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Appendix A. Diabetes Categories

Category	ICD-9 Codes	ICD-9 Code Definition
Uncontrolled	249.01	Secondary diabetes mellitus without mention of complication, uncontrolled
	249.11	Secondary diabetes mellitus with ketoacidosis, uncontrolled
	249.21	Secondary diabetes mellitus with hyperosmolarity, uncontrolled
	249.31	Secondary diabetes mellitus with other coma, uncontrolled
	249.41	Secondary diabetes mellitus with renal manifestations, uncontrolled
	249.51	Secondary diabetes mellitus with ophthalmic manifestations, uncontrolled
	249.61	Secondary diabetes mellitus with neurological manifestations, uncontrolled
	249.71	Secondary diabetes mellitus with peripheral circulatory disorders, uncontrolled
	249.81	Secondary diabetes mellitus with other specified manifestations, uncontrolled
	249.91	Secondary diabetes mellitus with unspecified complication, uncontrolled
	250.02	Diabetes mellitus without mention of complication, type II or unspecified type, uncontrolled
	250.03	Diabetes mellitus without mention of complication, type I [juvenile type], uncontrolled
	250.12	Uncontrolled type II diabetes mellitus with short term complications of ketoacidosis
	250.13	Uncontrolled type II diabetes mellitus with short term complications of ketoacidosis
	250.22	Diabetes with hyperosmolarity, type II or unspecified type, uncontrolled
	250.23	Diabetes with hyperosmolarity, type I [juvenile type], uncontrolled
	250.32	Diabetes with other coma, type II or unspecified type, uncontrolled
	250.33	Diabetes with other coma, type I [juvenile type], uncontrolled
	250.42	Type II diabetes mellitus with long term complications, renal manifestations
	250.43	Diabetes with renal manifestations, type I [juvenile type], uncontrolled
250.52	Diabetes with ophthalmic manifestations, type II or unspecified type, uncontrolled	
250.53	Diabetes with ophthalmic manifestations, type I or unspecified type, uncontrolled	
250.62	Diabetes with neurological manifestations, type II or unspecified type, uncontrolled	
250.63	Diabetes with neurological manifestations, type I [juvenile type], uncontrolled	

	250.72	Diabetes with peripheral circulatory disorders, type II or unspecified type, uncontrolled
	250.73	Diabetes with peripheral circulatory disorders, type I [juvenile type], uncontrolled
	250.82	Diabetes with other specified manifestations, type II or unspecified type, uncontrolled
	250.83	Diabetes with other specified manifestations, type I [juvenile type], uncontrolled
	250.92	Diabetes with unspecified complication, type II or unspecified type, uncontrolled
	250.93	Diabetes with unspecified complication, type I [juvenile type], uncontrolled
Complications	249.4X	Secondary diabetes mellitus with renal manifestations, not stated as uncontrolled, or unspecified
	249.5X	Secondary diabetes mellitus with ophthalmic manifestations, not stated as uncontrolled, or unspecified
	249.6X	Secondary diabetes mellitus with neurological manifestations, not stated as uncontrolled, or unspecified
	249.7X	Secondary diabetes mellitus with peripheral circulatory disorders, not stated as uncontrolled, or unspecified
	249.8X	Secondary diabetes mellitus with other specified manifestations, not stated as uncontrolled, or unspecified
	249.9X	Secondary diabetes mellitus with unspecified complication, not stated as uncontrolled, or unspecified
	250.5X	Diabetes with ophthalmic manifestations
	250.6X	Diabetes with neurological manifestations
	250.7X	Diabetes with peripheral circulatory disorders
	260.8X	Diabetes with other specified manifestations
	250.9X	Diabetes with unspecified complication
	357.2X	Polyneuropathy in diabetes
	362.01 - 362.06	Diabetic Retinopathy
Other Diabetes Codes	250.X	Diabetes mellitus
	250.00	Diabetes mellitus without mention of complication, type II or unspecified type, not stated as uncontrolled
	250.01	Diabetes mellitus without mention of complication, type I [juvenile type], not stated as uncontrolled
	250.1X	Diabetes with ketoacidosis
	250.2X	Diabetes with hyperosmolarity
	250.3X	Diabetes with other coma
	250.4X	Diabetes with renal manifestations
	250.5X	Diabetes with ophthalmic manifestations
	250.6X	Diabetes with neurological manifestations
	250.7X	Diabetes with peripheral circulatory disorders
250.8X	Diabetes with other specified manifestations	

250.9X

Diabetes with unspecified complication

Categorization Step	Result
1. Any Uncontrolled Code	Uncontrolled
2. Any Complication Code, without an uncontrolled code	Controlled - Complicated
3. Other Diabetes Codes, without code for Uncontrolled or Complication	Controlled - Uncomplicated
4. No Diabetes Code	No Diabetes

