61519	Procedure	CPT-4	Craniectomy for excision of brain tumor, infratentorial or posterior fossa; meningioma
Surgery	61520	Procedure	CPT-4	Craniectomy for excision of brain tumor, infratentorial or posterior fossa; cerebellopontine angle tumor
Surgery	61521	Procedure	CPT-4	Craniectomy for excision of brain tumor, infratentorial or posterior fossa; midline tumor at base of skull
Surgery	61522	Procedure	CPT-4	Craniectomy, infratentorial or posterior fossa; for excision of brain abscess
Surgery	61524	Procedure	CPT-4	Craniectomy, infratentorial or posterior fossa; for excision or fenestration of cyst
Surgery	61526	Procedure	CPT-4	Craniectomy, bone flap craniotomy, transtemporal (mastoid) for excision of cerebellopontine angle tumor;
Surgery	61530	Procedure	CPT-4	Craniectomy, bone flap craniotomy, transtemporal (mastoid) for excision of cerebellopontine angle tumor; combined with middle/posterior fossa craniotomy/craniectomy
Surgery	61537	Procedure	CPT-4	Craniotomy with elevation of bone flap; for lobectomy, temporal lobe, without electrocorticography during surgery
Surgery	61538	Procedure	CPT-4	Craniotomy with elevation of bone flap; for lobectomy, temporal lobe, with electrocorticography during surgery
Surgery	61539	Procedure	CPT-4	Craniotomy with elevation of bone flap; for lobectomy, other than temporal lobe, partial or total, with electrocorticography during surgery
Surgery	61540	Procedure	CPT-4	Craniotomy with elevation of bone flap; for lobectomy, other than temporal lobe, partial or total, without electrocorticography during surgery
Surgery	61541	Procedure	CPT-4	Craniotomy with elevation of bone flap; for transection of corpus callosum
Surgery	61542	Procedure	CPT-4	Craniotomy with elevation of bone flap; for total hemispherectomy
Surgery	61543	Procedure	CPT-4	Craniotomy with elevation of bone flap; for partial or subtotal (functional) hemispherectomy
Surgery	61546	Procedure	CPT-4	Craniotomy for hypophysectomy or excision of pituitary tumor, intracranial approach
Surgery	61566	Procedure	CPT-4	Craniotomy with elevation of bone flap; for selective amygdalohippocampectomy
Surgery	61567	Procedure	CPT-4	Craniotomy with elevation of bone flap; for multiple subpial transections, with electrocorticography during surgery
Surgery	61570	Procedure	CPT-4	Craniectomy or craniotomy; with excision of foreign body from brain
Surgery	61571	Procedure	CPT-4	Craniectomy or craniotomy; with treatment of penetrating wound of brain
Surgery	61680	Procedure	CPT-4	Surgery of intracranial arteriovenous malformation; supratentorial, simple
Surgery	61682	Procedure	CPT-4	Surgery of intracranial arteriovenous malformation; supratentorial, complex
Surgery	61684	Procedure	CPT-4	Surgery of intracranial arteriovenous malformation; infratentorial, simple
Surgery	61686	Procedure	CPT-4	Surgery of intracranial arteriovenous malformation; infratentorial, complex
Surgery	61690	Procedure	CPT-4	Surgery of intracranial arteriovenous malformation; dural, simple
Surgery	61692	Procedure	CPT-4	Surgery of intracranial arteriovenous malformation; dural, complex
Surgery	61697	Procedure	CPT-4	Surgery of complex intracranial aneurysm, intracranial approach; carotid circulation
Surgery	61700	Procedure	CPT-4	Surgery of simple intracranial aneurysm, intracranial approach; carotid circulation
Surgery	61705	Procedure	CPT-4	Surgery of aneurysm, vascular malformation or carotid-cavernous fistula; by intracranial and cervical occlusion of carotid artery
Surgery	63081	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, anterior approach with decompression of spinal cord and/or nerve root(s); cervical, single segment
Surgery	63082	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, anterior approach with decompression of spinal cord and/or nerve root(s); cervical, each additional segment (List separately in addition to code for primary procedure)
Surgery	63085	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, transthoracic approach with decompression of spinal cord and/or nerve root(s); thoracic, single segment
Surgery	63086	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, transthoracic approach with decompression of spinal cord and/or nerve root(s); thoracic, each additional segment (List separately in addition to code for primary procedure)
Surgery	63087	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, combined thoracolumbar approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic or lumbar; single segment

