

Supplemental Online Content

Schwartz AL, Brennan TA, Verbrugge DJ, Newhouse JP. Measuring the scope of prior authorization policies: applying private insurer rules to Medicare Part B. *JAMA Health Forum*. 2021;2(5):e10859. doi:10.1001/jamahealthforum.2021.0859

eAppendix. Methods

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This supplemental material has been provided by the authors to give readers additional information about their work.

eAppendix. Methods

Service-Specific Exclusion Criteria

The list of services requiring prior authorization during the study period was nearly identical between Medicare Advantage and non-Medicare (commercial) plans. Whether a service required prior authorization generally depended only on the HCPCS code defining a service. However, for some services, the prior authorization requirement depended on additional criteria. During the study period, several categories of services did not require prior authorization if they were performed in an inpatient hospital setting, during a hospital observation stay, or during an emergency department visit. This place of service restriction applied to radiology services, radiation oncology services, cardiac catheterization, echocardiography, and polysomnography.

For these categories of prior authorization services, we operationalized the place of service restrictions as follows. We excluded prior authorization services that occurred on dates during an inpatient hospital admission as detected in the Medicare Provider Analysis and Review (MEDPAR) file, including the dates of admission and discharge. We excluded prior authorization services that occurred on the same day as emergency department services, defined by the presence of HCPCS codes 99281, 99282, 99283, 99284, or 99285 in the Medicare Carrier or Outpatient files, or the presence of revenue center codes 0450, 0451, 0452, 0456, 0459, or 0981 in the Outpatient file. We excluded prior authorization services that occurred on the same day as a hospital observation stay, defined by the presence of HCPCS codes G0378 and G0379 or revenue center codes 0760, 0761, 0762, or 0769 in the Outpatient file.¹ We did not employ these place of service restrictions for polysomnography out of concern that this restriction might lead to inappropriate classification of outpatient polysomnography services as occurring during

hospital observation stays. Unlike the other prior authorization services subject to place of service rules, polysomnography is rarely performed in emergency or inpatient settings, and some of the revenue center codes used to define hospital observation stays (i.e. 0760, “treatment or observation room-general classification”) may be applied to polysomnography performed in a hospital outpatient setting.

Prior authorization for one service category, breast reconstruction or reduction, was only required in the absence of a breast cancer diagnosis. We therefore excluded claims for patients with breast cancer diagnosed during or prior to 2017 per the Chronic Conditions Warehouse.² Per Aetna rules, we excluded claims for dorsal column neurostimulator hardware (HCPCS codes C1767 C1816 C1820) unless they were accompanied by procedure codes for implantation or revision (HCPCS codes 63650, 63655, 63663, 63664, 63685, 63688) within the same claim.

Place of Service Assignment

Place of service was assigned based on the value of the claim line place of service code, which is present in Carrier and DME files. We assigned claim lines to five categories based on the codes presented parenthetically: office (11), inpatient hospital (2), outpatient hospital (19, 22) or home (12), or other (all other codes). We assigned claim lines detected in the Outpatient file to the outpatient hospital category. For each service instance, we assigned the modal location for all claim lines that had the same beneficiary, HCPCS code and service date.

Spending Imputation

Spending was imputed for a prior authorization service if the service only appeared in an Outpatient file claim for which service-level spending was absent, which occurred for 21.5% of

prior authorization services. In 99.96% of such cases, we imputed spending using the mean service-level spending for the same procedure code among Outpatient claims in which service-level spending was present. For the 0.04% of service instances whose procedure codes never appeared with Outpatient service-level spending, we imputed spending with mean service-level spending in the Carrier file, or if absent, with mean spending in the narrow service category encompassing the procedure code.

Savings Analysis

The methods employed in this manuscript allow us to estimate the spending associated with prior authorization services in fee-for-service Medicare. However, these spending estimates should not be construed as causal estimates of savings that would be achieved if fee-for-service Medicare were to adopt prior authorization in the manner that Medicare Advantage plans have. While potential savings depends on aggregate spending on prior authorization services, it is also a function of several other features of a prior authorization program. Gross savings from avoided services also depends on the program's effectiveness at deterring services without adjudicating authorization requests (i.e. a sentinel effect), its rate of rejecting authorization requests, the magnitude of spending on services that complement a prior authorization service (i.e. "cascade" services), and the magnitude of spending on substitute services that replace an avoided service. Calculating *net* insurer savings would require subtracting the costs of insurer administration of the program. If one aimed to estimate net savings at a society level rather than an insurer level, one would also have to account for monetary costs beyond the insurer such as compliance costs for providers.

Given such complexity, rather than attempt to produce a credible estimate of net prior authorization savings, we perform basic calculations to demonstrate how gross savings estimates depend heavily on program features. If one considers only gross savings derived from targeted prior authorization services (i.e. without offsets from substitute services or augmentation from cascade services), there are two sources of savings. These are services deterred by prior authorization without submission of an authorization request and services avoided because an authorization request was rejected. This amount of savings, as a proportion of overall Part B spending, can be expressed as follows:

$$s(d + (1 - d)\bar{r})$$

where s is the share of Medicare spending on prior authorization services, d is the proportion of spending on prior authorization services that is deterred by the program without rejection of an application request, and \bar{r} is the average rate at which prior authorization requests are rejected, weighted by the baseline spending on each service.

