

SUPPLEMENTAL MATERIAL

Table S1. International Classification of Disease, Version 9 (ICD-9) Codes Used for Atrial Fibrillation and AF ablation case Identification.

Inclusion Criteria	ICD-9 Codes
Atrial fibrillation (primary position)	427.31
Ablation of heart tissue via a peripherally inserted catheter (any position)	37.34
Exclusion Criteria	ICD-9 Codes
Supraventricular tachycardia	427.0
Ventricular tachycardia	427.1
Atrial flutter	427.32
Other premature beats	427.69
Cardiac dysrhythmia	427.89
Wolf-Parkinson-White	426.7
Lown-Ganong-Levine	426.81
Atrioventricular nodal tachycardia	426.89
Pacemaker implantation	00.50, 00.52, 00.53, 37.71 to 37.79, 37.81 to 37.89
Implantable cardioverter defibrillator implantation	37.94 to 37.98, 00.51, 00.54
Open surgical ablation *	37.33
*Open surgical ablation: excision or destruction of lesion of heart using open approach	

Table S2. ICD 9 codes for admitting diagnosis of readmission.

Causes of Readmission	Result (%)		Level 1	Level 2	Level 3
	No ablation	ablation			
Total Readmission					
Cardiac causes/complication	49.43	59.07	1		
Heart failure	12.03	12.63		A	
Arrhythmia	27.16	35.18		B	
<i>Atrial Fibrillation</i>	22.7	24.8			I
<i>Atrial Flutter</i>	4.8	5.1			III
<i>Heart block excluding 1st degree block</i>	0.2	0.1			II
<i>Sinoatrial node dysfunction</i>	1.51	1.64			V
<i>Paroxysmal ventricular tachycardia</i>	0.67	0.68			VI
<i>Paroxysmal supraventricular tachycardia</i>	0.47	0.52			VII
<i>Others^{&}</i>	3.25	5.15			IV
Ischemic heart disease	3.19	2.31		C	
Heart Valve disease	1.4	0.68		D	
Hypertension	0.29	0.28		E	
Hypotension/dizziness/syncope	1.6	1.42		F	
Pericardial complications	0.42	2.05		G	
Other cardiac complication	3.34	4.52		H	
Overall Vascular causes/complications	1.06	2.22	2		
Infections	7.26	4.85	3		
Septicemia	4.14	2.26		A	
Pulmonary causes/complications	10.51	8.28	4		
Respiratory Failure	1.73	1.01		A	
Chronic obstructive lung diseases	2.98	2.2		B	

Pneumonia	3.61	2.71		C	
Other respiratory causes/complications	2.19	2.36		D	
<i>GI causes/complication</i>	4.69	4.28	5		
<i>Neurological complications</i>	4.06	2.8	6		
Ischemic Stroke/Transient ischemic attack	2.48	1.59		A	
Other Neurological causes/complications	1.58	1.21		B	
<i>Kidney or Urinary causes/complications</i>	5.42	3.73	7		
Electrolyte imbalance	0.89	0.79		A	
Acute/Acute on chronic kidney failure	2.34	1.51		B	
Other kidney/urinary tract etiology/complication	2.19	1.43		C	
<i>Hematology</i>	1.28	0.5	8		
Anemia	0.58	0.25		A	
Others	0.7	0.25		B	
<i>Trauma/Fracture/poisoning</i>	2.52	1.2	9		
<i>Endocrine causes</i>	1.07	0.58	10		
Diabetes mellitus	0.77	0.37		A	
Others	0.3	0.21		B	
<i>Malignancy</i>	2.27	1.21	11		
<i>Bleeding complications</i>	4.09	4.99	12		
Gastrointestinal bleed	2.6	1.7		A	
Intracranial bleed	0.57	0.59		B	
<i>Intracranial bleed without trauma</i>	0.29	0.39			I
<i>Intracranial bleed with trauma</i>	0.28	0.2			II
Other bleeding complications	0.92	2.7		C	
<i>Psychiatry causes</i>	1.68	0.67	13		
<i>Pulmonary Embolism (PE)/Deep Venous Thrombosis (DVT)</i>	0.91	1.1	14		
<i>Others</i>[¥]	4.71	4.54	15		
<p>¥ : Skin, subcutaneous, joints, nonspecific lab findings, nonspecific symptoms & : Other Arrhythmia Includes: Anomalous atrioventricular excitation, Long QT syndrome, Other specified conduction disorders, Conduction disorder, unspecified, Paroxysmal tachycardia, unspecified, Supraventricular premature beats, Other</p>					

premature beats, Other specified cardiac dysrhythmias, Cardiac dysrhythmia, unspecified, *First Degree AV block, Ventricular Fibrillation, Cardiac Arrest*

Description of ICD codes for etiology of 90 days readmission.

DX1	ablation	Description of ICD codes	Level 1	Level 2	Level 3
39891	0.036260668	Rheumatic heart failure (congestive)	1	A	
40291	0.26092969	Unspecified hypertensive heart disease with heart failure	1	A	
40401	0.022279705	Hypertensive heart and chronic kidney disease, malignant, with heart failure and with chronic kidney disease stage I through stage IV, or unspecified	1	A	
40491	0.338849599	Hypertensive heart and chronic kidney disease, unspecified, with heart failure and with chronic kidney disease stage I through stage IV, or unspecified	1	A	
40493	0.050807221	Hypertensive heart and chronic kidney disease, unspecified, with heart failure and chronic kidney disease stage V or end stage renal disease	1	A	
4280	2.394352994	Congestive heart failure, unspecified	1	A	
42821	0.27394774	Acute systolic heart failure	1	A	
42822	0.349072797	Chronic systolic heart failure	1	A	
42823	4.25221247	Acute on chronic systolic heart failure	1	A	
42830	0.259192667	Diastolic heart failure, unspecified	1	A	
42831	0.81341855	Acute diastolic heart failure	1	A	
42832	0.104429961	Chronic diastolic heart failure	1	A	
42833	2.654674356	Acute on chronic diastolic heart failure	1	A	
42841	0.134342438	Acute combined systolic and diastolic heart failure	1	A	
42842	0.06952436	Chronic combined systolic and diastolic heart failure	1	A	
42843	0.618413088	Acute on chronic combined systolic and diastolic heart failure	1	A	
	12.6327083				
42731	24.75072829	Atrial fibrillation	1	B	I
4260	0.080683542	Atrioventricular block, complete	1	B	II
42613	0.022784517	Other second degree atrioventricular block	1	B	II

4266	0.038978028	Other heart block	1	B	II
	0.142446087				
42732	5.091023432	Atrial flutter	1	B	III
42611	0.021530677	First degree atrioventricular block	1	B	IV
42682	0.027033107	Long QT syndrome	1	B	IV
4270	0.51751844	Paroxysmal supraventricular tachycardia	1	B	VI
4271	0.683194576	Paroxysmal ventricular tachycardia	1	B	VII
42741	0.050504862	Ventricular fibrillation	1	B	IV
4275	0.054151914	Cardiac arrest	1	B	IV
42761	0.024487388	Supraventricular premature beats	1	B	IV
42769	0.028269532	Other premature beats	1	B	IV
42781	1.637933889	Sinoatrial node dysfunction	1	B	V
42789	2.105232573	Other specified cardiac dysrhythmias	1	B	IV
	5.149856958				
41011	0.022063184	Acute myocardial infarction of other anterior wall, initial episode of care	1	C	
41031	0.020023381	Acute myocardial infarction of inferoposterior wall, initial episode of care	1	C	
41041	0.063151413	Acute myocardial infarction of other inferior wall, initial episode of care	1	C	
41071	0.606229818	Subendocardial infarction, initial episode of care	1	C	
41091	0.032394118	Acute myocardial infarction of unspecified site, initial episode of care	1	C	
4111	0.078918602	Intermediate coronary syndrome	1	C	
41189	0.022315896	Other acute and subacute forms of ischemic heart disease, other	1	C	
4139	0.065858959	Other and unspecified angina pectoris	1	C	
41400	0.202706286	Coronary atherosclerosis of unspecified type of vessel, native or graft	1	C	
41401	1.087796989	Coronary atherosclerosis of native coronary artery	1	C	
41402	0.047806561	Coronary atherosclerosis of autologous vein bypass graft	1	C	
4148	0.064327422	Other specified forms of chronic ischemic heart disease	1	C	
	2.313592629				
3963	0.020267879	Mitral valve insufficiency and aortic valve insufficiency	1	D	
4240	0.361413326	Mitral valve disorders	1	D	

4241	0.293776683	Aortic valve disorders	1	D	
	0.675457888				
4010	0.109288697	Malignant essential hypertension	1	E	
4019	0.172022664	Unspecified essential hypertension	1	E	
	0.281311361				
4580	0.285757077	Orthostatic hypotension	1	F	
45821	0.02426044	Hypotension of hemodialysis	1	F	
45829	0.196623041	Other iatrogenic hypotension	1	F	
4589	0.164733289	Hypotension, unspecified	1	F	
7802	0.573606766	Syncope and collapse	1	F	
7804	0.176691901	Dizziness and giddiness	1	F	
	1.421672513				
42090	0.355718794	Acute pericarditis, unspecified	1	G	
42099	0.14066765	Other acute pericarditis	1	G	
4230	0.075688301	Hemopericardium	1	G	
4232	0.055389334	Constrictive pericarditis	1	G	
4238	0.075844492	Other specified diseases of pericardium	1	G	
4239	1.348453844	Unspecified disease of pericardium	1	G	
	2.051762415				
4254	0.074442147	Other primary cardiomyopathies	1	H	
4290	0.017572024	Myocarditis, unspecified	1	H	
4294	0.148575471	Functional disturbances following cardiac surgery	1	H	
42983	0.023045581	Takotsubo syndrome	1	H	
7455	0.042598319	Ostium secundum type atrial septal defect	1	H	
7851	0.157671603	Palpitations	1	H	
78650	0.923288135	Chest pain, unspecified	1	H	
78651	0.100928073	Precordial pain	1	H	
78659	1.519489914	Other chest pain	1	H	
99600	0.04310468	Mechanical complication of unspecified cardiac device, implant, and graft	1	H	
99601	0.453928226	Mechanical complication due to cardiac pacemaker (electrode)	1	H	

99604	0.195855863	Mechanical complication of automatic implantable cardiac defibrillator	1	H	
99672	0.12590532	Other complications due to other cardiac device, implant, and graft	1	H	
9971	0.603461292	Cardiac complications, not elsewhere classified	1	H	
V5331	0.039334151	Fitting and adjustment of cardiac pacemaker	1	H	
V5332	0.048872124	Fitting and adjustment of automatic implantable cardiac defibrillator	1	H	
	4.518072923				
44020	0.013397492	Atherosclerosis of native arteries of the extremities, unspecified	2		
44021	0.023057559	Atherosclerosis of native arteries of the extremities with intermittent claudication	2		
44024	0.045106725	Atherosclerosis of native arteries of the extremities with gangrene	2		
44029	0.028047767	Other atherosclerosis of native arteries of the extremities	2		
4412	0.020326126	Thoracic aneurysm without mention of rupture	2		
4413	0.024479696	Abdominal aneurysm, ruptured	2		
4414	0.065474007	Abdominal aneurysm without mention of rupture	2		
4420	0.017895652	Aneurysm of artery of upper extremity	2		
4423	0.284727006	Aneurysm of artery of lower extremity	2		
44289	0.023981838	Aneurysm of other specified artery	2		
44421	0.020957239	Arterial embolism and thrombosis of upper extremity	2		
44422	0.089583761	Arterial embolism and thrombosis of lower extremity	2		
44489	0.035037732	Embolism and thrombosis of other specified artery	2		
4465	0.023057559	Giant cell arteritis	2		
4470	0.182151689	Arteriovenous fistula, acquired	2		
4510	0.021922564	Phlebitis and thrombophlebitis of superficial vessels of lower extremities	2		
45184	0.017840459	Phlebitis and thrombophlebitis of upper extremities, unspecified	2		
99674	0.028833012	Other complications due to other vascular device, implant, and graft	2		
9972	1.255313437	Peripheral vascular complications, not elsewhere classified	2		
	2.221191322				
0380	0.136066697	Streptococcal septicemia	3	A	
03811	0.028966746	Methicillin susceptible Staphylococcus aureus septicemia	3	A	
03812	0.154779337	Methicillin resistant Staphylococcus aureus septicemia	3	A	