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	63088	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, combined thoracolumbar approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic or lumbar; each additional segment (List separately in addition to code
Surgery	63090	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, transperitoneal or retroperitoneal approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic, lumbar, or sacral; single segment
Surgery	63091	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, transperitoneal or retroperitoneal approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic, lumbar, or sacral; each additional segment (List separately
Surgery	63101	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, lateral extracavitary approach with decompression of spinal cord and/or nerve root(s) (eg, for tumor or retracted bone fragments); thoracic, single segment
Surgery	63102	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, lateral extracavitary approach with decompression of spinal cord and/or nerve root(s) (eg, for tumor or retracted bone fragments); lumbar, single segment
Surgery	63103	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, lateral extracavitary approach with decompression of spinal cord and/or nerve root(s) (eg, for tumor or retracted bone fragments); thoracic or lumbar, each additional segment (List
Surgery	63300	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, cervical
Surgery	63301	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, thoracic by transthoracic approach
Surgery	63302	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, thoracic by thoracolumbar approach
Surgery	63303	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, lumbar or sacral by transperitoneal or retroperitoneal approach
Surgery	63304	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, cervical
Surgery	63305	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, thoracic by transthoracic approach
Surgery	63306	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, thoracic by thoracolumbar approach
Surgery	63307	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, lumbar or sacral by transperitoneal or retroperitoneal approach
Surgery	63308	Procedure	CPT-4	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; each additional segment (List separately in addition to codes for single segment)
Surgery	78.15	Procedure	ICD-9-CM	Application of external fixator device, femur
Surgery	78.17	Procedure	ICD-9-CM	Application of external fixator device, tibia and fibula
Surgery	78.55	Procedure	ICD-9-CM	Internal fixation of femur without fracture reduction
Surgery	78.57	Procedure	ICD-9-CM	Internal fixation of tibia and fibula without fracture reduction
Surgery	79.15	Procedure	ICD-9-CM	Closed reduction of fracture of femur with internal fixation
Surgery	79.16	Procedure	ICD-9-CM	Closed reduction of fracture of tibia and fibula with internal fixation
Surgery	79.26	Procedure	ICD-9-CM	Open reduction of fracture of tibia and fibula without internal fixation
Surgery	79.35	Procedure	ICD-9-CM	Open reduction of fracture of femur with internal fixation
Surgery	79.36	Procedure	ICD-9-CM	Open reduction of fracture of tibia and fibula with internal fixation
Surgery	79.5	Procedure	ICD-9-CM	Open reduction of separated epiphysis
Surgery	79.85	Procedure	ICD-9-CM	Open reduction of dislocation of hip
Surgery	79.86	Procedure	ICD-9-CM	Open reduction of dislocation of knee
Surgery	81.0	Procedure	ICD-9-CM	Spinal fusion