In this simplified framework, coarse savings projections are possible with informed assumptions about each variable. As part of our main analysis, we calculated s as 25%. To estimate \bar{r} , we employed proprietary data from Aetna on service-level prior authorization rates for their 2017 Medicare Advantage enrollees. We merged HCPCS-level rejection rates to the prior authorization services we detected in fee-for-service Medicare. When a rejection rate was missing (i.e. because no prior authorizations for that HCPCS were requested for Medicare Advantage enrollees that year), we imputed the rejection rate as the average rejection rate in the service categories present in Figure 2. If that average rate was missing, we used the average rate in the broader service category groups presented in Figure 1 (i.e. durable medical equipment or

ambulance, radiology, medical or surgical service, or drug/injectable). We calculated \bar{r} as the average rejection rates across every prior authorization procedure code, weighted by the fee-for-service spending associated with each code. The weighted average rejection rate was 4.2 percent. This figure differs somewhat from the unweighted average rejection rate across HCPCS codes, 9.2%, and from the average rejection rate when weighted by utilization in fee-for-service Medicare, 6.9%. Notably, the latter figure is very similar to a previously published estimate of a prior authorization service rejection rate (6%) for an anonymous private insurer.³

The deterrence rate d is not readily estimable from our data. Therefore, the Supplement (eFigure1) demonstrates how estimates of gross savings would vary with alternate levels of d . Using our empirical estimates of s and \bar{r} , gross savings projections range from 25% of Part B spending if deterrence were 100% to 1% if deterrence effects were zero. The figure also demonstrates how savings projections are sensitive to alternate estimates of \bar{r} , ranging from 0% to 25%.

We are unaware of prior studies that quantify the prior authorization deterrence effects and rejection rates for Part B type medical services. One recent study examined the effects of a prior authorization program in Texas targeting certain prescription drugs used to treat work-related disabilities.⁴ This policy reduced prescribing of these drugs by half, though the study was not able to differentiate between the relative contributions of deterrence effects and rejections. The paper also reviewed findings from several other studies on prescription drug prior authorization policies, concluding that savings estimates varied dramatically.

eReferences

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eTable 1: Service Codes, Category, Annual Spending and Annual Incidence				
HCPCS	Narrow Service Category	Broad Service Category	Annual Spending^a	Annual Count^a
0042T	CT Scans	Radiology Services	6704	29
0230T	Pain Management	Musculoskeletal Services		
0231T	Pain Management	Musculoskeletal Services		
0394T	Radiation Oncology	Radiation Oncology Services	1141815	5514
0395T	Radiation Oncology	Radiation Oncology Services		
15820	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	131267	83
15821	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	234553	94
15822	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	1353277	890
15823	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	16735127	10074
15830	Excision of excessive skin or fat	Other Services	1629530	512
15832	Excision of excessive skin or fat	Other Services	38938	22
15833	Excision of excessive skin or fat	Other Services		
15834	Excision of excessive skin or fat	Other Services		
15835	Excision of excessive skin or fat	Other Services		
15836	Excision of excessive skin or fat	Other Services	52876	33
15837	Excision of excessive skin or fat	Other Services		
15838	Excision of excessive skin or fat	Other Services		
15839	Excision of excessive skin or fat	Other Services	156536	120
15847	Excision of excessive skin or fat	Other Services	46165	113
15876	Excision of excessive skin or fat	Other Services		
15877	Excision of excessive skin or fat	Other Services	177550	72
15878	Excision of excessive skin or fat	Other Services		
15879	Excision of excessive skin or fat	Other Services		
19316	Breast Reconstruction or Reduction	Other Services	1223161	610
19318	Breast Reconstruction or Reduction	Other Services	4691550	1058
19324	Breast Reconstruction or Reduction	Other Services		
19325	Breast Reconstruction or Reduction	Other Services	366169	132
19328	Breast Reconstruction or Reduction	Other Services	708806	578
19330	Breast Reconstruction or Reduction	Other Services	172942	145
19340	Breast Reconstruction or Reduction	Other Services	436206	83
19342	Breast Reconstruction or Reduction	Other Services		
19350	Breast Reconstruction or Reduction	Other Services	44885	27
19355	Breast Reconstruction or Reduction	Other Services		
19357	Breast Reconstruction or Reduction	Other Services		
19370	Breast Reconstruction or Reduction	Other Services	33901	30
19371	Breast Reconstruction or Reduction	Other Services	620877	262
19380	Breast Reconstruction or Reduction	Other Services	178686	50
21010	Surgical Management of TMJ	Ear/Nose/Throat Services		
21050	Surgical Management of TMJ	Ear/Nose/Throat Services		
21060	Surgical Management of TMJ	Ear/Nose/Throat Services		
21070	Surgical Management of TMJ	Ear/Nose/Throat Services		

21073	Surgical Management of TMJ	Ear/Nose/Throat Services	13453	29
21122	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21125	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21127	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21141	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21142	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21143	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21145	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21146	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21147	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21150	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21154	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21193	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21195	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21196	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21198	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services	50278	42
21199	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21206	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services		
21208	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services	508097	457
21209	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services	22589	25
21210	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services	1596960	696
21215	Orthognathic surgery procedures and osteotomies	Ear/Nose/Throat Services	2757845	644
21240	Surgical Management of TMJ	Ear/Nose/Throat Services	169158	41
21242	Surgical Management of TMJ	Ear/Nose/Throat Services		
21243	Surgical Management of TMJ	Ear/Nose/Throat Services		
21244	Surgical Management of TMJ	Ear/Nose/Throat Services	108281	123
21245	Dental implants	Ear/Nose/Throat Services		
21246	Dental implants	Ear/Nose/Throat Services		
21248	Dental implants	Ear/Nose/Throat Services	151748	86
21249	Dental implants	Ear/Nose/Throat Services	60415	22
21480	Surgical Management of TMJ	Ear/Nose/Throat Services	44506	240
21485	Surgical Management of TMJ	Ear/Nose/Throat Services		
21490	Surgical Management of TMJ	Ear/Nose/Throat Services		
21497	Surgical Management of TMJ	Ear/Nose/Throat Services		
22532	Spinal Fusion	Musculoskeletal Services	71209	61
22533	Spinal Fusion	Musculoskeletal Services	324279	200
22534	Spinal Fusion	Musculoskeletal Services	56671	109
22551	Spinal Fusion	Musculoskeletal Services	35629292	7436
22552	Spinal Fusion	Musculoskeletal Services	2931257	4471
22554	Spinal Fusion	Musculoskeletal Services	2150054	1097
22556	Spinal Fusion	Musculoskeletal Services	137561	106
22558	Spinal Fusion	Musculoskeletal Services	4816008	3459
22585	Spinal Fusion	Musculoskeletal Services	1174459	2258
22610	Spinal Fusion	Musculoskeletal Services	1290611	1386
22612	Spinal Fusion	Musculoskeletal Services	19219603	8716
22614	Spinal Fusion	Musculoskeletal Services	11225086	9725
22630	Spinal Fusion	Musculoskeletal Services	2000934	1224
22632	Spinal Fusion	Musculoskeletal Services	160911	357