0383	0.017757387	Septicemia due to anaerobes	3	A	
03842	0.357216436	Septicemia due to escherichia coli [E. coli]	3	A	
03843	0.022315896	Septicemia due to pseudomonas	3	A	
03849	0.027947085	Other septicemia due to gram-negative organisms	3	A	
0388	0.071670923	Other specified septicemias	3	A	
0389	1.441544859	Unspecified septicemia	3	A	
	2.258265365				
0059	0.021390532	Food poisoning, unspecified	3		
00845	0.260626307	Intestinal infection due to Clostridium difficile	3		
0088	0.139796411	Intestinal infection due to other organism, not elsewhere classified	3		
01194	0.026122222	Pulmonary tuberculosis, unspecified, tubercle bacilli not found (in sputum) by microscopy, but found by bacterial culture	3		
01334	0.026678743	Tuberculous abscess of brain, tubercle bacilli not found (in sputum) by microscopy, but found by bacterial culture	3		
042	0.028437902	Human immunodeficiency virus [HIV] disease	3		
0521	0.022704984	Varicella (hemorrhagic) pneumonitis	3		
0539	0.032659007	Herpes zoster without mention of complication	3		
0543	0.02870589	Herpetic meningoencephalitis	3		
0661	0.029205856	Tick-borne fever	3		
0793	0.03360116	Rhinovirus infection in conditions classified elsewhere and of unspecified site	3		
07999	0.044178219	Unspecified viral infection	3		
1122	0.0534164	Candidiasis of other urogenital sites	3		
135	0.025148565	Sarcoidosis	3		
68110	0.097798585	Cellulitis and abscess of toe, unspecified	3		
6822	0.038824707	Cellulitis and abscess of trunk	3		
6823	0.055250868	Cellulitis and abscess of upper arm and forearm	3		
6824	0.046259518	Cellulitis and abscess of hand, except fingers and thumb	3		
6826	0.428566782	Cellulitis and abscess of leg, except foot	3		
6827	0.128293092	Cellulitis and abscess of foot, except toes	3		
73027	0.03360116	Unspecified osteomyelitis, ankle and foot	3		
73028	0.020957239	Unspecified osteomyelitis, other specified sites	3		

7907	0.094375165	Bacteremia	3		
99590	0.041767526	Systemic inflammatory response syndrome, unspecified	3		
99661	0.17338163	Infection and inflammatory reaction due to cardiac device, implant, and graft	3		
99664	0.234830809	Infection and inflammatory reaction due to indwelling urinary catheter	3		
99666	0.043854421	Infection and inflammatory reaction due to internal joint prosthesis	3		
99667	0.022063184	Infection and inflammatory reaction due to other internal orthopedic device, implant, and graft	3		
99859	0.321007481	Other postoperative infection	3		
99932	0.018150387	Bloodstream infection due to central venous catheter	3		
99939	0.018150387	Infection following other infusion, injection, transfusion, or vaccination	3		
	2.589805139				
51881	0.763202778	Acute respiratory failure	4	A	
51884	0.250306247	Acute and chronic respiratory failure	4	A	
	1.013509025				
4660	0.151318822	Acute bronchitis	4	B	
490	0.020267879	Bronchitis, not specified as acute or chronic	4	B	
4911	0.024684601	Mucopurulent chronic bronchitis	4	B	
49120	0.039019255	Obstructive chronic bronchitis without exacerbation	4	B	
49121	1.0417203	Obstructive chronic bronchitis with (acute) exacerbation	4	B	
49122	0.229241673	Obstructive chronic bronchitis with acute bronchitis	4	B	
49322	0.491647219	Chronic obstructive asthma with (acute) exacerbation	4	B	
49390	0.022021018	Asthma, unspecified type, unspecified	4	B	
49392	0.124782816	Asthma, unspecified type, with (acute) exacerbation	4	B	
4941	0.055823606	Bronchiectasis with acute exacerbation	4	B	
	2.20052719				
4809	0.022010802	Viral pneumonia, unspecified	4	C	
481	0.060852068	Pneumococcal pneumonia [<i>Streptococcus pneumoniae</i> pneumonia]	4	C	
4820	0.027645378	Pneumonia due to <i>Klebsiella pneumoniae</i>	4	C	
4821	0.016968196	Pneumonia due to <i>Pseudomonas</i>	4	C	
48230	0.020643239	Pneumonia due to <i>Streptococcus</i> , unspecified	4	C	

48242	0.143466103	Methicillin resistant pneumonia due to Staphylococcus aureus	4	C	
48282	0.022233483	Pneumonia due to escherichia coli [E. coli]	4	C	
48283	0.088907243	Pneumonia due to other gram-negative bacteria	4	C	
4829	0.100730307	Bacterial pneumonia, unspecified	4	C	
4830	0.026572638	Pneumonia due to mycoplasma pneumoniae	4	C	
486	2.042984744	Pneumonia, organism unspecified	4	C	
78652	0.113025149	Painful respiration	4	C	
99732	0.028118325	Postprocedural aspiration pneumonia	4	C	
	2.714157674				
32723	0.026678743	Obstructive sleep apnea (adult)(pediatric)	4	D	
4150	0.02316971	Acute cor pulmonale	4	D	
4168	0.164016134	Other chronic pulmonary heart diseases	4	D	
4169	0.023826119	Chronic pulmonary heart disease, unspecified	4	D	
4178	0.020074971	Other specified diseases of pulmonary circulation	4	D	
4659	0.053196332	Acute upper respiratory infections of unspecified site	4	D	
5070	0.541593443	Pneumonitis due to inhalation of food or vomitus	4	D	
5109	0.080316618	Empyema without mention of fistula	4	D	
5110	0.027006956	Pleurisy without mention of effusion or current tuberculosis	4	D	
51189	0.083657233	Other specified forms of effusion, except tuberculous	4	D	
5119	0.371785312	Unspecified pleural effusion	4	D	
51289	0.01846304	Other pneumothorax	4	D	
5130	0.040988001	Abscess of lung	4	D	
514	0.037261679	Pulmonary congestion and hypostasis	4	D	
515	0.01846304	Postinflammatory pulmonary fibrosis	4	D	
51633	0.020373628	Acute interstitial pneumonitis	4	D	
5183	0.020074747	Pulmonary eosinophilia	4	D	
5184	0.175058783	Acute edema of lung, unspecified	4	D	
51852	0.023789873	Other pulmonary insufficiency, not elsewhere classified, following trauma and surgery	4	D	
51889	0.026642464	Other diseases of lung, not elsewhere classified	4	D	
5194	0.029361994	Disorders of diaphragm	4	D	
78605	0.089608612	Shortness of breath	4	D	

78609	0.177222458	Other respiratory abnormalities	4	D	
7862	0.02807022	Cough	4	D	
79902	0.040909349	Hypoxemia	4	D	
99739	0.199195271	Other respiratory complications	4	D	
	2.360804729				
4552	0.127390769	Internal hemorrhoids with other complication	5		
4555	0.022737437	External hemorrhoids with other complication	5		
4558	0.023045581	Unspecified hemorrhoids with other complication	5		
5300	0.022328934	Achalasia and cardiospasm	5		
53010	0.024535294	Esophagitis, unspecified	5		
53020	0.024560055	Ulcer of esophagus without bleeding	5		
5305	0.022109071	Dyskinesia of esophagus	5		
53081	0.127175746	Esophageal reflux	5		
53500	0.041934774	Acute gastritis, without mention of hemorrhage	5		
53540	0.031077002	Other specified gastritis, without mention of hemorrhage	5		
53550	0.055488752	Unspecified gastritis and gastroduodenitis, without mention of hemorrhage	5		
5362	0.026433865	Persistent vomiting	5		
5363	0.050281482	Gastroparesis	5		
53649	0.072158129	Other gastrostomy complications	5		
5368	0.023655384	Dyspepsia and other specified disorders of function of stomach	5		
5370	0.022063184	Acquired hypertrophic pyloric stenosis	5		
53989	0.025148565	Other complications of other bariatric procedure	5		
5401	0.017938786	Acute appendicitis with peritoneal abscess	5		
5409	0.06744836	Acute appendicitis without mention of peritonitis	5		
5565	0.021445482	Left-sided ulcerative (chronic) colitis	5		
5570	0.05245093	Acute vascular insufficiency of intestine	5		
5571	0.028017117	Chronic vascular insufficiency of intestine	5		
5579	0.159813863	Unspecified vascular insufficiency of intestine	5		
5589	0.20132546	Other and unspecified noninfectious gastroenteritis and colitis	5		
5601	0.14115512	Paralytic ileus	5		
5602	0.027482138	Volvulus	5		

56031	0.023919827	Gallstone ileus	5		
56081	0.073265999	Intestinal or peritoneal adhesions with obstruction (postoperative) (postinfection)	5		
56089	0.020163643	Other specified intestinal obstruction	5		
5609	0.370408126	Unspecified intestinal obstruction	5		
56211	0.175326626	Diverticulitis of colon (without mention of hemorrhage)	5		
56400	0.019088203	Constipation, unspecified	5		
5641	0.051957152	Irritable bowel syndrome	5		
5650	0.031334939	Anal fissure	5		
566	0.030419047	Abscess of anal and rectal regions	5		
5680	0.024479696	Peritoneal adhesions (postoperative) (postinfection)	5		
5693	0.197273043	Hemorrhage of rectum and anus	5		
56949	0.035084099	Other specified disorders of rectum and anus	5		
5711	0.021843967	Acute alcoholic hepatitis	5		
5712	0.028047767	Alcoholic cirrhosis of liver	5		
5715	0.02807022	Cirrhosis of liver without mention of alcohol	5		
5722	0.068355161	Hepatic encephalopathy	5		
5724	0.044807052	Hepatorenal syndrome	5		
5728	0.035266334	Other sequelae of chronic liver disease	5		
57400	0.300451766	Calculus of gallbladder with acute cholecystitis, without mention of obstruction	5		
57410	0.072650562	Calculus of gallbladder with other cholecystitis, without mention of obstruction	5		
57420	0.116658862	Calculus of gallbladder without mention of cholecystitis, without mention of obstruction	5		
57470	0.022021018	Calculus of gallbladder and bile duct with other cholecystitis, without mention of obstruction	5		
57471	0.038747188	Calculus of gallbladder and bile duct with other cholecystitis, with obstruction	5		
5750	0.019088559	Acute cholecystitis	5		
57511	0.056099578	Chronic cholecystitis	5		
57512	0.027898063	Acute and chronic cholecystitis	5		

5761	0.057820231	Cholangitis	5		
5768	0.018083929	Other specified disorders of biliary tract	5		
5770	0.200076022	Acute pancreatitis	5		
5772	0.02419763	Cyst and pseudocyst of pancreas	5		
78701	0.157341961	Nausea with vomiting	5		
78720	0.022481685	Dysphagia, unspecified	5		
78900	0.137975585	Abdominal pain, unspecified site	5		
78901	0.030904698	Abdominal pain, right upper quadrant	5		
78902	0.02055134	Abdominal pain, left upper quadrant	5		
78903	0.027033107	Abdominal pain, right lower quadrant	5		
78906	0.080481626	Abdominal pain, epigastric	5		
78907	0.021333622	Abdominal pain, generalized	5		
78909	0.022906986	Abdominal pain, other specified site	5		
9974	0.065839732	Digestive system complications not elsewhere classified	5		
	4.27895593				
43310	0.088495449	Occlusion and stenosis of carotid artery without mention of cerebral infarction	6	A	
43311	0.020127765	Occlusion and stenosis of carotid artery with cerebral infarction	6	A	
43400	0.019990596	Cerebral thrombosis without mention of cerebral infarction	6	A	
43411	0.268359186	Cerebral embolism with cerebral infarction	6	A	
43490	0.031297694	Cerebral artery occlusion, unspecified without mention of cerebral infarction	6	A	
43491	0.599008419	Cerebral artery occlusion, unspecified with cerebral infarction	6	A	
4358	0.024059479	Other specified transient cerebral ischemias	6	A	
4359	0.497080041	Unspecified transient cerebral ischemia	6	A	
4370	0.023644182	Cerebral atherosclerosis	6	A	
4371	0.017411889	Other generalized ischemic cerebrovascular disease	6	A	
	1.589474699				
3310	0.028978913	Alzheimer's disease	6	B	
3315	0.046496917	Idiopathic normal pressure hydrocephalus (INPH)	6	B	
33182	0.018677599	Dementia with lewy bodies	6	B	
33812	0.028437902	Acute post-thoracotomy pain	6	B	

33818	0.042065329	Other acute postoperative pain	6	B	
33819	0.020267879	Other acute pain	6	B	
3383	0.059194279	Neoplasm related pain (acute) (chronic)	6	B	
3384	0.022015514	Chronic pain syndrome	6	B	
34460	0.022260707	Cauda equina syndrome without mention of neurogenic bladder	6	B	
3453	0.021839017	Grand mal status	6	B	
34540	0.027645378	Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, without mention of intractable epilepsy	6	B	
34580	0.048763783	Other forms of epilepsy and recurrent seizures, without mention of intractable epilepsy	6	B	
34590	0.053359517	Epilepsy, unspecified, without mention of intractable epilepsy	6	B	
34670	0.038757833	Chronic migraine without aura, without mention of intractable migraine without mention of status migrainosus	6	B	
34680	0.048682552	Other forms of migraine, without mention of intractable migraine without mention of status migrainosus	6	B	
34690	0.049047782	Migraine, unspecified, without mention of intractable migraine without mention of status migrainosus	6	B	
34691	0.062629077	Migraine, unspecified, with intractable migraine, so stated, without mention of status migrainosus	6	B	
3481	0.050849013	Anoxic brain damage	6	B	
34830	0.027033107	Encephalopathy, unspecified	6	B	
34831	0.016985689	Metabolic encephalopathy	6	B	
34839	0.067357802	Other encephalopathy	6	B	
34982	0.022548665	Toxic encephalopathy	6	B	
3558	0.03286126	Mononeuritis of lower limb, unspecified	6	B	
3569	0.023625621	Unspecified hereditary and idiopathic peripheral neuropathy	6	B	
3576	0.028833012	Polyneuropathy due to drugs	6	B	
35801	0.021697145	Myasthenia gravis with (acute) exacerbation	6	B	
35979	0.022109071	Other inflammatory and immune myopathies, NEC	6	B	
37739	0.024841249	Other optic neuritis	6	B	
4373	0.035084099	Cerebral aneurysm, nonruptured	6	B	
4377	0.021922564	Transient global amnesia	6	B	