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Surgery	81.00	Procedure	ICD-9-CM	Spinal fusion, not otherwise specified
Surgery	81.01	Procedure	ICD-9-CM	Atlas-axis spinal fusion
Surgery	81.02	Procedure	ICD-9-CM	Other cervical fusion of the anterior column, anterior technique
Surgery	81.03	Procedure	ICD-9-CM	Other cervical fusion of the posterior column, posterior technique
Surgery	81.04	Procedure	ICD-9-CM	Dorsal and dorsolumbar fusion of the anterior column, anterior technique
Surgery	81.05	Procedure	ICD-9-CM	Dorsal and dorsolumbar fusion of the posterior column, posterior technique
Surgery	81.06	Procedure	ICD-9-CM	Lumbar and lumbosacral fusion of the anterior column, anterior technique
Surgery	81.07	Procedure	ICD-9-CM	Lumbar and lumbosacral fusion of the posterior column, posterior technique
Surgery	81.08	Procedure	ICD-9-CM	Lumbar and lumbosacral fusion of the anterior column, posterior technique
Surgery	81.09	Procedure	ICD-9-CM	Refusion of spine, any level or technique
Surgery	81.5	Procedure	ICD-9-CM	Joint replacement of lower extremity
Surgery	81.51	Procedure	ICD-9-CM	Total hip replacement
Surgery	81.52	Procedure	ICD-9-CM	Partial hip replacement
Surgery	81.53	Procedure	ICD-9-CM	Revision of hip replacement, not otherwise specified
Surgery	81.54	Procedure	ICD-9-CM	Total knee replacement
Surgery	81.55	Procedure	ICD-9-CM	Revision of knee replacement, not otherwise specified
Surgery	81.56	Procedure	ICD-9-CM	Total ankle replacement
Surgery	81.57	Procedure	ICD-9-CM	Replacement of joint of foot and toe
Surgery	81.59	Procedure	ICD-9-CM	Revision of joint replacement of lower extremity, not elsewhere classified
Surgery	81.6	Procedure	ICD-9-CM	Other procedures on spine
Surgery	81.61	Procedure	ICD-9-CM	360 degree spinal fusion, single incision approach
Surgery	81.62	Procedure	ICD-9-CM	Fusion or refusion of 2-3 vertebrae
Surgery	81.63	Procedure	ICD-9-CM	Fusion or refusion of 4-8 vertebrae
Surgery	81.64	Procedure	ICD-9-CM	Fusion or refusion of 9 or more vertebrae
Surgery	84.7	Procedure	ICD-9-CM	Adjunct codes for external fixator devices
Surgery	84.71	Procedure	ICD-9-CM	Application of external fixator device, monoplanar system
Surgery	84.72	Procedure	ICD-9-CM	Application of external fixator device, ring system
Surgery	84.73	Procedure	ICD-9-CM	Application of hybrid external fixator device
Thoracic outlet syndrome	353.0	Diagnosis	ICD-9-CM	Brachial plexus lesions
Thoracic outlet syndrome	353.3	Diagnosis	ICD-9-CM	Thoracic root lesions, not elsewhere classified
Tobacco use	1032F	Procedure	CPT-2	Current tobacco smoker or currently exposed to secondhand smoke (Asthma)
Tobacco use	1034F	Procedure	CPT-2	Current tobacco smoker (CAD, CAP, COPD, PV) (DM)
Tobacco use	1035F	Procedure	CPT-2	Current smokeless tobacco user (eg, chew, snuff) (PV)
Tobacco use	305.1	Diagnosis	ICD-9-CM	Nondependent tobacco use disorder
Tobacco use	4000F	Procedure	CPT-2	Tobacco use cessation intervention, counseling (COPD, CAP, CAD, Asthma) (DM) (PV)
Tobacco use	4001F	Procedure	CPT-2	Tobacco use cessation intervention, pharmacologic therapy (COPD, CAD, CAP, PV, Asthma) (DM) (PV)
Tobacco use	4004F	Procedure	CPT-2	Patient screened for tobacco use and received tobacco cessation intervention (counseling, pharmacotherapy, or both), if identified as a tobacco user (PV, CAD)
Tobacco use	649.0	Diagnosis	ICD-9-CM	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium
Tobacco use	649.00	Diagnosis	ICD-9-CM	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, unspecified as to episode of care or not applicable
Tobacco use	649.01	Diagnosis	ICD-9-CM	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, delivered, with or without mention of antepartum condition
Tobacco use	649.02	Diagnosis	ICD-9-CM	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, delivered, with mention of postpartum complication
Tobacco use	649.03	Diagnosis	ICD-9-CM	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, antepartum condition or complication
Tobacco use	649.04	Diagnosis	ICD-9-CM	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, postpartum condition or complication
Tobacco use	989.84	Diagnosis	ICD-9-CM	Toxic effect of tobacco