22633	Spinal Fusion	Musculoskeletal Services	14121631	7038
22634	Spinal Fusion	Musculoskeletal Services	1499772	2139
22840	Spinal Fusion	Musculoskeletal Services	6528610	7780
22842	Spinal Fusion	Musculoskeletal Services	8703644	9992
22843	Spinal Fusion	Musculoskeletal Services	1380280	1530
22844	Spinal Fusion	Musculoskeletal Services	202263	181
22845	Spinal Fusion	Musculoskeletal Services	5263695	6551
22846	Spinal Fusion	Musculoskeletal Services	1465267	1751
22847	Spinal Fusion	Musculoskeletal Services		
22848	Spinal Fusion	Musculoskeletal Services	386086	953
22853	Spinal Fusion	Musculoskeletal Services	6993738	15582
22854	Spinal Fusion	Musculoskeletal Services	546399	1021
22856	Artificial Disc Surgery: Cervical	Musculoskeletal Services	2111797	212
22858	Artificial Disc Surgery: Cervical	Musculoskeletal Services	45412	81
22859	Spinal Fusion	Musculoskeletal Services	219205	416
22861	Artificial Disc Surgery: Cervical	Musculoskeletal Services		
27090	Hip Arthroplasty	Musculoskeletal Services	46939	78
27091	Hip Arthroplasty	Musculoskeletal Services	672117	420
27096	Pain Management	Musculoskeletal Services	9125219	62207
27125	Hip Arthroplasty	Musculoskeletal Services	2126874	1880
27130	Hip Arthroplasty	Musculoskeletal Services	44939304	29856
27132	Hip Arthroplasty	Musculoskeletal Services	2147627	1214
27134	Hip Arthroplasty	Musculoskeletal Services	4236705	2190
27137	Hip Arthroplasty	Musculoskeletal Services	1173343	796
27138	Hip Arthroplasty	Musculoskeletal Services	1252724	842
27412	Autologous Chondrocyte Implantation (Carticel)	Musculoskeletal Services		
27415	Osteochondral Allograft/Knee	Musculoskeletal Services		
27437	Knee Arthrotomy	Musculoskeletal Services	115104	177
27438	Knee Arthrotomy	Musculoskeletal Services	681844	227
27440	Knee Arthrotomy	Musculoskeletal Services		
27441	Knee Arthrotomy	Musculoskeletal Services		
27442	Knee Arthrotomy	Musculoskeletal Services	840939	114
27443	Knee Arthrotomy	Musculoskeletal Services	49195	22
27445	Knee Arthroplasty	Musculoskeletal Services	59395	51
27446	Knee Arthroplasty	Musculoskeletal Services	22565220	3125
27447	Knee Arthroplasty	Musculoskeletal Services	86523184	57352
27486	Knee Arthroplasty	Musculoskeletal Services	2950935	2103
27487	Knee Arthroplasty	Musculoskeletal Services	5785259	3103
27488	Knee Arthrotomy	Musculoskeletal Services	1126299	930
29800	Surgical Management of TMJ	Ear/Nose/Throat Services		
29804	Surgical Management of TMJ	Ear/Nose/Throat Services	79735	32
29914	Hip surgery to repair impingement syndrome	Musculoskeletal Services	230156	167
29915	Hip surgery to repair impingement syndrome	Musculoskeletal Services	466853	107
32851	Lung Transplant	Other Services	178542	48
32852	Lung Transplant	Other Services		
32853	Lung Transplant	Other Services	192819	39
32854	Lung Transplant	Other Services	269575	48
32855	Lung Transplant	Other Services	9468	54