4378	0.025720216	Other ill-defined cerebrovascular disease	6	B	
78009	0.01876572	Other alteration of consciousness	6	B	
78093	0.022867323	Memory loss	6	B	
7820	0.030492612	Disturbance of skin sensation	6	B	
7840	0.047636804	Headache	6	B	
7843	0.03315395	Aphasia	6	B	
	1.213504901				
2760	0.017572024	Hyperosmolality and/or hypernatremia	7	A	
2761	0.618521898	Hyposmolality and/or hyponatremia	7	A	
2767	0.079441526	Hyperpotassemia	7	A	
2768	0.074592572	Hypopotassemia	7	A	
	0.790128019				
5845	0.08044266	Acute kidney failure with lesion of tubular necrosis	7	B	
5849	1.208624685	Acute kidney failure, unspecified	7	B	
5856	0.058234241	End stage renal disease	7	B	
40300	0.027033107	Hypertensive chronic kidney disease, malignant, with chronic kidney disease stage I through stage IV, or unspecified	7	B	
40390	0.068677231	Hypertensive chronic kidney disease, unspecified, with chronic kidney disease stage I through stage IV, or unspecified	7	B	
40391	0.068788567	Hypertensive chronic kidney disease, unspecified, with chronic kidney disease stage V or end stage renal disease	7	B	
	1.51180049				
59000	0.022439692	Chronic pyelonephritis without lesion of renal medullary necrosis	7	C	
59080	0.022546188	Pyelonephritis, unspecified	7	C	
5921	0.150934329	Calculus of ureter	7	C	
5939	0.024841249	Unspecified disorder of kidney and ureter	7	C	
59582	0.022328934	Irradiation cystitis	7	C	
5960	0.077217066	Bladder neck obstruction	7	C	
5990	0.606997487	Urinary tract infection, site not specified	7	C	
60000	0.061018588	Hypertrophy (benign) of prostate without urinary obstruction and other lower urinary tract symptom (LUTS)	7	C	

60001	0.097537179	Hypertrophy (benign) of prostate with urinary obstruction and other lower urinary tract symptoms (LUTS)	7	C	
6010	0.041476277	Acute prostatitis	7	C	
78899	0.020603697	Other symptoms involving urinary system	7	C	
99631	0.097220731	Mechanical complication due to urethral (indwelling) catheter	7	C	
99673	0.060186504	Other complications due to renal dialysis device, implant, and graft	7	C	
99676	0.063223801	Other complications due to genitourinary device, implant, and graft	7	C	
99681	0.027080134	Complications of transplanted kidney	7	C	
9975	0.04171593	Urinary complications, not elsewhere classified	7	C	
	1.437367786				
2809	0.048661546	Iron deficiency anemia, unspecified	8	A	
28319	0.026122222	Other non-autoimmune hemolytic anemias	8	A	
28521	0.044202269	Anemia in chronic kidney disease	8	A	
28522	0.022906986	Anemia in neoplastic disease	8	A	
28529	0.032584921	Anemia of other chronic disease	8	A	
2859	0.072865218	Anemia, unspecified	8	A	
	0.247343161				
28659	0.024965659	Other hemorrhagic disorder due to intrinsic circulating anticoagulants, antibodies, or inhibitors	8	B	
28804	0.033149204	Neutropenia due to infection	8	B	
28981	0.020603697	Primary hypercoagulable state	8	B	
79092	0.173758035	Abnormal coagulation profile	8	B	
	0.252476595				
73382	0.017425632	Nonunion of fracture	9		
8020	0.040446576	Closed fracture of nasal bones	9		
80505	0.027033107	Closed fracture of fifth cervical vertebra	9		
8052	0.0404249	Closed fracture of dorsal [thoracic] vertebra without mention of spinal cord injury	9		
8056	0.045625187	Closed fracture of sacrum and coccyx without mention of spinal cord injury	9		
80702	0.02058344	Closed fracture of two ribs	9		
80703	0.021385729	Closed fracture of three ribs	9		

80705	0.028267075	Closed fracture of five ribs	9		
8082	0.01988548	Closed fracture of pubis	9		
81241	0.027967953	Closed supracondylar fracture of humerus	9		
82003	0.01988548	Closed fracture of base of neck of femur	9		
82009	0.133395741	Other closed transcervical fracture of neck of femur	9		
82021	0.075722232	Closed fracture of intertrochanteric section of neck of femur	9		
8208	0.062935123	Closed fracture of unspecified part of neck of femur	9		
8244	0.051739031	Bimalleolar fracture, closed	9		
8246	0.019409379	Trimalleolar fracture, closed	9		
8250	0.02058344	Fracture of calcaneus, closed	9		
82535	0.021390532	Open fracture of metatarsal bone(s)	9		
85011	0.025720216	Concussion, with loss of consciousness of 30 minutes or less	9		
85181	0.022015514	Other and unspecified cerebral laceration and contusion, without mention of open intracranial wound, with no loss of consciousness	9		
8604	0.021697145	Traumatic pneumothorax without mention of open wound into thorax	9		
86504	0.028150632	Injury to spleen without mention of open wound into cavity, massive parenchymal disruption	9		
8670	0.102836536	Injury to bladder and urethra, without mention of open wound into cavity	9		
87211	0.022233483	Open wound of auricle, ear, complicated	9		
8782	0.023625621	Open wound of scrotum and testes, without mention of complication	9		
8911	0.030590997	Open wound of knee, leg [except thigh], and ankle, complicated	9		
9222	0.022481685	Contusion of abdominal wall	9		
9245	0.017401496	Contusion of unspecified part of lower limb	9		
9551	0.027080134	Injury to median nerve	9		
95901	0.025148565	Head injury, unspecified	9		
9623	0.079011304	Poisoning by insulins and antidiabetic agents	9		
9642	0.02697595	Poisoning by anticoagulants	9		
96509	0.021333622	Poisoning by other opiates and related narcotics	9		
	1.190408935				

25002	0.035084099	Diabetes mellitus without mention of complication, type II or unspecified type, uncontrolled	10	A	
25012	0.022772836	Diabetes with ketoacidosis, type II or unspecified type, uncontrolled	10	A	
25060	0.110178154	Diabetes with neurological manifestations, type II or unspecified type, not stated as uncontrolled	10	A	
25062	0.028097767	Diabetes with neurological manifestations, type II or unspecified type, uncontrolled	10	A	
25070	0.038490504	Diabetes with peripheral circulatory disorders, type II or unspecified type, not stated as uncontrolled	10	A	
25080	0.136826709	Diabetes with other specified manifestations, type II or unspecified type, not stated as uncontrolled	10	A	
	0.371450069				
2410	0.02407807	Nontoxic uninodular goiter	10	B	
2411	0.027645378	Nontoxic multinodular goiter	10	B	
2449	0.051521779	Unspecified acquired hypothyroidism	10	B	
2536	0.109000037	Other disorders of neurohypophysis	10	B	
	0.212245263				
1531	0.017633684	Malignant neoplasm of transverse colon	11		
1532	0.025811039	Malignant neoplasm of descending colon	11		
1533	0.022391323	Malignant neoplasm of sigmoid colon	11		
1536	0.019088559	Malignant neoplasm of ascending colon	11		
1539	0.024902132	Malignant neoplasm of colon, unspecified site	11		
1540	0.030720259	Malignant neoplasm of rectosigmoid junction	11		
1548	0.018853593	Malignant neoplasm of other sites of rectum, rectosigmoid junction, and anus	11		
1571	0.030959489	Malignant neoplasm of body of pancreas	11		
1579	0.020830611	Malignant neoplasm of pancreas, part unspecified	11		
1622	0.048989242	Malignant neoplasm of main bronchus	11		
1623	0.114431349	Malignant neoplasm of upper lobe, bronchus or lung	11		
1625	0.02419763	Malignant neoplasm of lower lobe, bronchus or lung	11		
1628	0.02267155	Malignant neoplasm of other parts of bronchus or lung	11		
1629	0.180118502	Malignant neoplasm of bronchus and lung, unspecified	11		

1759	0.026122222	Malignant neoplasm of other and unspecified sites of male breast	11		
1888	0.027080134	Malignant neoplasm of other specified sites of bladder	11		
1889	0.027967953	Malignant neoplasm of bladder, part unspecified	11		
1890	0.085882059	Malignant neoplasm of kidney, except pelvis	11		
1960	0.026642464	Secondary and unspecified malignant neoplasm of lymph nodes of head, face, and neck	11		
1970	0.028047767	Secondary malignant neoplasm of lung	11		
1972	0.030414229	Secondary malignant neoplasm of pleura	11		
1976	0.027809986	Secondary malignant neoplasm of retroperitoneum and peritoneum	11		
1983	0.042874017	Secondary malignant neoplasm of brain and spinal cord	11		
1985	0.022391323	Secondary malignant neoplasm of bone and bone marrow	11		
20288	0.039591643	Other malignant lymphomas, lymph nodes of multiple sites	11		
20300	0.062910565	Multiple myeloma, without mention of having achieved remission	11		
2111	0.026549563	Benign neoplasm of stomach	11		
2113	0.019631546	Benign neoplasm of colon	11		
2124	0.020730647	Benign neoplasm of pleura	11		
2126	0.022546188	Benign neoplasm of thymus	11		
220	0.052912046	Benign neoplasm of ovary	11		
2396	0.016996711	Neoplasm of unspecified nature of brain	11		
	1.208700022				
5307	0.028519382	Gastroesophageal laceration-hemorrhage syndrome	12	A	
53100	0.029560214	Acute gastric ulcer with hemorrhage, without mention of obstruction	12	A	
53140	0.070234984	Chronic or unspecified gastric ulcer with hemorrhage, without mention of obstruction	12	A	
53240	0.047230789	Chronic or unspecified duodenal ulcer with hemorrhage, without mention of obstruction	12	A	
53541	0.146609817	Other specified gastritis, with hemorrhage	12	A	
53551	0.057966912	Unspecified gastritis and gastroduodenitis, with hemorrhage	12	A	
53783	0.056089196	Angiodysplasia of stomach and duodenum with hemorrhage	12	A	
56212	0.116654317	Diverticulosis of colon with hemorrhage	12	A	
56213	0.042188399	Diverticulitis of colon with hemorrhage	12	A	
56881	0.054450983	Hemoperitoneum (nontraumatic)	12	A	

56985	0.053856857	Angiodysplasia of intestine with hemorrhage	12	A	
56986	0.022546188	Dieulafoy lesion (hemorrhagic) of intestine	12	A	
5780	0.027921217	Hematemesis	12	A	
5781	0.236099113	Blood in stool	12	A	
5789	0.743949585	Hemorrhage of gastrointestinal tract, unspecified	12	A	
	1.733877952				
430	0.033167995	Subarachnoid hemorrhage	12	B	I
431	0.16797725	Intracerebral hemorrhage	12	B	I
4321	0.154745776	Subdural hemorrhage	12	B	I
4329	0.032374601	Unspecified intracranial hemorrhage	12	B	I
	0.388265622				
80021	0.024841249	Closed fracture of vault of skull with subarachnoid, subdural, and extradural hemorrhage, with no loss of consciousness	12	B	II
80422	0.022896283	Closed fractures involving skull or face with other bones with subarachnoid, subdural, and extradural hemorrhage, with brief [less than one hour] loss of consciousness	12	B	II
85220	0.025311751	Subdural hemorrhage following injury without mention of open intracranial wound, unspecified state of consciousness	12	B	II
85221	0.025148565	Subdural hemorrhage following injury without mention of open intracranial wound, with no loss of consciousness	12	B	II
85226	0.01846304	Subdural hemorrhage following injury without mention of open intracranial wound, with loss of consciousness of unspecified duration	12	B	II
85300	0.044066949	Other and unspecified intracranial hemorrhage following injury without mention of open intracranial wound, unspecified state of consciousness	12	B	II
85301	0.01845534	Other and unspecified intracranial hemorrhage following injury without mention of open intracranial wound, with no loss of consciousness	12	B	II
85306	0.020023381	Other and unspecified intracranial hemorrhage following injury without mention of open intracranial wound, with loss of consciousness of unspecified duration	12	B	II
	0.199206558				
2800	0.072612625	Iron deficiency anemia secondary to blood loss (chronic)	12	C	