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Tobacco use	99406	Procedure	CPT-4	Smoking and tobacco use cessation counseling visit; intermediate, greater than 3 minutes up to 10 minutes
Tobacco use	99407	Procedure	CPT-4	Smoking and tobacco use cessation counseling visit; intensive, greater than 10 minutes
Tobacco use	D1320	Procedure	HCPCS	tobacco counseling for the control and prevention of oral disease
Tobacco use	G0436	Procedure	HCPCS	Smoking and tobacco cessation counseling visit for the asymptomatic patient; intermediate, greater than 3 minutes, up to 10 minutes
Tobacco use	G0437	Procedure	HCPCS	Smoking and tobacco cessation counseling visit for the asymptomatic patient; intensive, greater than 10 minutes
Tobacco use	G8688	Procedure	HCPCS	Currently a smokeless tobacco user (e.g., chew, snuff) and no exposure to secondhand smoke
Tobacco use	G8692	Procedure	HCPCS	Current smokeless tobacco user (e.g., chew, snuff) and no exposure to secondhand smoke
Tobacco use	G9016	Procedure	HCPCS	Smoking cessation counseling, individual, in the absence of or in addition to any other evaluation and management service, per session (6-10 minutes) [demo project code only]
Tobacco use	S4995	Procedure	HCPCS	Smoking cessation gum
Tobacco use	S9075	Procedure	HCPCS	Smoking cessation treatment
Tobacco use	S9453	Procedure	HCPCS	Smoking cessation classes, nonphysician provider, per session
Tobacco use	V15.82	Diagnosis	ICD-9-CM	Personal history of tobacco use, presenting hazards to health
Venous catheterization	36481	Procedure	CPT-4	Percutaneous portal vein catheterization by any method
Venous catheterization	36500	Procedure	CPT-4	Venous catheterization for selective organ blood sampling
Venous catheterization	36556	Procedure	CPT-4	Insertion of non-tunneled centrally inserted central venous catheter; age 5 years or older
Venous catheterization	36558	Procedure	CPT-4	Insertion of tunneled centrally inserted central venous catheter, without subcutaneous port or pump; age 5 years or older
Venous catheterization	36561	Procedure	CPT-4	Insertion of tunneled centrally inserted central venous access device, with subcutaneous port; age 5 years or older
Venous catheterization	36563	Procedure	CPT-4	Insertion of tunneled centrally inserted central venous access device with subcutaneous pump
Venous catheterization	36565	Procedure	CPT-4	Insertion of tunneled centrally inserted central venous access device, requiring 2 catheters via 2 separate venous access sites; without subcutaneous port or pump (eg, Tesio type catheter)
Venous catheterization	36566	Procedure	CPT-4	Insertion of tunneled centrally inserted central venous access device, requiring 2 catheters via 2 separate venous access sites; with subcutaneous port(s)
Venous catheterization	36569	Procedure	CPT-4	Insertion of peripherally inserted central venous catheter (PICC), without subcutaneous port or pump; age 5 years or older
Venous catheterization	36571	Procedure	CPT-4	Insertion of peripherally inserted central venous access device, with subcutaneous port; age 5 years or older
Venous catheterization	36575	Procedure	CPT-4	Repair of tunneled or non-tunneled central venous access catheter, without subcutaneous port or pump, central or peripheral insertion site
Venous catheterization	36576	Procedure	CPT-4	Repair of central venous access device, with subcutaneous port or pump, central or peripheral insertion site
Venous catheterization	36578	Procedure	CPT-4	Replacement, catheter only, of central venous access device, with subcutaneous port or pump, central or peripheral insertion site
Venous catheterization	36580	Procedure	CPT-4	Replacement, complete, of a non-tunneled centrally inserted central venous catheter, without subcutaneous port or pump, through same venous access
Venous catheterization	36581	Procedure	CPT-4	Replacement, complete, of a tunneled centrally inserted central venous catheter, without subcutaneous port or pump, through same venous access
Venous catheterization	36582	Procedure	CPT-4	Replacement, complete, of a tunneled centrally inserted central venous access device, with subcutaneous port, through same venous access
Venous catheterization	36583	Procedure	CPT-4	Replacement, complete, of a tunneled centrally inserted central venous access device, with subcutaneous pump, through same venous access
Venous catheterization	36584	Procedure	CPT-4	Replacement, complete, of a peripherally inserted central venous catheter (PICC), without subcutaneous port or pump, through same venous access
Venous catheterization	36585	Procedure	CPT-4	Replacement, complete, of a peripherally inserted central venous access device, with subcutaneous port, through same venous access
Venous catheterization	36589	Procedure	CPT-4	Removal of tunneled central venous catheter, without subcutaneous port or pump
Venous catheterization	36590	Procedure	CPT-4	Removal of tunneled central venous access device, with subcutaneous port or pump, central or peripheral insertion
Venous catheterization	36591	Procedure	CPT-4	Collection of blood specimen from a completely implantable venous access device