32856	Lung Transplant	Other Services	16049	76
33206	Pacemaker/Defibrillator	Cardiac Services	1415330	247
33207	Pacemaker/Defibrillator	Cardiac Services	15805507	3360
33208	Pacemaker/Defibrillator	Cardiac Services	92535338	20635
33212	Pacemaker/Defibrillator	Cardiac Services	161824	113
33213	Pacemaker/Defibrillator	Cardiac Services	1066221	399
33214	Pacemaker/Defibrillator	Cardiac Services	453886	104
33221	Pacemaker/Defibrillator	Cardiac Services	993894	90
33224	Pacemaker/Defibrillator	Cardiac Services	1428688	339
33225	Pacemaker/Defibrillator	Cardiac Services	4653128	6929
33227	Pacemaker/Defibrillator	Cardiac Services	7299401	1208
33228	Pacemaker/Defibrillator	Cardiac Services	59641063	7168
33229	Pacemaker/Defibrillator	Cardiac Services	14662821	1200
33230	Pacemaker/Defibrillator	Cardiac Services	526969	55
33231	Pacemaker/Defibrillator	Cardiac Services	680571	59
33240	Pacemaker/Defibrillator	Cardiac Services	434318	115
33249	Pacemaker/Defibrillator	Cardiac Services	176404351	9304
33262	Pacemaker/Defibrillator	Cardiac Services	14483264	817
33263	Pacemaker/Defibrillator	Cardiac Services	47449564	2710
33264	Pacemaker/Defibrillator	Cardiac Services	85315262	3571
33270	Pacemaker/Defibrillator	Cardiac Services	5579809	281
33271	Pacemaker/Defibrillator	Cardiac Services		
33272	Pacemaker/Defibrillator	Cardiac Services	26556	35
33273	Pacemaker/Defibrillator	Cardiac Services		
33933	Heart/lung transplant	Cardiac Services		
33935	Heart/lung transplant	Cardiac Services		
33944	Heart Transplant	Cardiac Services	19763	97
33945	Heart Transplant	Cardiac Services	785936	145
33975	Left Ventricular Assist Devices	Cardiac Services	51985	45
33976	Left Ventricular Assist Devices	Cardiac Services		
33977	Left Ventricular Assist Devices	Cardiac Services		
33978	Left Ventricular Assist Devices	Cardiac Services		
33979	Left Ventricular Assist Devices	Cardiac Services	432313	222
33980	Left Ventricular Assist Devices	Cardiac Services	81792	68
33982	Left Ventricular Assist Devices	Cardiac Services		
33983	Left Ventricular Assist Devices	Cardiac Services	98010	39
33990	Left Ventricular Assist Devices	Cardiac Services	355050	1116
33991	Left Ventricular Assist Devices	Cardiac Services		
33992	Left Ventricular Assist Devices	Cardiac Services	43354	251
33993	Left Ventricular Assist Devices	Cardiac Services	14932	93
36475	Venous ligation	Vascular Services	38115020	23010
36476	Venous ligation	Vascular Services	548230	1896
36478	Venous ligation	Vascular Services	19465263	15040
36479	Venous ligation	Vascular Services	465980	1444
37500	Venous ligation	Vascular Services		
37700	Venous ligation	Vascular Services	201840	159
37718	Venous ligation	Vascular Services	81254	46
37722	Venous ligation	Vascular Services	297785	142

37735	Venous ligation	Vascular Services		
37760	Venous ligation	Vascular Services		
37761	Venous ligation	Vascular Services	49827	88
37780	Venous ligation	Vascular Services		
37785	Venous ligation	Vascular Services	160341	259
38204	Bone Marrow Transplant	Other Services	34747	56
38205	Bone Marrow Transplant	Other Services	4076	48
38206	Bone Marrow Transplant	Other Services	1021545	988
38207	Bone Marrow Transplant	Other Services	289553	786
38208	Bone Marrow Transplant	Other Services	25240	73
38209	Bone Marrow Transplant	Other Services		
38210	Bone Marrow Transplant	Other Services		
38211	Bone Marrow Transplant	Other Services		
38212	Bone Marrow Transplant	Other Services		
38213	Bone Marrow Transplant	Other Services		
38214	Bone Marrow Transplant	Other Services	112720	324
38215	Bone Marrow Transplant	Other Services	32183	83
38230	Bone Marrow Transplant	Other Services		
38232	Bone Marrow Transplant	Other Services	41444	42
38240	Bone Marrow Transplant	Other Services	129439	113
38241	Bone Marrow Transplant	Other Services	117136	369
38242	Bone Marrow Transplant	Other Services	32883	41
42140	Uvulopalatopharyngoplasty	Ear/Nose/Throat Services	74824	73
42145	Uvulopalatopharyngoplasty	Ear/Nose/Throat Services	490096	164
42299	Uvulopalatopharyngoplasty	Ear/Nose/Throat Services		
43631	Gastroplasty, Gastric Bypass	Other Services	151918	114
43632	Gastroplasty, Gastric Bypass	Other Services	514073	244
43633	Gastroplasty, Gastric Bypass	Other Services	392268	196
43634	Gastroplasty, Gastric Bypass	Other Services		
43644	Gastroplasty, Gastric Bypass	Other Services	1455153	786
43645	Gastroplasty, Gastric Bypass	Other Services	73581	36
43659	Gastroplasty, Gastric Bypass	Other Services	1046195	606
43770	Gastroplasty, Gastric Bypass	Other Services	258545	41
43771	Gastroplasty, Gastric Bypass	Other Services		
43772	Gastroplasty, Gastric Bypass	Other Services	19611	24
43773	Gastroplasty, Gastric Bypass	Other Services		
43774	Gastroplasty, Gastric Bypass	Other Services	404859	421
43775	Gastroplasty, Gastric Bypass	Other Services	2338625	2146
43845	Gastroplasty, Gastric Bypass	Other Services	87373	42
43846	Gastroplasty, Gastric Bypass	Other Services		
43847	Gastroplasty, Gastric Bypass	Other Services		
43848	Gastroplasty, Gastric Bypass	Other Services	53071	28
43886	Gastroplasty, Gastric Bypass	Other Services		
43887	Gastroplasty, Gastric Bypass	Other Services		
43888	Gastroplasty, Gastric Bypass	Other Services		
43999	Gastroplasty, Gastric Bypass	Other Services	550249	2184
44135	Intestinal transplant	Other Services		
44137	Intestinal transplant	Other Services		