2851	0.262599305	Acute posthemorrhagic anemia	12	C	
4590	0.027396812	Hemorrhage, unspecified	12	C	
59970	0.016968196	Hematuria, unspecified	12	C	
59971	0.174931325	Gross hematuria	12	C	
7847	0.022704984	Epistaxis	12	C	
78630	0.050112669	Hemoptysis, unspecified	12	C	
78639	0.024981634	Other hemoptysis	12	C	
99811	0.223271551	Hemorrhage complicating a procedure	12	C	
99812	1.831456517	Hematoma complicating a procedure	12	C	
	2.707035616				
2910	0.051087881	Alcohol withdrawal delirium	13		
29181	0.023826119	Alcohol withdrawal	13		
2920	0.04319292	Drug withdrawal	13		
29281	0.021333622	Drug-induced delirium	13		
29572	0.013568769	Schizoaffective disorder, chronic	13		
29620	0.043276318	Major depressive affective disorder, single episode, unspecified	13		
29630	0.101900782	Major depressive affective disorder, recurrent episode, unspecified	13		
29632	0.021842885	Major depressive affective disorder, recurrent episode, moderate	13		
29633	0.042916067	Major depressive affective disorder, recurrent episode, severe, without mention of psychotic behavior	13		
29636	0.016440641	Major depressive affective disorder, recurrent episode, in full remission	13		
29644	0.02058344	Bipolar I disorder, most recent episode (or current) manic, severe, specified as with psychotic behavior	13		
29650	0.038961542	Bipolar I disorder, most recent episode (or current) depressed, unspecified	13		
2989	0.020926464	Unspecified psychosis	13		
30000	0.025009291	Anxiety state, unspecified	13		
30011	0.020221174	Conversion disorder	13		
3004	0.065824229	Dysthymic disorder	13		
30300	0.034044804	Acute alcoholic intoxication in alcoholism, unspecified	13		
30390	0.024965659	Other and unspecified alcohol dependence, unspecified	13		

30590	0.023625621	Other, mixed, or unspecified drug abuse, unspecified	13		
3064	0.018322701	Gastrointestinal malfunction arising from mental factors	13		
	0.67187093				
41511	0.108749282	Iatrogenic pulmonary embolism and infarction	14		
41519	0.462288025	Other pulmonary embolism and infarction	14		
45340	0.121795006	Acute venous embolism and thrombosis of unspecified deep vessels of lower extremity	14		
45341	0.323547821	Acute venous embolism and thrombosis of deep vessels of proximal lower extremity	14		
45381	0.023451559	Acute venous embolism and thrombosis of superficial veins of upper extremity	14		
45382	0.026557052	Acute venous embolism and thrombosis of deep veins of upper extremity	14		
	1.066388745				
27400	0.04376019	Gouty arthropathy, unspecified	15		
27651	0.17104001	Dehydration	15		
27652	0.046370468	Hypovolemia	15		
27661	0.03315395	Transfusion associated circulatory overload	15		
27669	0.159489416	Other fluid overload	15		
2779	0.030982357	Unspecified disorder of metabolism	15		
3693	0.031783037	Unqualified visual loss, both eyes	15		
38610	0.013368982	Peripheral vertigo, unspecified	15		
38611	0.043425706	Benign paroxysmal positional vertigo	15		
4568	0.018945362	Varices of other sites	15		
55200	0.020150896	Femoral hernia with obstruction, unilateral or unspecified (not specified as recurrent)	15		
55221	0.02407807	Incisional ventral hernia with obstruction	15		
5523	0.030982357	Diaphragmatic hernia with obstruction	15		
55329	0.026642464	Other ventral hernia without mention of obstruction or gangrene	15		
6185	0.019328702	Prolapse of vaginal vault after hysterectomy	15		
6273	0.027645378	Postmenopausal atrophic vaginitis	15		
6861	0.022109071	Pyogenic granuloma of skin and subcutaneous tissue	15		

70714	0.024981634	Ulcer of heel and midfoot	15		
70719	0.017974973	Ulcer of other part of lower limb	15		
7092	0.024706975	Scar conditions and fibrosis of skin	15		
7093	0.021922564	Degenerative skin disorders	15		
7098	0.022190336	Other specified disorders of skin	15		
7140	0.027033107	Rheumatoid arthritis	15		
71516	0.114913868	Osteoarthritis, localized, primary, lower leg	15		
71535	0.193021903	Osteoarthritis, localized, not specified whether primary or secondary, pelvic region and thigh	15		
71536	0.266786043	Osteoarthritis, localized, not specified whether primary or secondary, lower leg	15		
71538	0.02573498	Osteoarthritis, localized, not specified whether primary or secondary, other specified sites	15		
71595	0.048739899	Osteoarthritis, unspecified whether generalized or localized, pelvic region and thigh	15		
71596	0.17940187	Osteoarthritis, unspecified whether generalized or localized, lower leg	15		
71617	0.028437902	Traumatic arthropathy, ankle and foot	15		
71681	0.022328934	Other specified arthropathy, shoulder region	15		
71941	0.032685594	Pain in joint, shoulder region	15		
7210	0.18596623	Cervical spondylosis without myelopathy	15		
7211	0.066076362	Cervical spondylosis with myelopathy	15		
7213	0.01968791	Lumbosacral spondylosis without myelopathy	15		
72210	0.042666674	Displacement of lumbar intervertebral disc without myelopathy	15		
72252	0.072767557	Degeneration of lumbar or lumbosacral intervertebral disc	15		
72400	0.024706975	Spinal stenosis, unspecified region	15		
72402	0.087572454	Spinal stenosis, lumbar region, without neurogenic claudication	15		
72403	0.022403526	Spinal stenosis, lumbar region, with neurogenic claudication	15		
7242	0.022755136	Lumbago	15		
7244	0.026642464	Thoracic or lumbosacral neuritis or radiculitis, unspecified	15		
7245	0.022546188	Backache, unspecified	15		
7262	0.040446576	Other affections of shoulder region, not elsewhere classified	15		

72705	0.017633684	Other tenosynovitis of hand and wrist	15		
72886	0.026433865	Necrotizing fasciitis	15		
72889	0.057660293	Other disorders of muscle, ligament, and fascia	15		
7292	0.023184161	Neuralgia, neuritis, and radiculitis, unspecified	15		
72989	0.038317641	Other musculoskeletal symptoms referable to limbs	15		
72992	0.092794399	Nontraumatic hematoma of soft tissue	15		
7336	0.064255409	Tietze's disease	15		
73679	0.02491092	Other acquired deformities of ankle and foot	15		
7384	0.024059479	Acquired spondylolisthesis	15		
78060	0.139079929	Fever, unspecified	15		
78064	0.024061245	Chills (without fever)	15		
78079	0.290358344	Other malaise and fatigue	15		
7823	0.023826119	Edema	15		
7837	0.057378459	Adult failure to thrive	15		
7905	0.064503428	Other nonspecific abnormal serum enzyme levels	15		
8438	0.03340716	Sprains and strains of other specified sites of hip and thigh	15		
8488	0.022867323	Other specified sites of sprains and strains	15		
9352	0.017633684	Foreign body in stomach	15		
99641	0.029141278	Mechanical loosening of prosthetic joint	15		
99642	0.058865503	Dislocation of prosthetic joint	15		
99647	0.022391323	Other mechanical complication of prosthetic joint implant	15		
99649	0.027809986	Other mechanical complication of other internal orthopedic device, implant, and graft	15		
99659	0.037156204	Mechanical complication due to other implant and internal device, not elsewhere classified	15		
99677	0.03360116	Other complications due to internal joint prosthesis	15		
99799	0.056109557	Complications affecting other specified body systems, not elsewhere classified	15		
99809	0.018214029	Postoperative shock, other	15		
99813	0.025463709	Seroma complicating a procedure	15		
9982	0.058028426	Accidental puncture or laceration during a procedure, not elsewhere classified	15		

99851	0.143465291	Infected postoperative seroma	15		
9986	0.130625253	Persistent postoperative fistula	15		
99883	0.023316668	Non-healing surgical wound	15		
99889	0.137017228	Other specified complications of procedures not elsewhere classified	15		
V0382	0.026549563	Other specified vaccinations against streptococcus pneumoniae [pneumococcus]	15		
V553	0.023483821	Attention to colostomy	15		
V5789	0.121395949	Care involving other specified rehabilitation procedure	15		
V5811	0.039591643	Encounter for antineoplastic chemotherapy	15		
V5812	0.039591643	Encounter for antineoplastic immunotherapy	15		

Description of ICD codes for etiology of 30 days readmission.

Dx1	ablation	Description of ICD codes	Level 1	Level 2	Level 3
39891	0.055700183	Rheumatic heart failure (congestive)	1	A	
40291	0.361454887	Unspecified hypertensive heart disease with heart failure	1	A	
40491	0.288356194	Hypertensive heart and chronic kidney disease, unspecified, with heart failure and with chronic kidney disease stage I through stage IV, or unspecified	1	A	
40493	0.044764055	Hypertensive heart and chronic kidney disease, unspecified, with heart failure and chronic kidney disease stage V or end stage renal disease	1	A	
4280	2.794355543	Congestive heart failure, unspecified	1	A	
42821	0.196693549	Acute systolic heart failure	1	A	
42822	0.471497014	Chronic systolic heart failure	1	A	
42823	4.544556808	Acute on chronic systolic heart failure	1	A	
42830	0.331354467	Diastolic heart failure, unspecified	1	A	
42831	1.154282048	Acute diastolic heart failure	1	A	
42832	0.090060658	Chronic diastolic heart failure	1	A	
42833	2.709324398	Acute on chronic diastolic heart failure	1	A	
42841	0.113485779	Acute combined systolic and diastolic heart failure	1	A	
42842	0.027778809	Chronic combined systolic and diastolic heart failure	1	A	
42843	0.580130515	Acute on chronic combined systolic and diastolic heart failure	1	A	
42731	22.64960738	Atrial fibrillation	1	B	I
4260	0.100178058	Atrioventricular block, complete	1	B	II
42613	0.034999404	Other second degree atrioventricular block	1	B	II
4266	0.059874333	Other heart block	1	B	II
42732	4.778286857	Atrial flutter	1	B	III
4270	0.465142096	Paroxysmal supraventricular tachycardia	1	B	VI
4271	0.665015517	Paroxysmal ventricular tachycardia	1	B	VII
42741	0.036599415	Ventricular fibrillation	1	B	IV
4275	0.08318301	Cardiac arrest	1	B	IV

42761	0.037615193	Supraventricular premature beats	1	B	IV
42781	1.507446876	Sinoatrial node dysfunction	1	B	V
42789	2.212772927	Other specified cardiac dysrhythmias	1	B	IV
41041	0.06333183	Acute myocardial infarction of other inferior wall, initial episode of care	1	C	
41071	0.514646269	Subendocardial infarction, initial episode of care	1	C	
41091	0.049760758	Acute myocardial infarction of unspecified site, initial episode of care	1	C	
4111	0.089608235	Intermediate coronary syndrome	1	C	
41189	0.034279553	Other acute and subacute forms of ischemic heart disease, other	1	C	
41400	0.158649864	Coronary atherosclerosis of unspecified type of vessel, native or graft	1	C	
41401	0.866444001	Coronary atherosclerosis of native coronary artery	1	C	
41402	0.031998	Coronary atherosclerosis of autologous vein bypass graft	1	C	
4148	0.060182828	Other specified forms of chronic ischemic heart disease	1	C	
4240	0.233018756	Mitral valve disorders	1	D	
4241	0.113572896	Aortic valve disorders	1	D	
4010	0.053033355	Malignant essential hypertension	1	E	
4019	0.233698648	Unspecified essential hypertension	1	E	
4580	0.328142795	Orthostatic hypotension	1	F	
45821	0.037266576	Hypotension of hemodialysis	1	F	
45829	0.273307835	Other iatrogenic hypotension	1	F	
4589	0.17817814	Hypotension, unspecified	1	F	
7802	0.598893681	Syncope and collapse	1	F	
7804	0.236883041	Dizziness and giddiness	1	F	
42090	0.455966177	Acute pericarditis, unspecified	1	G	
42099	0.216080242	Other acute pericarditis	1	G	
4230	0.116265157	Hemopericardium	1	G	
4232	0.029322026	Constrictive pericarditis	1	G	
4238	0.037181787	Other specified diseases of pericardium	1	G	
4239	1.744647457	Unspecified disease of pericardium	1	G	
4168	0.141103516	Other chronic pulmonary heart diseases	1	H	
4254	0.054855804	Other primary cardiomyopathies	1	H	
4290	0.026992469	Myocarditis, unspecified	1	H	
4294	0.157125375	Functional disturbances following cardiac surgery	1	H	