Appendix H: List of Diagnosis and Procedure Codes Used to Define Covariates

Covariate	Code	Code Category	Code Type	Description
Venous catheterization	36592	Procedure	CPT-4	Collection of blood specimen using established central or peripheral catheter, venous, not otherwise specified
Venous catheterization	36593	Procedure	CPT-4	Declotting by thrombolytic agent of implanted vascular access device or catheter
Venous catheterization	36595	Procedure	CPT-4	Mechanical removal of pericatheter obstructive material (eg, fibrin sheath) from central venous device via separate venous access
Venous catheterization	36596	Procedure	CPT-4	Mechanical removal of intraluminal (intracatheter) obstructive material from central venous device through device lumen
Venous catheterization	36597	Procedure	CPT-4	Repositioning of previously placed central venous catheter under fluoroscopic guidance
Venous catheterization	36598	Procedure	CPT-4	Contrast injection(s) for radiologic evaluation of existing central venous access device, including fluoroscopy, image documentation and report
Venous catheterization	38.93	Procedure	ICD-9-CM	Venous catheterization, not elsewhere classified
Venous catheterization	38.97	Procedure	ICD-9-CM	Central venous catheter placement with guidance

Appendix I: List of Generic and Brand Names used to Define Drug Covariate

Covariate	Generic Name	Brand Name
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Lo-Ovral (28)
Non-study Combined Hormonal Contraceptives	ETHYNODIOL DIACETATE-ETHINYL ESTRADIOL	Demulen 1/50 (28)
Non-study Combined Hormonal Contraceptives	ETHYNODIOL DIACETATE-ETHINYL ESTRADIOL	Demulen 1/35 (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Desogen
Non-study Combined Hormonal Contraceptives	ETONOGESTREL/ETHINYL ESTRADIOL	NuvaRing
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Cyclessa (28)
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Ortho Tri-Cyclen Lo (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-MESTRANOL	Ortho-Novum 1/50 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Modicon (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Ortho-Novum 1/35 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Ortho-Novum 10/11 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Ortho-Novum 7/7/7 (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Ortho-Cept (28)
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Ortho-Cyclen (28)
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Ortho Tri-Cyclen (28)
Non-study Combined Hormonal Contraceptives	NORELGESTROMIN/ETHINYL ESTRADIOL	Ortho Evra
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Zeosa
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Tri-Lo-Sprintec
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Tri-Previfem (28)
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Previfem
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Junel Fe 24
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	Gianvi (28)
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Lo-Ovral (21)
Non-study Combined Hormonal Contraceptives	NORELGESTROMIN/ETHINYL ESTRADIOL	Xulane
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	norgestimate-ethinyl estradiol
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	norethindrone ac-eth estradiol
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	norethindrone-e.estradiol-iron
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL/ETHINYL ESTRADIOL	desog-e.estradiol/e.estradiol
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	drosiprenone-ethinyl estradiol
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL/FERROUS FUMARATE	noreth-ethinyl estradiol-iron
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Estrostep Fe-28
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Femcon Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Lo Loestrin Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Loestrin 24 Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Minastrin 24 Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Lo Minastrin Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Ovcon-35 (28)