44715	Intestinal transplant	Other Services		
47135	Liver Transplant	Other Services	1877136	299
47142	Liver Transplant	Other Services		
47143	Liver Transplant	Other Services	64092	263
47145	Liver Transplant	Other Services		
47146	Liver Transplant	Other Services		
47147	Liver Transplant	Other Services	8427	35
48551	Pancreas transplant	Other Services	11103	75
48552	Pancreas transplant	Other Services		
48554	Pancreas transplant	Other Services	206131	74
48556	Pancreas transplant	Other Services		
49999	Gastroplasty, Gastric Bypass	Other Services	321989	507
50320	Renal transplant	Other Services		
50323	Renal transplant	Other Services	195656	1594
50325	Renal transplant	Other Services	31619	307
50327	Renal transplant	Other Services	58501	487
50328	Renal transplant	Other Services	20706	190
50329	Renal transplant	Other Services	5617	55
50340	Renal transplant	Other Services		
50360	Renal transplant	Other Services	5168095	2025
50365	Renal transplant	Other Services	74381	24
50380	Renal transplant	Other Services		
55970	Intersex Surgery	Other Services		
56805	Intersex Surgery	Other Services		
57335	Intersex Surgery	Other Services		
58321	Infertility Services	Other Services		
58322	Infertility Services	Other Services		
58323	Infertility Services	Other Services		
58970	Infertility Services	Other Services		
58974	Infertility Services	Other Services		
62320	Pain Management	Musculoskeletal Services	744291	2681
62321	Pain Management	Musculoskeletal Services	16202399	42695
62322	Pain Management	Musculoskeletal Services	3661933	14680
62323	Pain Management	Musculoskeletal Services	57467216	147334
62324	Pain Management	Musculoskeletal Services	489451	5000
62325	Pain Management	Musculoskeletal Services	83996	378
62326	Pain Management	Musculoskeletal Services	167458	1489
62327	Pain Management	Musculoskeletal Services	201121	557
63001	Laminectomy and Laminotomy	Musculoskeletal Services	290743	261
63003	Laminectomy and Laminotomy	Musculoskeletal Services	190816	144
63005	Laminectomy and Laminotomy	Musculoskeletal Services	1141681	476
63011	Laminectomy and Laminotomy	Musculoskeletal Services	55016	63
63012	Laminectomy and Laminotomy	Musculoskeletal Services	376753	434
63015	Laminectomy and Laminotomy	Musculoskeletal Services	1131058	677
63016	Laminectomy and Laminotomy	Musculoskeletal Services	107024	69
63017	Laminectomy and Laminotomy	Musculoskeletal Services	448346	221
63020	Laminectomy and Laminotomy	Musculoskeletal Services	1004462	340
63030	Laminectomy and Laminotomy	Musculoskeletal Services	27277234	7105

63035	Laminectomy and Laminotomy	Musculoskeletal Services	1927345	1586
63040	Laminectomy and Laminotomy	Musculoskeletal Services	137955	61
63042	Laminectomy and Laminotomy	Musculoskeletal Services	4881237	2188
63043	Laminectomy and Laminotomy	Musculoskeletal Services	18009	23
63044	Laminectomy and Laminotomy	Musculoskeletal Services	446292	695
63045	Laminectomy and Laminotomy	Musculoskeletal Services	3688418	2087
63046	Laminectomy and Laminotomy	Musculoskeletal Services	1114241	738
63047	Laminectomy and Laminotomy	Musculoskeletal Services	51065495	20935
63048	Laminectomy and Laminotomy	Musculoskeletal Services	6351467	15594
63055	Laminectomy and Laminotomy	Musculoskeletal Services	265826	142
63056	Laminectomy and Laminotomy	Musculoskeletal Services	2750378	1308
63057	Laminectomy and Laminotomy	Musculoskeletal Services	208811	396
63064	Laminectomy and Laminotomy	Musculoskeletal Services	69265	39
63066	Laminectomy and Laminotomy	Musculoskeletal Services		
63075	Laminectomy and Laminotomy	Musculoskeletal Services	420232	181
63076	Laminectomy and Laminotomy	Musculoskeletal Services	40207	73
63077	Laminectomy and Laminotomy	Musculoskeletal Services	24864	25
63078	Laminectomy and Laminotomy	Musculoskeletal Services		
63650	Dorsal Column Neurostimulators	Musculoskeletal Services	48515218	9167
63655	Dorsal Column Neurostimulators	Musculoskeletal Services	8579106	1733
63663	Dorsal Column Neurostimulators	Musculoskeletal Services	1193490	393
63664	Dorsal Column Neurostimulators	Musculoskeletal Services	1375769	193
63685	Dorsal Column Neurostimulators	Musculoskeletal Services	121288595	5693
63688	Dorsal Column Neurostimulators	Musculoskeletal Services	2444192	1627
64479	Pain Management	Musculoskeletal Services	3562722	7734
64480	Pain Management	Musculoskeletal Services	379291	3228
64483	Pain Management	Musculoskeletal Services	73533939	155443
64484	Pain Management	Musculoskeletal Services	5930279	71652
64490	Pain Management	Musculoskeletal Services	15452274	33225
64491	Pain Management	Musculoskeletal Services	3000072	29515
64492	Pain Management	Musculoskeletal Services	2069511	20294
64493	Pain Management	Musculoskeletal Services	51051176	104012
64494	Pain Management	Musculoskeletal Services	8977915	91952
64495	Pain Management	Musculoskeletal Services	5699776	56222
64510	Pain Management	Musculoskeletal Services	500207	1402
64520	Pain Management	Musculoskeletal Services	1520669	3955
64633	Pain Management	Musculoskeletal Services	11904999	12879
64634	Pain Management	Musculoskeletal Services	2776072	11732
64635	Pain Management	Musculoskeletal Services	51255236	51954
64636	Pain Management	Musculoskeletal Services	10265746	47265
67900	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	3109995	2146
67901	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	150305	102
67902	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	56921	23
67903	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	910586	682
67904	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	11268593	6411
67906	Blepharoplasty, Canthopexy, Canthoplasty	Other Services		
67908	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	1148562	844
67950	Blepharoplasty, Canthopexy, Canthoplasty	Other Services	1397065	1398