Appendix B. Elixhauser Comorbidity by arthroplasty type for Complications Cohort

Comorbidity	Knee Arthroplasty		Hip Arthroplasty	
	N (%)	Complications (95% CI)	N (%)	Complications (95% CI)
AIDS/HIV	30 (0.0%)	3.3% (0.0, 9.8)	32 (0.0%)	6.3% (0.0, 14.6)
Alcohol Abuse	262 (0.1%)	4.2% (1.8, 6.6)	175 (0.1%)	2.3% (0.1, 4.5)
Blood Loss Anemia	4,250 (1.2%)	3.1% (2.6, 3.7)	2,243 (1.4%)	3.9% (3.1, 4.7)
Cardiac Arrhythmia	56,873 (16.0%)	3.7% (3.5, 3.8)	27,586 (16.6%)	4.5% (4.2, 4.7)
Coagulopathy	9,161 (2.6%)	3.9% (3.5, 4.3)	4,431 (2.7%)	5.3% (4.7, 6.0)
Congestive Heart Failure	14,386 (4.1%)	6.0% (5.6, 6.4)	7,233 (4.4%)	7.2% (6.6, 7.8)
COPD	55,401 (15.6%)	3.5% (3.3, 3.6)	26,041 (15.7%)	4.5% (4.3, 4.8)
Deficiency Anemia	5,260 (1.5%)	3.8% (3.2, 4.3)	2,513 (1.5%)	4.5% (3.7, 5.3)
Depression	45,758 (12.9%)	2.7% (2.6, 2.9)	19,450 (11.7%)	4.4% (4.1, 4.7)
Drug Abuse	50 (0.0%)	2.0% (0.0, 5.9)	35 (0.0%)	2.9% (0.0, 8.4)
Fluid and Electrolyte Disorders	37,904 (10.7%)	4.4% (4.2, 4.6)	18,845 (11.3%)	5.6% (5.3, 6.0)
Hypothyroidism	70,816 (19.9%)	2.3% (2.2, 2.4)	31,225 (18.8%)	3.4% (3.2, 3.6)
Liver Disease	3,228 (0.9%)	4.0% (3.3, 4.7)	1,396 (0.8%)	4.8% (3.7, 5.9)
Lymphoma	1,176 (0.3%)	2.1% (1.3, 3.0)	745 (0.4%)	2.7% (1.5, 3.8)
Metastatic Cancer	297 (0.1%)	4.0% (1.8, 6.3)	293 (0.2%)	4.1% (1.8, 6.4)
Obesity	69,698 (19.6%)	2.7% (2.6, 2.9)	24,623 (14.8%)	4.0% (3.7, 4.2)
Other Neurological Diseases	8,343 (2.3%)	5.1% (4.6, 5.6)	3,564 (2.1%)	6.8% (6.0, 7.6)
Paralysis	417 (0.1%)	6.5% (4.1, 8.8)	242 (0.1%)	6.6% (3.5, 9.7)
Peptic Ulcer Disease, excluding bleeding	2,200 (0.6%)	2.7% (2.0, 3.4)	993 (0.6%)	4.9% (3.6, 6.3)
Peripheral Vascular Disease	10,417 (2.9%)	3.5% (3.2, 3.9)	5,916 (3.6%)	4.4% (3.9, 5.0)
Psychoses	2,321 (0.7%)	5.3% (4.3, 6.2)	957 (0.6%)	5.5% (4.1, 7.0)
Pulmonary Circulation Disorders	5,102 (1.4%)	28.5% (27.2, 29.7)	2,256 (1.4%)	14.4% (13.0, 15.9)
Renal Failure	26,261 (7.4%)	3.8% (3.5, 4.0)	12,024 (7.2%)	4.8% (4.4, 5.2)
Rheumatoid Arthritis/Collagen	16,317 (4.6%)	2.5% (2.3, 2.8)	7,580 (4.6%)	4.2% (3.7, 4.6)

Solid tumor without Metastasis	2,420 (0.7%)	2.2% (1.6, 2.8)	1,515 (0.9%)	3.9% (2.9, 4.9)
Valvular Disease	18,151 (5.1%)	3.5% (3.2, 3.7)	9,520 (5.7%)	4.3% (3.9, 4.7)
Weight loss	1,418 (0.4%)	9.4% (7.9, 10.9)	1,125 (0.7%)	9.0% (7.3, 10.6)

AIDS = Acquired Immunodeficiency Syndrome; HIV = Human Immunodeficiency Virus; COPD = Chronic Obstructive Pulmonary Disease

Comorbidity list excludes diabetes and, therefore, includes 30 of 31 Elixhauser's comorbidities.