42983	0.035400427	Takotsubo syndrome	1	H	
7455	0.031282521	Ostium secundum type atrial septal defect	1	H	
7851	0.242200095	Palpitations	1	H	
78650	0.967898327	Chest pain, unspecified	1	H	
78651	0.073361491	Precordial pain	1	H	
78659	1.59797417	Other chest pain	1	H	
99600	0.066213302	Mechanical complication of unspecified cardiac device, implant, and graft	1	H	
99601	0.545730688	Mechanical complication due to cardiac pacemaker (electrode)	1	H	
99604	0.156045269	Mechanical complication of automatic implantable cardiac defibrillator	1	H	
99661	0.180874581	Infection and inflammatory reaction due to cardiac device, implant, and graft	1	H	
99672	0.124851169	Other complications due to other cardiac device, implant, and graft	1	H	
9971	0.808873857	Cardiac complications, not elsewhere classified	1	H	
44020	0.02057995	Atherosclerosis of native arteries of the extremities, unspecified	2		
44024	0.033675355	Atherosclerosis of native arteries of the extremities with gangrene	2		
4412	0.031223058	Thoracic aneurysm without mention of rupture	2		
4413	0.037603377	Abdominal aneurysm, ruptured	2		
4414	0.070495736	Abdominal aneurysm without mention of rupture	2		
4420	0.027489595	Aneurysm of artery of upper extremity	2		
4423	0.39921174	Aneurysm of artery of lower extremity	2		
44289	0.036838614	Aneurysm of other specified artery	2		
44422	0.110842444	Arterial embolism and thrombosis of lower extremity	2		
44489	0.053821626	Embolism and thrombosis of other specified artery	2		
4470	0.250482045	Arteriovenous fistula, acquired	2		
4510	0.033675355	Phlebitis and thrombophlebitis of superficial vessels of lower extremities	2		
45184	0.027404814	Phlebitis and thrombophlebitis of upper extremities, unspecified	2		
99674	0.044290526	Other complications due to other vascular device, implant, and graft	2		
9972	1.849520439	Peripheral vascular complications, not elsewhere classified	2		
0380	0.129111947	Streptococcal septicemia	3	A	
03811	0.044495955	Methicillin susceptible Staphylococcus aureus septicemia	3	A	
03812	0.205759271	Methicillin resistant Staphylococcus aureus septicemia	3	A	
0383	0.027277207	Septicemia due to anaerobes	3	A	
03842	0.354015706	Septicemia due to escherichia coli [E. coli]	3	A	

03843	0.034279553	Septicemia due to pseudomonas	3	A	
0388	0.110094043	Other specified septicemias	3	A	
0389	1.701567667	Unspecified septicemia	3	A	
00845	0.36677978	Intestinal infection due to Clostridium difficile	3		
0088	0.146806013	Intestinal infection due to other organism, not elsewhere classified	3		
01194	0.040126469	Pulmonary tuberculosis, unspecified, tubercle bacilli not found (in sputum) by microscopy, but found by bacterial culture	3		
01334	0.040981343	Tuberculous abscess of brain, tubercle bacilli not found (in sputum) by microscopy, but found by bacterial culture	3		
042	0.043683596	Human immunodeficiency virus [HIV] disease	3		
0521	0.034877233	Varicella (hemorrhagic) pneumonitis	3		
0539	0.050167654	Herpes zoster without mention of complication	3		
0543	0.044095253	Herpetic meningoencephalitis	3		
0661	0.044863253	Tick-borne fever	3		
0793	0.0516149	Rhinovirus infection in conditions classified elsewhere and of unspecified site	3		
07999	0.067862371	Unspecified viral infection	3		
6822	0.033547018	Cellulitis and abscess of trunk	3		
6823	0.047701025	Cellulitis and abscess of upper arm and forearm	3		
6824	0.071059465	Cellulitis and abscess of hand, except fingers and thumb	3		
6826	0.414483075	Cellulitis and abscess of leg, except foot	3		
6827	0.197071625	Cellulitis and abscess of foot, except toes	3		
73028	0.032192514	Unspecified osteomyelitis, other specified sites	3		
7907	0.1004461	Bacteremia	3		
99590	0.064159295	Systemic inflammatory response syndrome, unspecified	3		
99859	0.398145309	Other postoperative infection	3		
99932	0.027880896	Bloodstream infection due to central venous catheter	3		
99939	0.027880896	Infection following other infusion, injection, transfusion, or vaccination	3		
51881	0.904220487	Acute respiratory failure	4	A	
51884	0.30206047	Acute and chronic respiratory failure	4	A	
4660	0.119489831	Acute bronchitis	4	B	
490	0.031133585	Bronchitis, not specified as acute or chronic	4	B	

4911	0.037918132	Mucopurulent chronic bronchitis	4	B	
49121	1.007818794	Obstructive chronic bronchitis with (acute) exacerbation	4	B	
49122	0.200429898	Obstructive chronic bronchitis with acute bronchitis	4	B	
49322	0.432527281	Chronic obstructive asthma with (acute) exacerbation	4	B	
49390	0.03382659	Asthma, unspecified type, unspecified	4	B	
49392	0.156725202	Asthma, unspecified type, with (acute) exacerbation	4	B	
4809	0.033810897	Viral pneumonia, unspecified	4	C	
4820	0.042466195	Pneumonia due to Klebsiella pneumoniae	4	C	
48230	0.031710177	Pneumonia due to Streptococcus, unspecified	4	C	
48242	0.186079378	Methicillin resistant pneumonia due to Staphylococcus aureus	4	C	
48283	0.102271255	Pneumonia due to other gram-negative bacteria	4	C	
4829	0.047701025	Bacterial pneumonia, unspecified	4	C	
486	2.333631459	Pneumonia, organism unspecified	4	C	
5070	0.559543833	Pneumonitis due to inhalation of food or vomitus	4	C	
51633	0.031296026	Acute interstitial pneumonitis	4	C	
32723	0.040981343	Obstructive sleep apnea (adult)(pediatric)	4	D	
4150	0.035591102	Acute cor pulmonale	4	D	
4659	0.081715137	Acute upper respiratory infections of unspecified site	4	D	
5109	0.065545324	Empyema without mention of fistula	4	D	
5110	0.041485512	Pleurisy without mention of effusion or current tuberculosis	4	D	
51189	0.095655552	Other specified forms of effusion, except tuberculous	4	D	
5119	0.537196926	Unspecified pleural effusion	4	D	
514	0.057237841	Pulmonary congestion and hypostasis	4	D	
515	0.028361163	Postinflammatory pulmonary fibrosis	4	D	
5183	0.030836915	Pulmonary eosinophilia	4	D	
5184	0.217591729	Acute edema of lung, unspecified	4	D	
51852	0.036543736	Other pulmonary insufficiency, not elsewhere classified, following trauma and surgery	4	D	
5194	0.045103098	Disorders of diaphragm	4	D	
78605	0.093646015	Shortness of breath	4	D	
78609	0.179128612	Other respiratory abnormalities	4	D	
78652	0.13635189	Painful respiration	4	D	

4552	0.079089259	Internal hemorrhoids with other complication	5		
4555	0.034927084	External hemorrhoids with other complication	5		
4558	0.035400427	Unspecified hemorrhoids with other complication	5		
5300	0.03429958	Achalasia and cardiospasm	5		
53010	0.037688781	Esophagitis, unspecified	5		
53020	0.037726816	Ulcer of esophagus without bleeding	5		
5305	0.033961848	Dyskinesia of esophagus	5		
53081	0.120317353	Esophageal reflux	5		
53500	0.021697154	Acute gastritis, without mention of hemorrhage	5		
53540	0.04773753	Other specified gastritis, without mention of hemorrhage	5		
53550	0.085236534	Unspecified gastritis and gastroduodenitis, without mention of hemorrhage	5		
5362	0.040605186	Persistent vomiting	5		
5363	0.077237622	Gastroparesis	5		
53649	0.110842444	Other gastrostomy complications	5		
5370	0.033891362	Acquired hypertrophic pyloric stenosis	5		
5401	0.027555853	Acute appendicitis with peritoneal abscess	5		
5409	0.069454787	Acute appendicitis without mention of peritonitis	5		
5570	0.035187293	Acute vascular insufficiency of intestine	5		
5571	0.043037227	Chronic vascular insufficiency of intestine	5		
5579	0.062463597	Unspecified vascular insufficiency of intestine	5		
5589	0.309256991	Other and unspecified noninfectious gastroenteritis and colitis	5		
5601	0.147820637	Paralytic ileus	5		
56031	0.036743359	Gallstone ileus	5		
56081	0.083051367	Intestinal or peritoneal adhesions with obstruction (postoperative) (postinfection)	5		
56089	0.030973468	Other specified intestinal obstruction	5		
5609	0.265916124	Unspecified intestinal obstruction	5		
56211	0.139142022	Diverticulitis of colon (without mention of hemorrhage)	5		
56400	0.029321478	Constipation, unspecified	5		
5641	0.079811627	Irritable bowel syndrome	5		
5680	0.037603377	Peritoneal adhesions (postoperative) (postinfection)	5		
56949	0.05389285	Other specified disorders of rectum and anus	5		

5715	0.043118798	Cirrhosis of liver without mention of alcohol	5		
5722	0.034414162	Hepatic encephalopathy	5		
5724	0.068828325	Hepatorenal syndrome	5		
5728	0.054172783	Other sequelae of chronic liver disease	5		
57400	0.2155727	Calculus of gallbladder with acute cholecystitis, without mention of obstruction	5		
57410	0.064583009	Calculus of gallbladder with other cholecystitis, without mention of obstruction	5		
57420	0.179200229	Calculus of gallbladder without mention of cholecystitis, without mention of obstruction	5		
57470	0.03382659	Calculus of gallbladder and bile duct with other cholecystitis, without mention of obstruction	5		
57471	0.059519738	Calculus of gallbladder and bile duct with other cholecystitis, with obstruction	5		
5750	0.029322026	Acute cholecystitis	5		
57511	0.03602405	Chronic cholecystitis	5		
5761	0.08881793	Cholangitis	5		
5770	0.097442803	Acute pancreatitis	5		
5772	0.037170094	Cyst and pseudocyst of pancreas	5		
78701	0.138658277	Nausea with vomiting	5		
78720	0.034534223	Dysphagia, unspecified	5		
78901	0.047472853	Abdominal pain, right upper quadrant	5		
78902	0.03156901	Abdominal pain, left upper quadrant	5		
78903	0.041525683	Abdominal pain, right lower quadrant	5		
78906	0.076071189	Abdominal pain, epigastric	5		
78907	0.032770678	Abdominal pain, generalized	5		
9974	0.101136723	Digestive system complications not elsewhere classified	5		
43310	0.105392098	Occlusion and stenosis of carotid artery without mention of cerebral infarction	6	A	
43311	0.030918355	Occlusion and stenosis of carotid artery with cerebral infarction	6	A	
43400	0.030707648	Cerebral thrombosis without mention of cerebral infarction	6	A	
43411	0.335369469	Cerebral embolism with cerebral infarction	6	A	

43491	0.746265614	Cerebral artery occlusion, unspecified with cerebral infarction	6	A	
4358	0.036957879	Other specified transient cerebral ischemias	6	A	
4359	0.393311458	Unspecified transient cerebral ischemia	6	A	
4370	0.036319939	Cerebral atherosclerosis	6	A	
4371	0.026746486	Other generalized ischemic cerebrovascular disease	6	A	
3310	0.044514645	Alzheimer's disease	6	B	
33182	0.028690747	Dementia with lewy bodies	6	B	
33812	0.043683596	Acute post-thoracotomy pain	6	B	
33818	0.064616751	Other acute postoperative pain	6	B	
3383	0.090928611	Neoplasm related pain (acute) (chronic)	6	B	
34580	0.043683596	Other forms of epilepsy and recurrent seizures, without mention of intractable epilepsy	6	B	
34670	0.059536091	Chronic migraine without aura, without mention of intractable migraine without mention of status migrainosus	6	B	
34680	0.074781498	Other forms of migraine, without mention of intractable migraine without mention of status migrainosus	6	B	
34690	0.032876335	Migraine, unspecified, without mention of intractable migraine without mention of status migrainosus	6	B	
34691	0.096204821	Migraine, unspecified, with intractable migraine, so stated, without mention of status migrainosus	6	B	
3481	0.035219496	Anoxic brain damage	6	B	
34839	0.041129069	Other encephalopathy	6	B	
34982	0.034637112	Toxic encephalopathy	6	B	
3558	0.050478338	Mononeuritis of lower limb, unspecified	6	B	
3576	0.044290526	Polyneuropathy due to drugs	6	B	
35801	0.033329086	Myasthenia gravis with (acute) exacerbation	6	B	
4377	0.033675355	Transient global amnesia	6	B	
4378	0.039508945	Other ill-defined cerebrovascular disease	6	B	
7840	0.041525683	Headache	6	B	
2760	0.026992469	Hyperosmolality and/or hypernatremia	7	A	
2761	0.461781548	Hyposmolality and/or hyponatremia	7	A	
2768	0.080620155	Hypopotassemia	7	A	