69714	Osseointegrated Implant	Ear/Nose/Throat Services	1923749	248
69930	Cochlear Device and/or Implantation	Ear/Nose/Throat Services	23254651	779
70336	MRI	Radiology Services	189534	558
70450	CT Scans	Radiology Services	22139005	147354
70460	CT Scans	Radiology Services	916359	3614
70470	CT Scans	Radiology Services	4819603	15550
70480	CT Scans	Radiology Services	1414736	7506
70481	CT Scans	Radiology Services	351128	1160
70482	CT Scans	Radiology Services	327108	1009
70486	CT Scans	Radiology Services	8198115	51189
70487	CT Scans	Radiology Services	579127	2062
70488	CT Scans	Radiology Services	176028	608
70490	CT Scans	Radiology Services	1660848	8243
70491	CT Scans	Radiology Services	12639151	36929
70492	CT Scans	Radiology Services	1288120	4106
70496	CT Scans	Radiology Services	5996163	16717
70498	CT Scans	Radiology Services	5539681	22274
70540	MRI	Radiology Services	624518	1893
70542	MRI	Radiology Services	71737	242
70543	MRI	Radiology Services	5749698	10544
70544	MRI	Radiology Services	7774623	25015
70545	MRI	Radiology Services	167410	471
70546	MRI	Radiology Services	1137797	2334
70547	MRI	Radiology Services	1501737	6658
70548	MRI	Radiology Services	489896	1808
70549	MRI	Radiology Services	2747635	6774
70551	MRI	Radiology Services	31359261	109966
70552	MRI	Radiology Services	1227941	3344
70553	MRI	Radiology Services	73390903	143451
70554	MRI	Radiology Services	29153	105
70555	MRI	Radiology Services	22134	60
71250	CT Scans	Radiology Services	50255482	272118
71260	CT Scans	Radiology Services	79654664	236286
71270	CT Scans	Radiology Services	3527441	11571
71275	CT Scans	Radiology Services	16977605	54131
71550	MRI	Radiology Services	274468	902
71551	MRI	Radiology Services	24234	56
71552	MRI	Radiology Services	680402	1179
71555	MRI	Radiology Services	303609	1577
72125	CT Scans	Radiology Services	4793376	29742
72126	CT Scans	Radiology Services	1131322	2952
72127	CT Scans	Radiology Services	85939	310
72128	CT Scans	Radiology Services	1712925	9037
72129	CT Scans	Radiology Services	457658	1790
72130	CT Scans	Radiology Services	50147	186
72131	CT Scans	Radiology Services	7084828	40574
72132	CT Scans	Radiology Services	2509591	7898
72133	CT Scans	Radiology Services	191625	718

72141	MRI	Radiology Services	29974782	100999
72142	MRI	Radiology Services	177717	620
72146	MRI	Radiology Services	9921518	33136
72147	MRI	Radiology Services	127848	480
72148	MRI	Radiology Services	64829382	238138
72149	MRI	Radiology Services	356451	1083
72156	MRI	Radiology Services	8249967	18006
72157	MRI	Radiology Services	5743911	12615
72158	MRI	Radiology Services	17909845	40553
72159	MRI	Radiology Services		
72191	CT Scans	Radiology Services	157148	449
72192	CT Scans	Radiology Services	1624530	9609
72193	CT Scans	Radiology Services	1095125	3794
72194	CT Scans	Radiology Services	264800	939
72195	MRI	Radiology Services	4347595	13574
72196	MRI	Radiology Services	222841	614
72197	MRI	Radiology Services	16684749	29724
72198	MRI	Radiology Services	127764	579
73200	CT Scans	Radiology Services	2379979	13249
73201	CT Scans	Radiology Services	663758	2431
73202	CT Scans	Radiology Services	71037	275
73206	CT Scans	Radiology Services	124955	380
73218	MRI	Radiology Services	1826750	5630
73219	MRI	Radiology Services	29499	83
73220	MRI	Radiology Services	1390648	2626
73221	MRI	Radiology Services	25086597	84580
73222	MRI	Radiology Services	2230745	4048
73223	MRI	Radiology Services	1418810	2864
73225	MRI	Radiology Services		
73700	CT Scans	Radiology Services	4639243	25565
73701	CT Scans	Radiology Services	609084	2351
73702	CT Scans	Radiology Services	161232	566
73706	CT Scans	Radiology Services	457921	1106
73718	MRI	Radiology Services	6607311	20147
73719	MRI	Radiology Services	64193	219
73720	MRI	Radiology Services	3915863	7351
73721	MRI	Radiology Services	35075599	118300
73722	MRI	Radiology Services	771596	1463
73723	MRI	Radiology Services	2129181	4261
73725	MRI	Radiology Services	377592	902
74150	CT Scans	Radiology Services	2064953	13135
74160	CT Scans	Radiology Services	5285287	20814
74170	CT Scans	Radiology Services	6069350	20140
74174	CT Scans	Radiology Services	10204988	28332
74175	CT Scans	Radiology Services	1583260	5462
74176	CT Scans	Radiology Services	37664616	140557
74177	CT Scans	Radiology Services	84987678	266150
74178	CT Scans	Radiology Services	42621145	93883