Appendix C. Elixhauser Comorbidity by arthroplasty type for Readmission Cohort

Comorbidity	Knee Arthroplasty		Hip Arthroplasty	
	N (%)	Readmissions (95% CI)	N (%)	Readmissions (95% CI)
AIDS/HIV	30 (0.0%)	16.7% (3.3, 30.0)	31 (0.0%)	12.9% (1.1, 24.7)
Alcohol Abuse	259 (0.1%)	9.3% (5.7, 12.8)	174 (0.1%)	16.1% (10.6, 21.6)
Blood Loss Anemia	4,214 (1.2%)	8.8% (7.9, 9.7)	2,229 (1.4%)	7.7% (6.6, 8.8)
Cardiac Arrhythmia	55,979 (15.9%)	9.7% (9.5, 9.9)	27,203 (16.5%)	10.8% (10.5, 11.2)
Coagulopathy	9,017 (2.6%)	9.7% (9.1, 10.3)	4,369 (2.7%)	10.4% (9.5, 11.3)
Congestive Heart Failure	14,145 (4.0%)	14.9% (14.3, 15.5)	7,105 (4.3%)	16.0% (15.1, 16.8)
COPD	54,632 (15.6%)	9.2% (9.0, 9.4)	25,736 (15.6%)	10.6% (10.2, 11.0)
Deficiency Anemia	5,202 (1.5%)	10.3% (9.5, 11.2)	2,489 (1.5%)	11.8% (10.5, 13.0)
Depression	45,232 (12.9%)	7.8% (7.6, 8.1)	19,247 (11.7%)	9.6% (9.2, 10.0)
Drug Abuse	49 (0.0%)	8.2% (0.5, 15.8)	34 (0.0%)	8.8% (0.0, 18.4)
Fluid and Electrolyte Disorders	37,273 (10.6%)	9.5% (9.2, 9.8)	18,581 (11.3%)	10.7% (10.3, 11.2)
Hypothyroidism	69,991 (19.9%)	7.0% (6.8, 7.2)	30,926 (18.8%)	8.0% (7.7, 8.3)
Liver Disease	3,181 (0.9%)	9.1% (8.1, 10.1)	1,383 (0.8%)	9.8% (8.2, 11.3)
Lymphoma	1,164 (0.3%)	9.6% (7.9, 11.3)	737 (0.4%)	10.7% (8.5, 13.0)
Metastatic Cancer	292 (0.1%)	10.3% (6.8, 13.8)	288 (0.2%)	14.9% (10.8, 19.0)
Obesity	68,756 (19.6%)	7.1% (6.9, 7.3)	24,348 (14.8%)	9.0% (8.6, 9.4)
Other Neurological Diseases	8,235 (2.3%)	11.4% (10.8, 12.1)	3,510 (2.1%)	12.9% (11.8, 14.0)
Paralysis	404 (0.1%)	13.6% (10.3, 17.0)	233 (0.1%)	12.4% (8.2, 16.7)
Peptic Ulcer Disease, excluding bleeding	2,180 (0.6%)	8.6% (7.4, 9.8)	983 (0.6%)	10.9% (8.9, 12.8)
Peripheral Vascular Disease	10,248 (2.9%)	11.0% (10.4, 11.6)	5,841 (3.6%)	11.8% (11.0, 12.6)
Psychoses	2,286 (0.7%)	13.3% (11.9, 14.7)	943 (0.6%)	14.3% (12.1, 16.6)
Pulmonary Circulation Disorders	4,975 (1.4%)	13.5% (12.6, 14.5)	2,214 (1.3%)	16.6% (15.1, 18.2)

Renal Failure	25,876 (7.4%)	11.9% (11.5, 12.3)	11,874 (7.2%)	12.6% (12.1, 13.2)
Rheumatoid Arthritis/Collagen	16,119 (4.6%)	8.1% (7.6, 8.5)	7,485 (4.5%)	10.6% (9.9, 11.3)
Solid tumor without Metastasis	2,395 (0.7%)	8.4% (7.3, 9.5)	1,503 (0.9%)	8.8% (7.4, 10.3)
Valvular Disease	17,820 (5.1%)	9.4% (9.0, 9.8)	9,375 (5.7%)	10.6% (10.0, 11.2)
Weight loss	1,398 (0.4%)	13.4% (11.6, 15.2)	1,106 (0.7%)	15.6% (13.4, 17.7)

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Comorbidity list excludes diabetes and, therefore, includes 30 of 31 Elixhauser's comorbidities.