Appendix I: List of Generic and Brand Names used to Define Drug Covariate

Covariate	Generic Name	Brand Name
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Ovcon Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Ovcon-35 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Ovcon-50 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Nortrel 0.5/35 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Nortrel 1/35 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Nortrel 1/35 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Nortrel 7/7/7 (28)
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Sprintec (28)
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Tri-Sprintec (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Junel 1/20 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Junel FE 1/20 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Junel 1.5/30 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Junel FE 1.5/30 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Tri-Legest Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Balziva (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Apri
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Cryselle (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL/ETHINYL ESTRADIOL	Kariva (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Velivet Triphasic Regimen (28)
Non-study Combined Hormonal Contraceptives	ETHYNODIOL DIACETATE-ETHINYL ESTRADIOL	Kelnor 1/35 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Aranelle (28)
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	Ocella
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Gildagia
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL/ETHINYL ESTRADIOL	Kimidess (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Cyclafem 1/35 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Cyclafem 7/7/7 (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Emoquette
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Gildess 1.5/30 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Gildess 1/20 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Gildess FE 1.5/30 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Gildess FE 1/20 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Gildess 24 Fe
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Estasylla
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Tri-Estasylla
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Tri-Lo-Estasylla
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	Loryna (28)
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	Syeda

Appendix I: List of Generic and Brand Names used to Define Drug Covariate

Covariate	Generic Name	Brand Name
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Dasetta 7/7/7 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Philith
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Dasetta 1/35 (28)
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Mono-Linyah
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Tri-Linyah
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Elinest
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	desogestrel-ethinyl estradiol
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Wera (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL/ETHINYL ESTRADIOL	Pimtrea (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Larin Fe 1.5/30 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Larin Fe 1/20 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Larin 1.5/30 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Larin 1/20 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Larin 24 Fe
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Juleber
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	TriNessa (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Tilia Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Microgestin FE 1/20 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Necon 1/35 (28)
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	norgestrel-ethinyl estradiol
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	YAZ (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Loestrin Fe 1/20 (28-Day)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Reclipsen (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Necon 0.5/35 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Tarina Fe 1/20 (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Cyred
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	Yasmin (28)
Non-study Combined Hormonal Contraceptives	DROSPIRENONE/ETHINYL ESTRADIOL/LEVOMEFOLATE CALCIUM	Safyral
Non-study Combined Hormonal Contraceptives	DROSPIRENONE/ETHINYL ESTRADIOL/LEVOMEFOLATE CALCIUM	Beyaz
Non-study Combined Hormonal Contraceptives	ESTRADIOL VALERATE/DIENOGEST	Natazia
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Loestrin 1/20 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Loestrin 1.5/30 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Loestrin Fe 1.5/30 (28-Day)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL/ETHINYL ESTRADIOL	Mircette (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Caziant (28)
Non-study Combined Hormonal Contraceptives	ETHYNODIOL DIACETATE-ETHINYL ESTRADIOL	Zovia 1/35E (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Microgestin 1.5/30 (21)

Appendix I: List of Generic and Brand Names used to Define Drug Covariate

Covariate	Generic Name	Brand Name
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Microgestin Fe 1.5/30 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Tri-Norinyl (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Leena 28
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Low-Ogestrel (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Layolis Fe
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	TriNessa Lo
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Necon 7/7/7 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Microgestin 24 FE
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Generess Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	ZenChent (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-MESTRANOL	Necon 1/50 (28)
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Mononessa (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Brevicon (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Norinyl 1+35 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-MESTRANOL	Norinyl 1+50 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL	Microgestin 1/20 (21)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL/FERROUS FUMARATE	ZenChent Fe
Non-study Combined Hormonal Contraceptives	ETHYNODIOL DIACETATE-ETHINYL ESTRADIOL	Zovia 1/50E (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Necon 10/11 (28)
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Ogestrel (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL/ETHINYL ESTRADIOL	Azurette (28)
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	Zarah
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	Vestura (28)
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Ovral (21)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Solia
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Cesia (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL/ETHINYL ESTRADIOL	Viorele (28)
Non-study Combined Hormonal Contraceptives	ETHINYL ESTRADIOL/DROSPIRENONE	Nikki (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Ortho-Novum 7/7/7 (21)
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Ovral (28)
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Ovral (4)
Non-study Combined Hormonal Contraceptives	NORGESTREL-ETHINYL ESTRADIOL	Lo-Ovral (8)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE ACETATE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Lomedia 24 Fe
Non-study Combined Hormonal Contraceptives	NORGESTIMATE-ETHINYL ESTRADIOL	Tri-Lo-Marzia
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Vyfemla (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL/ETHINYL ESTRADIOL	Bekyree (28)
Non-study Combined Hormonal Contraceptives	DESOGESTREL-ETHINYL ESTRADIOL	Enskyce