74181	MRI	Radiology Services	3834237	12717
74182	MRI	Radiology Services	329924	998
74183	MRI	Radiology Services	26177639	50124
74185	MRI	Radiology Services	533334	2084
74261	CT Scans	Radiology Services	436977	1959
74262	CT Scans	Radiology Services	52104	156
74712	MRI	Radiology Services		
75557	MRI	Radiology Services	175922	543
75559	MRI	Radiology Services	8603	37
75561	MRI	Radiology Services	1811111	3532
75563	MRI	Radiology Services	282396	432
75565	MRI	Radiology Services	38112	1622
75571	CT Scans	Radiology Services	305131	3984
75572	CT Scans	Radiology Services	1464269	4912
75573	CT Scans	Radiology Services	39408	121
75574	CT Scans	Radiology Services	3546845	10410
75635	CT Scans	Radiology Services	5451447	14734
76380	CT Scans	Radiology Services	166281	1987
76948	Infertility Services	Radiology Services		
77014	CT Scans	Radiology Services	28874427	366123
77021	MRI	Radiology Services	139206	565
77022	MRI	Radiology Services	16256	75
77058	MRI	Radiology Services	86674	317
77059	MRI	Radiology Services	3909020	14381
77084	MRI	Radiology Services	133515	404
77261	Radiation Oncology	Radiation Oncology Services	94622	1230
77262	Radiation Oncology	Radiation Oncology Services	62745	547
77263	Radiation Oncology	Radiation Oncology Services	8252324	49313
77280	Radiation Oncology	Radiation Oncology Services	13235649	57969
77285	Radiation Oncology	Radiation Oncology Services	358587	897
77290	Radiation Oncology	Radiation Oncology Services	17997940	42724
77293	Radiation Oncology	Radiation Oncology Services	1359653	4969
77295	Radiation Oncology	Radiation Oncology Services	27341992	27231
77299	Radiation Oncology	Radiation Oncology Services	3360	28
77300	Radiation Oncology	Radiation Oncology Services	27108376	68919
77301	Radiation Oncology	Radiation Oncology Services	39043909	23821
77306	Radiation Oncology	Radiation Oncology Services	364152	1079
77307	Radiation Oncology	Radiation Oncology Services	3304714	8706
77316	Radiation Oncology	Radiation Oncology Services	154533	937
77317	Radiation Oncology	Radiation Oncology Services	190867	657
77318	Radiation Oncology	Radiation Oncology Services	442153	1234
77321	Radiation Oncology	Radiation Oncology Services	814592	3424
77331	Radiation Oncology	Radiation Oncology Services	1233090	6849
77332	Radiation Oncology	Radiation Oncology Services	1587656	15328
77333	Radiation Oncology	Radiation Oncology Services	331785	2429
77334	Radiation Oncology	Radiation Oncology Services	44854288	78564
77336	Radiation Oncology	Radiation Oncology Services	21774762	206406
77338	Radiation Oncology	Radiation Oncology Services	14234909	28323

77370	Radiation Oncology	Radiation Oncology Services	1307922	10379
77371	Radiation Oncology	Radiation Oncology Services	7259793	953
77372	Radiation Oncology	Radiation Oncology Services	7562465	1123
77373	Radiation Oncology	Radiation Oncology Services	41736424	24663
77385	Radiation Oncology	Radiation Oncology Services	66560130	128931
77386	Radiation Oncology	Radiation Oncology Services	99854308	191494
77387	Radiation Oncology	Radiation Oncology Services	16902483	76378
77399	Radiation Oncology	Radiation Oncology Services	118182	989
77401	Radiation Oncology	Radiation Oncology Services	923737	30149
77402	Radiation Oncology	Radiation Oncology Services	326344	2700
77407	Radiation Oncology	Radiation Oncology Services	82077	683
77412	Radiation Oncology	Radiation Oncology Services	60657397	279827
77417	Radiation Oncology	Radiation Oncology Services	1634722	47284
77423	Radiation Oncology	Radiation Oncology Services		
77424	Radiation Oncology	Radiation Oncology Services	1023413	148
77425	Radiation Oncology	Radiation Oncology Services	192546	25
77427	Radiation Oncology	Radiation Oncology Services	37489038	198651
77431	Radiation Oncology	Radiation Oncology Services	81095	768
77432	Radiation Oncology	Radiation Oncology Services	822820	1924
77435	Radiation Oncology	Radiation Oncology Services	3670363	5682
77469	Radiation Oncology	Radiation Oncology Services	55059	165
77470	Radiation Oncology	Radiation Oncology Services	6837027	18109
77520	Proton Beam Radiotherapy	Radiation Oncology Services	329869	387
77522	Proton Beam Radiotherapy	Radiation Oncology Services	5919915	6219
77523	Proton Beam Radiotherapy	Radiation Oncology Services	14996081	14430
77525	Proton Beam Radiotherapy	Radiation Oncology Services	2578523	2306
77600	Radiation Oncology	Radiation Oncology Services	343315	812
77605	Radiation Oncology	Radiation Oncology Services	23926	28
77615	Radiation Oncology	Radiation Oncology Services		
77750	Radiation Oncology	Radiation Oncology Services	50927	150
77761	Radiation Oncology	Radiation Oncology Services		
77762	Radiation Oncology	Radiation Oncology Services		
77763	Radiation Oncology	Radiation Oncology Services		
77767	Radiation Oncology	Radiation Oncology Services	175509	724
77768	Radiation Oncology	Radiation Oncology Services	492680	1480
77770	Radiation Oncology	Radiation Oncology Services	2107146	2923
77771	Radiation Oncology	Radiation Oncology Services	2908080	2725
77772	Radiation Oncology	Radiation Oncology Services	490024	489
77778	Radiation Oncology	Radiation Oncology Services	565957	899
77789	Radiation Oncology	Radiation Oncology Services	5479	54
77790	Radiation Oncology	Radiation Oncology Services	27111	246
77799	Radiation Oncology	Radiation Oncology Services	2817	22
78012	Nuclear Medicine	Radiology Services	126918	701
78013	Nuclear Medicine	Radiology Services	125673	541
78014	Nuclear Medicine	Radiology Services	1499533	5757
78015	Nuclear Medicine	Radiology Services	2388	20
78016	Nuclear Medicine	Radiology Services		
78018	Nuclear Medicine	Radiology Services	617218	1621