40390	0.041734355	Hypertensive chronic kidney disease, unspecified, with chronic kidney disease stage I through stage IV, or unspecified	7	B	
40391	0.062582136	Hypertensive chronic kidney disease, unspecified, with chronic kidney disease stage V or end stage renal disease	7	B	
5845	0.032095094	Acute kidney failure with lesion of tubular necrosis	7	B	
5849	1.376463572	Acute kidney failure, unspecified	7	B	
5856	0.045761995	End stage renal disease	7	B	
59080	0.034633306	Pyelonephritis, unspecified	7	C	
5921	0.190413053	Calculus of ureter	7	C	
59582	0.03429958	Irradiation cystitis	7	C	
5960	0.038429877	Bladder neck obstruction	7	C	
5990	0.780458415	Urinary tract infection, site not specified	7	C	
60000	0.093730942	Hypertrophy (benign) of prostate without urinary obstruction and other lower urinary tract symptom (LUTS)	7	C	
60001	0.056698669	Hypertrophy (benign) of prostate with urinary obstruction and other lower urinary tract symptoms (LUTS)	7	C	
6010	0.063711906	Acute prostatitis	7	C	
99631	0.149341225	Mechanical complication due to urethral (indwelling) catheter	7	C	
99664	0.360724716	Infection and inflammatory reaction due to indwelling urinary catheter	7	C	
99673	0.048760876	Other complications due to renal dialysis device, implant, and graft	7	C	
99676	0.09711838	Other complications due to genitourinary device, implant, and graft	7	C	
99732	0.043192692	Postprocedural aspiration pneumonia	7	C	
99739	0.305984797	Other respiratory complications	7	C	
9975	0.064080037	Urinary complications, not elsewhere classified	7	C	
2800	0.066072314	Iron deficiency anemia secondary to blood loss (chronic)	8	A	
28319	0.040126469	Other non-autoimmune hemolytic anemias	8	A	
2851	0.295336865	Acute posthemorrhagic anemia	8	A	
28521	0.067899314	Anemia in chronic kidney disease	8	A	
28522	0.035187529	Anemia in neoplastic disease	8	A	
28529	0.050053851	Anemia of other chronic disease	8	A	
2859	0.111928606	Anemia, unspecified	8	A	

28659	0.038349867	Other hemorrhagic disorder due to intrinsic circulating anticoagulants, antibodies, or inhibitors	8	B	
28981	0.031649436	Primary hypercoagulable state	8	B	
79092	0.23173945	Abnormal coagulation profile	8	B	
73382	0.026767595	Nonunion of fracture	9		
8052	0.062096879	Closed fracture of dorsal [thoracic] vertebra without mention of spinal cord injury	9		
8056	0.070085066	Closed fracture of sacrum and coccyx without mention of spinal cord injury	9		
80703	0.03285072	Closed fracture of three ribs	9		
80705	0.043421188	Closed fracture of five ribs	9		
82009	0.09346889	Other closed transcervical fracture of neck of femur	9		
8208	0.066267912	Closed fracture of unspecified part of neck of femur	9		
82535	0.032858098	Open fracture of metatarsal bone(s)	9		
8488	0.035126602	Other specified sites of sprains and strains	9		
85011	0.039508945	Concussion, with loss of consciousness of 30 minutes or less	9		
8604	0.033329086	Traumatic pneumothorax without mention of open wound into thorax	9		
8670	0.157967689	Injury to bladder and urethra, without mention of open wound into cavity	9		
87211	0.034152958	Open wound of auricle, ear, complicated	9		
8911	0.046990975	Open wound of knee, leg [except thigh], and ankle, complicated	9		
9222	0.034534223	Contusion of abdominal wall	9		
9551	0.041597922	Injury to median nerve	9		
9623	0.121369637	Poisoning by insulins and antidiabetic agents	9		
9642	0.041437884	Poisoning by anticoagulants	9		
96509	0.032770678	Poisoning by other opiates and related narcotics	9		
25012	0.034981461	Diabetes with ketoacidosis, type II or unspecified type, uncontrolled	10	A	
25060	0.091439456	Diabetes with neurological manifestations, type II or unspecified type, not stated as uncontrolled	10	A	
25062	0.043161113	Diabetes with neurological manifestations, type II or unspecified type, uncontrolled	10	A	
25080	0.136130499	Diabetes with other specified manifestations, type II or unspecified type, not stated as uncontrolled	10	A	
2449	0.079142849	Unspecified acquired hypothyroidism	10	B	

2536	0.125701116	Other disorders of neurohypophysis	10	B	
1532	0.039648458	Malignant neoplasm of descending colon	11		
1533	0.034395416	Malignant neoplasm of sigmoid colon	11		
1539	0.038252283	Malignant neoplasm of colon, unspecified site	11		
1622	0.075252606	Malignant neoplasm of main bronchus	11		
1623	0.108874178	Malignant neoplasm of upper lobe, bronchus or lung	11		
1625	0.037170094	Malignant neoplasm of lower lobe, bronchus or lung	11		
1629	0.143461262	Malignant neoplasm of bronchus and lung, unspecified	11		
1890	0.102601811	Malignant neoplasm of kidney, except pelvis	11		
1970	0.043084307	Secondary malignant neoplasm of lung	11		
1972	0.04671944	Secondary malignant neoplasm of pleura	11		
1983	0.033569521	Secondary malignant neoplasm of brain and spinal cord	11		
1985	0.034395416	Secondary malignant neoplasm of bone and bone marrow	11		
20288	0.06081691	Other malignant lymphomas, lymph nodes of multiple sites	11		
20300	0.062961862	Multiple myeloma, without mention of having achieved remission	11		
2111	0.040782909	Benign neoplasm of stomach	11		
5307	0.043808758	Gastroesophageal laceration-hemorrhage syndrome	12	A	
53140	0.107888291	Chronic or unspecified gastric ulcer with hemorrhage, without mention of obstruction	12	A	
53240	0.072551438	Chronic or unspecified duodenal ulcer with hemorrhage, without mention of obstruction	12	A	
53541	0.030628212	Other specified gastritis, with hemorrhage	12	A	
56212	0.069517126	Diverticulosis of colon with hemorrhage	12	A	
56881	0.083642412	Hemoperitoneum (nontraumatic)	12	A	
5693	0.221288249	Hemorrhage of rectum and anus	12	A	
5781	0.28634984	Blood in stool	12	A	
5789	0.582024443	Hemorrhage of gastrointestinal tract, unspecified	12	A	
430	0.050949514	Subarachnoid hemorrhage	12	B	I
431	0.157566381	Intracerebral hemorrhage	12	B	I
4321	0.198824219	Subdural hemorrhage	12	B	I
4329	0.027142427	Unspecified intracranial hemorrhage	12	B	I

80422	0.035171089	Closed fractures involving skull or face with other bones with subarachnoid, subdural, and extradural hemorrhage, with brief [less than one hour] loss of consciousness	12	B	II
85300	0.067691448	Other and unspecified intracranial hemorrhage following injury without mention of open intracranial wound, unspecified state of consciousness	12	B	II
85301	0.028349335	Other and unspecified intracranial hemorrhage following injury without mention of open intracranial wound, with no loss of consciousness	12	B	II
56985	0.082729773	Angiodysplasia of intestine with hemorrhage	12	C	
56986	0.034633306	Dieulafoy lesion (hemorrhagic) of intestine	12	C	
59971	0.235147052	Gross hematuria	12	C	
78630	0.032858098	Hemoptysis, unspecified	12	C	
99811	0.254061285	Hemorrhage complicating a procedure	12	C	
99812	2.737450179	Hematoma complicating a procedure	12	C	
2910	0.038349867	Alcohol withdrawal delirium	13		
29181	0.036599415	Alcohol withdrawal	13		
2920	0.034027752	Drug withdrawal	13		
29572	0.02084305	Schizoaffective disorder, chronic	13		
29620	0.066476957	Major depressive affective disorder, single episode, unspecified	13		
29630	0.033808789	Major depressive affective disorder, recurrent episode, unspecified	13		
29632	0.033552959	Major depressive affective disorder, recurrent episode, moderate	13		
29633	0.065923574	Major depressive affective disorder, recurrent episode, severe, without mention of psychotic behavior	13		
29636	0.025254546	Major depressive affective disorder, recurrent episode, in full remission	13		
29650	0.059849008	Bipolar I disorder, most recent episode (or current) depressed, unspecified	13		
2989	0.03214524	Unspecified psychosis	13		
30000	0.03841689	Anxiety state, unspecified	13		
30300	0.052296384	Acute alcoholic intoxication in alcoholism, unspecified	13		
30390	0.038349867	Other and unspecified alcohol dependence, unspecified	13		
41511	0.136076819	Iatrogenic pulmonary embolism and infarction	14		
41519	0.505217556	Other pulmonary embolism and infarction	14		
45340	0.187089885	Acute venous embolism and thrombosis of unspecified deep vessels of lower extremity	14		

45341	0.430114737	Acute venous embolism and thrombosis of deep vessels of proximal lower extremity	14		
45381	0.03602405	Acute venous embolism and thrombosis of superficial veins of upper extremity	14		
135	0.038630829	Sarcoidosis	15		
27400	0.067220235	Gouty arthropathy, unspecified	15		
27651	0.150984627	Dehydration	15		
27661	0.05092794	Transfusion associated circulatory overload	15		
27669	0.180219455	Other fluid overload	15		
35979	0.033961848	Other inflammatory and immune myopathies, NEC	15		
3693	0.048822073	Unqualified visual loss, both eyes	15		
38610	0.020536157	Peripheral vertigo, unspecified	15		
38611	0.066706433	Benign paroxysmal positional vertigo	15		
4568	0.02910206	Varices of other sites	15		
55221	0.036986437	Incisional ventral hernia with obstruction	15		
6273	0.042466195	Postmenopausal atrophic vaginitis	15		
70714	0.038374405	Ulcer of heel and midfoot	15		
7092	0.037952501	Scar conditions and fibrosis of skin	15		
7093	0.033675355	Degenerative skin disorders	15		
7098	0.034086681	Other specified disorders of skin	15		
71535	0.031282521	Osteoarthritis, localized, not specified whether primary or secondary, pelvic region and thigh	15		
71538	0.039531625	Osteoarthritis, localized, not specified whether primary or secondary, other specified sites	15		
7210	0.059519738	Cervical spondylosis without myelopathy	15		
7211	0.068376688	Cervical spondylosis with myelopathy	15		
7213	0.030242692	Lumbosacral spondylosis without myelopathy	15		
72252	0.04773753	Degeneration of lumbar or lumbosacral intervertebral disc	15		
72400	0.037952501	Spinal stenosis, unspecified region	15		
72402	0.034279553	Spinal stenosis, lumbar region, without neurogenic claudication	15		
7242	0.034954273	Lumbago	15		
7244	0.040925615	Thoracic or lumbosacral neuritis or radiculitis, unspecified	15		

72886	0.040605186	Necrotizing fasciitis	15		
72889	0.088572249	Other disorders of muscle, ligament, and fascia	15		
7292	0.035613299	Neuralgia, neuritis, and radiculitis, unspecified	15		
72989	0.05885991	Other musculoskeletal symptoms referable to limbs	15		
72992	0.063562323	Nontraumatic hematoma of soft tissue	15		
73679	0.038265782	Other acquired deformities of ankle and foot	15		
78060	0.213641336	Fever, unspecified	15		
78064	0.036960592	Chills (without fever)	15		
78079	0.384644277	Other malaise and fatigue	15		
7837	0.032664138	Adult failure to thrive	15		
7905	0.099084021	Other nonspecific abnormal serum enzyme levels	15		
9352	0.027087186	Foreign body in stomach	15		
99641	0.044764055	Mechanical loosening of prosthetic joint	15		
99642	0.026767595	Dislocation of prosthetic joint	15		
99659	0.05707582	Mechanical complication due to other implant and internal device, not elsewhere classified	15		
99666	0.067364983	Infection and inflammatory reaction due to internal joint prosthesis	15		
99799	0.053339436	Complications affecting other specified body systems, not elsewhere classified	15		
99809	0.027978656	Postoperative shock, other	15		
9982	0.047557017	Accidental puncture or laceration during a procedure, not elsewhere classified	15		
99851	0.03429958	Infected postoperative seroma	15		
9986	0.200654069	Persistent postoperative fistula	15		
99883	0.035816844	Non-healing surgical wound	15		
99889	0.210472812	Other specified complications of procedures not elsewhere classified	15		
V0382	0.040782909	Other specified vaccinations against streptococcus pneumoniae [pneumococcus]	15		
V5331	0.03285072	Fitting and adjustment of cardiac pacemaker	15		
V5789	0.155503424	Care involving other specified rehabilitation procedure	15		
V5811	0.06081691	Encounter for antineoplastic chemotherapy	15		
V5812	0.06081691	Encounter for antineoplastic immunotherapy	15		

Table S3. ICD 9 codes used to identify co morbidities.

Co-morbidities	ICD 9 CM diagnosis codes
Obstructive sleep apnea	327.23
Heart failure	402.01/11/91, 404.01/03/11/91/93, 428
Coronary artery disease	410-414, V45.82
Chronic kidney disease (Stage 3 or more)	585.3/4/5/6, V45.11, 39.95(procedural code)
Prior coronary artery bypass graft	V45.81
Hyperthyroidism	242
Mitral valve disease	424.0
Prior Stroke/TIA	438, V12.54
Co morbidities were identified using above ICD 9 codes in secondary diagnosis field	

Table S4. Deyo's modification of Charlson's co-morbidity index (CCI).