Appendix I: List of Generic and Brand Names used to Define Drug Covariate

Covariate	Generic Name	Brand Name
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Pirmella
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL/FERROUS FUMARATE	Wymzya Fe
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Briellyn
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Alyacen 1/35 (28)
Non-study Combined Hormonal Contraceptives	NORETHINDRONE-ETHINYL ESTRADIOL	Alyacen 7/7/7 (28)

Appendix J: Specifications for Request ID cder_mpl2p_wp001_nsdp_v01

The Center for Drug Evaluation and Research (CDER) requested execution of the Cohort Identification and Descriptive Analysis (CIDA) tool, Version 3.3.3, and a Rapid Analytic Development and Response (RADaR) module to investigate the risk of venous thromboembolism (VTE) among new users of continuous and extended combined oral contraceptives (COCs) compared to new users of cyclic COCs. There were a total of 7 scenarios in this request with varying maximum episode durations, exposure groups, exposure incidence criteria, and outcome definitions.

Query Period: May 22, 2007 - September 30, 2015

Coverage Requirement: Medical and Drug Coverage

Enrollment Requirement: 183 Days

Enrollment Gap: 45 Days

Sex/Age Groups: Females aged 18-24, 25-34, and 35-50

Level of Data Returned from Data Partners: Risk Set Level

Drug/Exposure	Comparison 1: Primary Analysis		Comparison 2		Comparison 3		Comparison 4		Comparison 5		Comparison 6		Comparison 7	
	Exposure	Comparator												
Incident Exposure/Comparator	Continuous and extended COCs	Cyclic COCs	Continuous	Cyclic COCs	Extended COCs	Cyclic COCs								
Incident w/ Respect to:	Continuous and extended COCs	Cyclic COCs	All combined hormonal contraceptives		Continuous and extended COCs	Cyclic COCs	Continuous and extended COCs	Cyclic COCs	Continuous and extended COCs	Cyclic COCs	Continuous	Cyclic COCs	Extended COCs	Cyclic COCs
Washout (days)	1 to 183 days before exposure													
Episode Gap	30 days													
Episode Extension Period	30 days													
Minimum Episode Duration	None													
Maximum Episode Duration	None		None		None		90 days		183 days		None		None	
Minimum Days Supplied	None													
Episode Truncation at Death	Yes													
Episode Truncation by Other Exposures/Conditions	Switching to another oral or non-oral combined hormonal contraceptive or any progestin-only contraceptive, birth delivery (IP), or pregnancy start*		Switching to another oral or non-oral combined hormonal contraceptive or any progestin-only contraceptive, birth delivery (IP), or pregnancy start*		Switching to another oral or non-oral combined hormonal contraceptive or any progestin-only contraceptive, birth delivery (IP), or pregnancy start*		Switching to another oral or non-oral combined hormonal contraceptive or any progestin-only contraceptive, birth delivery (IP), or pregnancy start*		Switching to another oral or non-oral combined hormonal contraceptive or any progestin-only contraceptive, birth delivery (IP), or pregnancy start*		Switching to another oral or non-oral combined hormonal contraceptive or any progestin-only contraceptive, birth delivery (IP), or pregnancy start*		Switching to another oral or non-oral combined hormonal contraceptive or any progestin-only contraceptive, birth delivery (IP), or pregnancy start*	