Reported ICD-9 CM Codes	Condition	Charlson Score
410 – 410.9	Myocardial infarction	1
428 – 428.9	Congestive heart failure	1
433.9, 441 – 441.9, 785.4, V43.4	Peripheral vascular disease	1
430 – 438	Cerebrovascular disease	1
290 – 290.9	Dementia	1
490 – 496, 500 – 505, 506.4	Chronic pulmonary disease	1
710.0, 710.1, 710.4, 714.0 – 714.2, 714.81, 725	Rheumatologic disease	1
531 – 534.9	Peptic ulcer disease	1
571.2, 571.5, 571.6, 571.4 – 571.49	Mild liver disease	1
250 – 250.3, 250.7	Diabetes	1
250.4 – 250.6	Diabetes with chronic complications	2
344.1, 342 – 342.9	Hemiplegia or paraplegia	2
582 – 582.9, 583 – 583.7, 585, 586, 588 – 588.9	Renal disease	2
140-172.9, 174-195.8, 200-208.9	Any malignancy including leukemia and lymphoma	2
572.2 – 572.8	Moderate or severe liver disease	3
196 -199.1	Metastatic solid tumor	6
042 – 044.9	AIDS	6

Table S5. Multivariate analysis of utilization of catheter ablation for atrial fibrillation.

	Multivariate of catheter ablation in atrial fibrillation			
	OR	LL	UL	P-value
Age (continuous variable) ^π	0.97	0.97	0.98	<0.001
Age groups				
18-49	Referent	Referent	Referent	
50-64	1.06	0.99	1.13	<0.001
65-79	0.82	0.76	0.89	<0.001
>=80	0.27	0.24	0.29	<0.001
Sex				
Male	Referent	Referent	Referent	
Female	0.76	0.73	0.78	<0.001
Comorbidities				
Obesity [§]	0.77	0.73	0.81	<0.001
Obstructive sleep apnea ^α	1.17	1.10	1.24	<0.001
Hypertension [§]	0.88	0.85	0.91	<0.001
Diabetes [§]	0.82	0.78	0.86	<0.001
Heart failure [@]	0.72	0.69	0.76	<0.001
Coronary artery disease ^β	0.87	0.84	0.91	<0.001
Chronic pulmonary disease [§]	0.87	0.83	0.92	<0.001
Chronic kidney disease [∞] (stage 3 more more)	0.76	0.69	0.84	<0.001
Prior coronary artery bypass graft [@]	0.93	0.86	1.01	0.072
Hyperthyroidism ^Ω	0.51	0.42	0.61	<0.001
Alcohol abuse [§]	0.28	0.24	0.32	<0.001
Mitral valve disease ^μ	0.89	0.84	0.95	0.001
Prior stroke/Transient ischemic attack [©]	0.91	0.85	0.98	0.007

Vascular Disease history [§]	0.99	0.91	1.07	0.682
Anemia [§]	0.77	0.72	0.84	<0.001
Median household income category for patient's zip code #				
1. 0-25th percentile	Referent	Referent	Referent	
2. 26-50th percentile	1.33	1.26	1.40	0.002
3. 51-75th percentile	1.48	1.40	1.56	<0.001
4. 76-100th percentile	1.92	1.82	2.02	<0.001
Primary Payer				
Medicare	Referent	Referent	Referent	
Medicaid	0.72	0.64	0.80	0.003
Private including health maintenance organization	1.11	1.05	1.17	<0.001
Self-pay/no charge/other	0.53	0.47	0.59	<0.001
Hospital characteristics				
Hospital bed size [‡]				
Small	Referent	Referent	Referent	
Medium	2.84	2.59	3.11	<0.001
Large	4.64	4.26	5.06	<0.001
Hospital teaching status[§]				
Non-teaching	Referent	Referent	Referent	
Teaching	2.90	2.79	3.01	<0.001
Admission type				
Non-elective	Referent	Referent	Referent	
Elective	17.48	16.85	18.14	<0.001
Admission day				
Weekdays	Referent	Referent	Referent	
Weekend	0.29	0.27	0.32	<0.001

§: Variables are AHRQ co-morbidity measures.

||: Charlson/Deyo Co-morbidity index (CCI) was calculated as per Deyo classification.

#: Represents a quartile classification of the estimated median household income of residents in the patients ZIP Code, derived from ZIP Code-demographic data obtained from Claritas. The quartiles are identified by values of 1 to 4, indicating the poorest to wealthiest populations. Because these estimates are updated annually, the value ranges vary by year. https://www.hcup-us.ahrq.gov/db/vars/zipinc_qrtl/nrdnote.jsp

@: Heart failure is identified by ICD 9 codes in secondary diagnosis field and it includes systolic, diastolic and combined heart failure.

£: The bed size cutoff points divided into small, medium, and large have been done so that approximately one-third of the hospitals in a given region, location, and teaching status combination would fall within each bed size category. https://www.hcup-us.ahrq.gov/db/vars/hosp_bedsiz/nrdnote.jsp

\$: A hospital is considered to be a teaching hospital if it has an AMA-approved residency program, is a member of the Council of Teaching Hospitals (COTH) or has a ratio of full-time equivalent interns and residents to beds of 0.25 or higher. https://www.hcup-us.ahrq.gov/db/vars/hosp_ur_teach/nrdnote.jsp

α, β, ∞, ®, Ω, μ, ©: co-morbidities were identified by appropriate ICD 9 CM diagnosis codes in secondary diagnosis field (Table S3)

Table S6. Baseline characteristics of patients of catheter ablation in atrial fibrillation with and without atrial fibrillation recurrence.

	Atrial Fibrillation Recurrence		Overall	p-value
	No	Yes		
Index admission	35396(94.7%)	1964(5.3%)	37360	
Patient level variables				
Age (%)	65(57-71)	68(60-74)	65(57-72)	<0.001
18-49	10.3	8.1	10.2	
50-64	37.4	35.0	37.3	
65-79	45.0	50.2	45.3	
>=80	7.3	6.7	7.2	
Sex (%)				<0.001
Male	64.6	56.6	64.2	
Female	35.4	43.4	35.8	
Charlson co-morbidity index (%)				<0.001
0	58.2	52.2	57.9	
1	24.5	29.5	24.8	
>=2	17.3	18.3	17.4	
Comorbidities (%)				
Obesity [§]	15.1	19.3	15.3	<0.001
Obstructive sleep apnea ^α	14.3	12.9	14.2	0.078
Hypertension [§]	62.6	65.8	62.8	0.004
Diabetes [§]	18.7	24.6	19.0	<0.001
Heart failure [@]	15.9	15.4	15.9	0.613
Coronary artery disease ^β	25.1	26.4	25.2	0.209
Chronic pulmonary disease [§]	14.0	17.5	14.2	<0.001

Chronic kidney disease ^o (stage 3 more more)	3.3	2.3	3.3	0.015
Prior coronary artery bypass graft [®]	5.3	5.1	5.3	0.788
Hyperthyroidism ^Ω	0.8	0.4	0.8	0.044
Alcohol abuse [§]	1.1	0.4	1.1	0.002
Mitral Valve disease ^μ	7.8	8.9	7.9	0.066
Prior stroke/Transient ischemic attack [©]	6.6	6.7	6.6	0.879
Vascular Disease history [§]	4.6	3.9	4.6	0.110
Anemia [§]	5.1	7.0	5.2	<0.001
Median household income category for patient's zip code # (%)				<0.001
1. 0-25th percentile	18.4	19.1	18.4	
2. 26-50th percentile	22.2	26.9	22.4	
3. 51-75th percentile	26.6	25.4	26.5	
4. 76-100th percentile	31.1	26.6	30.9	
Primary Payer (%)				<0.001
Medicare	51.7	57.2	52.0	
Medicaid	2.6	4.2	2.7	
Private including health maintenance organization	42.7	35.7	42.3	
Self-pay/no charge/other	3.0	2.9	3.0	
Hospital characteristics				
Hospital bed size [£] (%)				<0.001
Small	3.4	4.1	3.5	
Medium	17.5	21.2	17.7	
Large	79.1	74.7	78.9	
Hospital teaching status [§] (%)				0.230
Non-teaching	25.2	24.0	25.1	

Teaching	74.8	76.0	74.9	
Hospital Volume (%)				0.023
<50	45.6	47.1	45.9	
50 to 100	24.5	25.8	24.5	
>100	30.0	27.1	29.9	
Admission type (%)				<0.001
Non-elective	29.7	33.9	29.9	
Elective	70.3	66.1	70.1	
Admission day (%)				0.130
Weekdays	96.2	95.6	96.2	
Weekend	3.8	4.5	3.8	
Disposition (%)				0.011
Home	97.9	98.8	97.9	
Facility/others	1.9	1.1	1.8	
In hospital Mortality (%)	0.2	0.0	0.1	0.084
Length of stay (Median, IQR) days	1(1-2)	2(1-4)	1(1-3)	<0.001
Cost of hospitalization (Median, IQR) USD \$	23581(17282-30209)	22318(15235-30314)	23414(17004-30220)	<0.001

§: Variables are AHRQ co-morbidity measures.

||: Charlson/Deyo Co-morbidity index (CCI) was calculated as per Deyo classification.

#: Represents a quartile classification of the estimated median household income of residents in the patients ZIP Code, derived from ZIP Code-demographic data obtained from Claritas. The quartiles are identified by values of 1 to 4, indicating the poorest to wealthiest populations. Because these estimates are updated annually, the value ranges vary by year. https://www.hcup-us.ahrq.gov/db/vars/zipinc_qrtl/nrdnote.jsp

@: Heart failure is identified by ICD 9 codes in secondary diagnosis field and it includes systolic, diastolic and combined heart failure.

£: The bed size cutoff points divided into small, medium, and large have been done so that approximately one-third of the hospitals in a given region, location, and teaching status combination would fall within each bed size category. https://www.hcup-us.ahrq.gov/db/vars/hosp_bedsiz/nrdnote.jsp

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α, β, ∞, ®, Ω, μ, ©: co-morbidities were identified by appropriate ICD 9 CM diagnosis codes in secondary diagnosis field (Table S3)

Table S7. Multivariate analysis of 30 and 90-day readmission in atrial fibrillation patients.

	30-day readmission				90-day readmission			
	HR	LL	UL	p-value	HR	LL	UL	p-value
Age (continuous variable)^π	1.01	1.01	1.01	<0.001	1.01	1.01	1.01	<0.001
Age group								
18-49	Referent	Referent	Referent		Referent	Referent	Referent	
50-64	1.34	1.29	1.40	<0.001	1.29	1.25	1.33	<0.001
65-79	1.26	1.20	1.32	<0.001	1.20	1.16	1.25	<0.001
>=80	1.36	1.29	1.43	<0.001	1.29	1.24	1.34	<0.001
Sex								
Male	Referent	Referent	Referent		Referent	Referent	Referent	
Female	1.10	1.08	1.12	<0.001	1.10	1.09	1.12	<0.001
Catheter ablation of atrial fibrillation	1.02	0.97	1.07	0.423	0.89	0.86	0.93	<0.001
Charlson co-morbidity index								
0	Referent	Referent	Referent		Referent	Referent	Referent	
1	1.25	1.22	1.28	<0.001	1.22	1.20	1.24	<0.001
>=2	1.64	1.60	1.70	<0.001	1.53	1.49	1.56	<0.001
Comorbidities								
Obesity [§]	0.93	0.91	0.95	<0.001	0.96	0.95	0.98	<0.001
Obstructive sleep apnea ^α	0.99	0.96	1.02	0.498	1.01	0.99	1.04	0.384
Hypertension [§]	0.99	0.97	1.00	0.106	0.99	0.98	1.00	0.249
Diabetes [§]	1.04	1.02	1.06	<0.001	1.03	1.02	1.05	<0.001
Heart failure [@]	1.14	1.12	1.16	<0.001	1.13	1.12	1.15	<0.001

Non-teaching	Referent	Referent	Referent		Referent	Referent	Referent	
Teaching	1.03	1.01	1.05	<0.001	1.03	1.02	1.04	<0.001
Hospital bed size [£]								
Small	Referent	Referent	Referent		Referent	Referent	Referent	
Medium	1.01	0.98	1.03	0.740	1.01	0.99	1.03	0.594
Large	1.00	0.98	1.03	0.727	1.01	0.99	1.03	0.269
Admission type								
Non-elective	Referent	Referent	Referent		Referent	Referent	Referent	
Elective	0.88	0.86	0.91	<0.001	0.92	0.90	0.94	<0.001
Admission day								
Weekdays	Referent	Referent	Referent		Referent	Referent	Referent	
Weekend	1.01	0.99	1.02	0.595	0.99	0.98	1.01	0.341
Disposition								
Home	Referent	Referent	Referent		Referent	Referent	Referent	
Facility/others	1.22	1.19	1.25	<0.001	1.19	1.17	1.21	<0.001
Length of stay (days)								
1	Referent	Referent	Referent		Referent	Referent	Referent	
2 to 3	1.20	1.18	1.23	<0.001	1.19	1.17	1.21	<0.001
>3	1.53	1.50	1.57	<0.001	1.45	1.43	1.47	<0.001

§: Variables are AHRQ co-morbidity measures.

||: Charlson/Deyo Co-morbidity index (CCI) was calculated as per Deyo classification.

#: Represents a quartile classification of the estimated median household income of residents in the patients ZIP Code, derived from ZIP Code-demographic data obtained from Claritas. The quartiles are identified by values of 1 to 4, indicating the poorest to wealthiest populations. Because these estimates are updated annually, the value ranges vary by year. https://www.hcup-us.ahrq.gov/db/vars/zipinc_qrtl/nrdnote.jsp

@: Heart failure is identified by ICD 9 codes in secondary diagnosis field and it includes systolic, diastolic and combined heart failure.

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\$. A hospital is considered to be a teaching hospital if it has an AMA-approved residency program, is a member of the Council of Teaching Hospitals (COTH) or has a ratio of full-time equivalent interns and residents to beds of 0.25 or higher. https://www.hcup-us.ahrq.gov/db/vars/hosp_ur_teach/nrdnote.jsp; α , β , ∞ , \otimes , Ω , μ , \odot : co-morbidities were identified by appropriate ICD 9 CM diagnosis codes in secondary diagnosis field (Table S3)

Table S8. Impact of catheter ablation on 90-day readmission in different subgroups of atrial fibrillations.

Subgroups	Sub group analysis of 90-day readmission			
	HR	LL	HL	p-value
Age				
18-49	1.04	0.88	1.22	0.638
50-64	0.83	0.77	0.89	<0.001
65-79	0.89	0.84	0.95	<0.001
>=80	1.00	0.90	1.11	0.927
Sex				
Male	0.87	0.83	0.92	<0.001
Female	0.91	0.85	0.96	0.001
Charlson co-morbidity index 				
0	0.91	0.85	0.97	0.003
1	0.93	0.86	1.01	0.066
>=2	0.85	0.80	0.92	<0.001
Comorbidities				
Obesity [§]	0.99	0.90	1.10	0.875
Obstructive sleep apnea ^α	0.87	0.77	0.98	0.019
Hypertension [§]	0.88	0.84	0.93	<0.001
Diabetes [§]	0.92	0.85	0.99	0.035
Heart failure [@]	0.90	0.83	0.97	0.004
Coronary artery disease ^β	0.89	0.83	0.95	0.001
Chronic pulmonary disease [§]	0.91	0.84	1.00	0.037
Chronic kidney disease [∞] (stage 3 more more)	0.94	0.81	1.08	0.366
Prior coronary artery bypass graft [®]	0.82	0.71	0.94	0.006
Hyperthyroidism ^Ω	1.01	0.67	1.52	0.975
Alcohol abuse [§]	0.73	0.51	1.05	0.094
Mitral Valve disease ^μ	0.86	0.76	0.98	0.025

Prior stroke/Transient ischemic attack [©]	0.90	0.79	1.03	0.122
Vascular Disease history [§]	0.81	0.69	0.94	0.005
Anemia [§]	0.87	0.77	0.98	0.023
Median household income category for patient's zip code #				
1. 0-25th percentile	0.87	0.80	0.95	0.001
2. 26-50th percentile	0.88	0.81	0.95	0.002
3. 51-75th percentile	0.90	0.83	0.98	0.013
4. 76-100th percentile	0.88	0.82	0.96	0.002
Primary Payer				
Medicare	0.96	0.93	0.99	0.025
Medicaid	0.84	0.73	0.97	0.019
Private including health maintenance organization	0.85	0.78	0.92	<0.001
Self-pay/no charge/other	0.96	0.76	1.23	0.765
Hospital characteristics				
Hospital bed size [£]				
Small	0.92	0.76	1.12	0.401
Medium	0.83	0.75	0.91	<0.001
Large	0.89	0.85	0.93	<0.001
Hospital teaching status[§]				
Non-teaching	0.91	0.84	0.98	0.009
Teaching	0.87	0.82	0.91	<0.001
Admission type				
Non-elective	0.88	0.83	0.94	<0.001
Elective	0.79	0.74	0.84	<0.001
Admission day				
Weekdays	0.86	0.82	0.89	<0.001
Weekend	1.00	0.86	1.16	0.948
[§] : Variables are AHRQ co-morbidity measures. : Charlson/Deyo Co-morbidity index (CCI) was calculated as per Deyo classification.				

#: Represents a quartile classification of the estimated median household income of residents in the patients ZIP Code, derived from ZIP Code-demographic data obtained from Claritas. The quartiles are identified by values of 1 to 4, indicating the poorest to wealthiest populations. Because these estimates are updated annually, the value ranges vary by year. https://www.hcup-us.ahrq.gov/db/vars/zipinc_qrtl/nrdnote.jsp

@: Heart failure is identified by ICD 9 codes in secondary diagnosis field and it includes systolic, diastolic and combined heart failure.

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α, β, ∞, ®, Ω, μ, ©: co-morbidities were identified by appropriate ICD 9 CM diagnosis codes in secondary diagnosis field (Table S3)

Figure S1. Kaplan Meier survival curve for 30-day readmission.

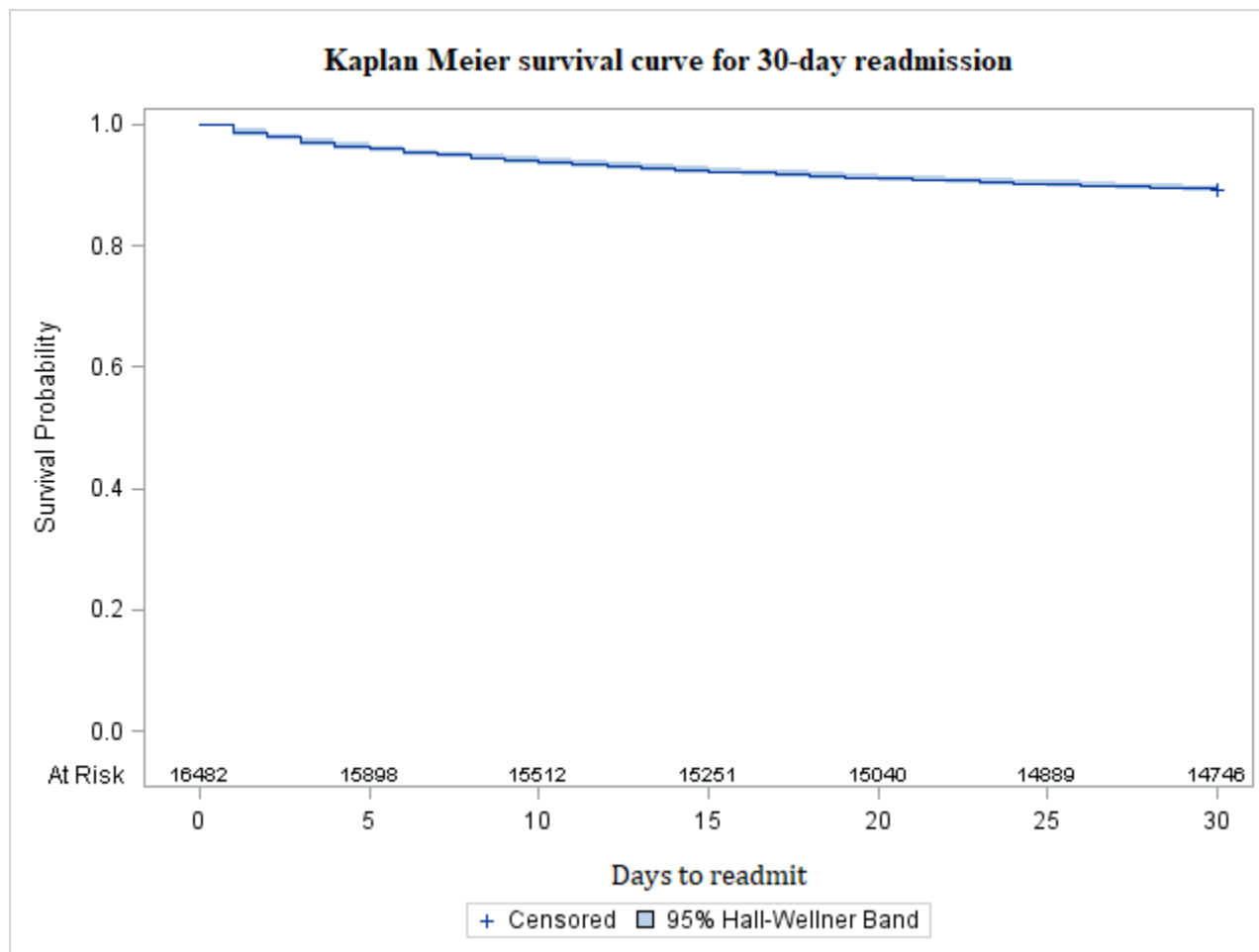


Figure S2. Kaplan Meier survival cure for 90-day readmission.

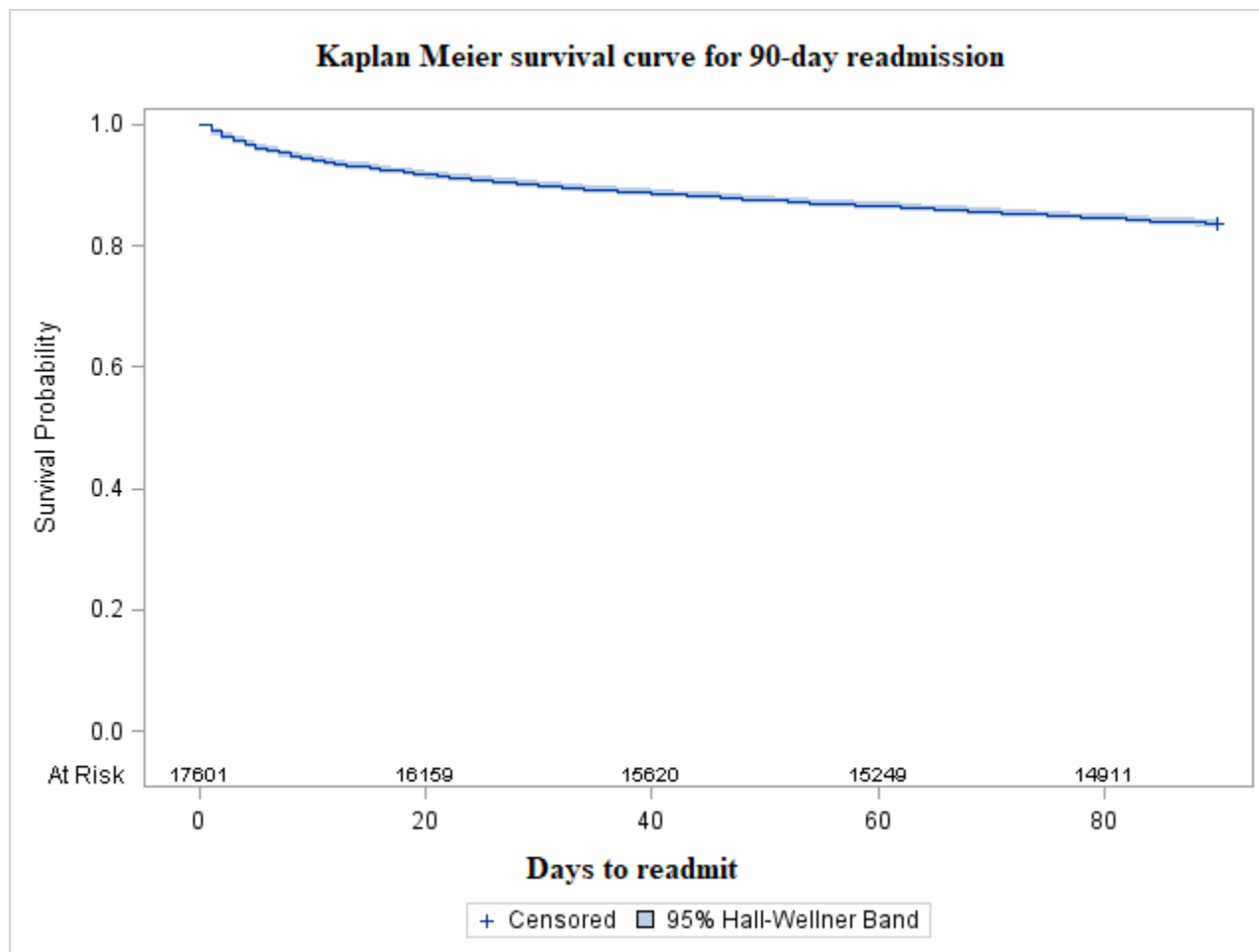


Figure S3. Kaplan Meier survival of atrial fibrillation recurrence over 90 days.