Pre-Existing Conditions Exclusions	Anticoagulant use, malignant cancer diagnosis (except skin) or chemotherapy/radiation use, pregnancy and post-partum status*, transplant and complications, any organ failure, or HIV		Anticoagulant use, malignant cancer diagnosis (except skin) or chemotherapy/radiation use, pregnancy and post-partum status*, transplant and complications, any organ failure, or HIV		Anticoagulant use, malignant cancer diagnosis (except skin) or chemotherapy/radiation use, pregnancy and post-partum status*, transplant and complications, any organ failure, or HIV		Anticoagulant use, malignant cancer diagnosis (except skin) or chemotherapy/radiation use, pregnancy and post-partum status*, transplant and complications, any organ failure, or HIV		Anticoagulant use, malignant cancer diagnosis (except skin) or chemotherapy/radiation use, pregnancy and post-partum status*, transplant and complications, any organ failure, or HIV		Anticoagulant use, malignant cancer diagnosis (except skin) or chemotherapy/radiation use, pregnancy and post-partum status*, transplant and complications, any organ failure, or HIV		Anticoagulant use, malignant cancer diagnosis (except skin) or chemotherapy/radiation use, pregnancy and post-partum status*, transplant and complications, any organ failure, or HIV	
Care Settings/PDX	Any													
Lookback Period	1 to 183 days before exposure													
Event/Outcome	VTE		VTE		Broad definition: IP diagnosis of VTE or AV/OA diagnosis of VTE plus anticoagulant treatment within 4 weeks following the AV/OA VTE diagnosis		VTE		VTE		VTE		VTE	
Care Setting/PDX	Inpatient		Inpatient		Broad definition: IP diagnosis of VTE or AV/OA diagnosis of VTE plus anticoagulant treatment within 4 weeks following the AV/OA VTE diagnosis		Inpatient		Inpatient		Inpatient		Inpatient	
Incident w/ respect to:	VTE		VTE		Broad definition: IP diagnosis of VTE or AV/OA diagnosis of VTE plus anticoagulant treatment within 4 weeks following the AV/OA VTE diagnosis		VTE		VTE		VTE		VTE	
Incident With Respect to Care Setting/PDX	Inpatient		Inpatient		Broad definition: IP diagnosis of VTE or AV/OA diagnosis of VTE plus anticoagulant treatment within 4 weeks following the AV/OA VTE diagnosis		Inpatient		Inpatient		Inpatient diagnosis		Inpatient diagnosis	
Washout (days)	1 to 183 days before exposure													
Blackout Period	1 day													
Propensity Score Matching	Cyclic COCs		N/A (All combined hormonal contraceptives removed due to exposure incidence criteria)		Cyclic COCs		Cyclic COCs		Cyclic COCs		Cyclic and extended COCs		Continuous and cyclic COCs	
Covariates for Any Other Study COCs Use	Continuous and extended COCs													
All Covariates	Please see "Covariate List" tab													
Covariate Evaluation Window	1 to 183 days before exposure													
Covariate Care Setting(s)	Any													
Matching Ratio	1:1 (Fixed)													
Matching Caliper Settings	0.010		0.010		0.010		0.010		0.010		0.010		0.010	
Analysis Type	Unconditional													
Subgroup Analyses	EE 20 mcg doses, EE 30 mcg doses, and age groups 18-24, 25-34, 35-50		EE 20 mcg doses and EE 30 mcg doses		None									

*Pregnancy start and end dates and post-partum periods will be estimated using a modified version of Sentinel's Pregnancy Tool. More information on the pregnancy tool algorithm can be found here: Andrade SE, Davis RL, Cheetham TC, et al. Medication Exposure in Pregnancy Risk Evaluation Program. *Matern Child Health J.* 2012 Oct;16(7):1349-54. doi: 10.1007/s10995-011-0902-x

ICD-9-CM, HCPCS, and CPT codes are provided by Optum360. NDC codes are checked against First Data Bank's "National Drug Data File (NDDF) Plus