78020	Nuclear Medicine	Radiology Services	11461	305
78070	Nuclear Medicine	Radiology Services	898099	2939
78071	Nuclear Medicine	Radiology Services	529148	1736
78072	Nuclear Medicine	Radiology Services	776074	1767
78075	Nuclear Medicine	Radiology Services	24701	25
78102	Nuclear Medicine	Radiology Services	57643	221
78103	Nuclear Medicine	Radiology Services	11253	36
78104	Nuclear Medicine	Radiology Services	13560	53
78185	Nuclear Medicine	Radiology Services		
78195	Nuclear Medicine	Radiology Services	1328040	6007
78201	Nuclear Medicine	Radiology Services	153091	286
78202	Nuclear Medicine	Radiology Services	18938	41
78205	Nuclear Medicine	Radiology Services	572326	973
78206	Nuclear Medicine	Radiology Services	29851	84
78215	Nuclear Medicine	Radiology Services	136085	494
78216	Nuclear Medicine	Radiology Services	19985	84
78226	Nuclear Medicine	Radiology Services	1334616	5724
78227	Nuclear Medicine	Radiology Services	5028552	11674
78231	Nuclear Medicine	Radiology Services		
78232	Nuclear Medicine	Radiology Services		
78258	Nuclear Medicine	Radiology Services	15576	44
78261	Nuclear Medicine	Radiology Services		
78262	Nuclear Medicine	Radiology Services	12414	35
78264	Nuclear Medicine	Radiology Services	3931210	10689
78265	Nuclear Medicine	Radiology Services	58753	305
78266	Nuclear Medicine	Radiology Services	26132	48
78278	Nuclear Medicine	Radiology Services	86105	435
78290	Nuclear Medicine	Radiology Services	15963	47
78291	Nuclear Medicine	Radiology Services		
78300	Nuclear Medicine	Radiology Services	471938	1736
78305	Nuclear Medicine	Radiology Services	82760	355
78306	Nuclear Medicine	Radiology Services	17186183	49041
78315	Nuclear Medicine	Radiology Services	3736951	10192
78320	Nuclear Medicine	Radiology Services	1612164	4450
78414	Nuclear Medicine	Radiology Services	22079	69
78428	Nuclear Medicine	Radiology Services	4395	34
78445	Nuclear Medicine	Radiology Services	5314	25
78451	Nuclear Medicine	Radiology Services	4925018	7797
78452	Nuclear Medicine	Radiology Services	252665148	342790
78453	Nuclear Medicine	Radiology Services	92315	238
78454	Nuclear Medicine	Radiology Services	318659	1483
78457	Nuclear Medicine	Radiology Services		
78458	Nuclear Medicine	Radiology Services		
78459	Nuclear Medicine	Radiology Services	558729	417
78466	Nuclear Medicine	Radiology Services	21470	89
78468	Nuclear Medicine	Radiology Services		
78469	Nuclear Medicine	Radiology Services	55185	108
78472	Nuclear Medicine	Radiology Services	1335068	4470

78473	Nuclear Medicine	Radiology Services	102950	336
78481	Nuclear Medicine	Radiology Services	38775	199
78483	Nuclear Medicine	Radiology Services	15649	37
78491	Nuclear Medicine	Radiology Services	228891	191
78492	Nuclear Medicine	Radiology Services	34563477	25483
78494	Nuclear Medicine	Radiology Services	57589	220
78496	Nuclear Medicine	Radiology Services	11497	150
78579	Nuclear Medicine	Radiology Services	32595	120
78580	Nuclear Medicine	Radiology Services	181794	751
78582	Nuclear Medicine	Radiology Services	3181883	8882
78597	Nuclear Medicine	Radiology Services	91449	319
78598	Nuclear Medicine	Radiology Services	249585	676
78600	Nuclear Medicine	Radiology Services		
78601	Nuclear Medicine	Radiology Services		
78605	Nuclear Medicine	Radiology Services		
78606	Nuclear Medicine	Radiology Services		
78607	Nuclear Medicine	Radiology Services	2696185	2832
78608	Nuclear Medicine	Radiology Services	2422936	1941
78610	Nuclear Medicine	Radiology Services		
78630	Nuclear Medicine	Radiology Services	111911	349
78635	Nuclear Medicine	Radiology Services		
78645	Nuclear Medicine	Radiology Services	81406	181
78647	Nuclear Medicine	Radiology Services		
78650	Nuclear Medicine	Radiology Services		
78660	Nuclear Medicine	Radiology Services	10432	34
78700	Nuclear Medicine	Radiology Services	10469	56
78701	Nuclear Medicine	Radiology Services	28277	111
78707	Nuclear Medicine	Radiology Services	462591	1254
78708	Nuclear Medicine	Radiology Services	1373677	3665
78709	Nuclear Medicine	Radiology Services	265125	714
78710	Nuclear Medicine	Radiology Services		
78725	Nuclear Medicine	Radiology Services	38402	256
78730	Nuclear Medicine	Radiology Services		
78740	Nuclear Medicine	Radiology Services		
78761	Nuclear Medicine	Radiology Services		
78800	Nuclear Medicine	Radiology Services	96159	730
78801	Nuclear Medicine	Radiology Services	51638	200
78802	Nuclear Medicine	Radiology Services	453075	797
78803	Nuclear Medicine	Radiology Services	772520	2261
78804	Nuclear Medicine	Radiology Services	935966	1097
78805	Nuclear Medicine	Radiology Services	714756	971
78806	Nuclear Medicine	Radiology Services	659559	830
78807	Nuclear Medicine	Radiology Services	90246	266
78811	Nuclear Medicine	Radiology Services	95162	108
78812	Nuclear Medicine	Radiology Services	963800	913
78813	Nuclear Medicine	Radiology Services	304557	253
78814	Nuclear Medicine	Radiology Services	3484305	2648
78815	Nuclear Medicine	Radiology Services	152437267	112333

78816	Nuclear Medicine	Radiology Services	18159960	14055
81162	BRCA Genetic Testing	Other Services	9808639	3932
81211	BRCA Genetic Testing	Other Services	1713127	811
81212	BRCA Genetic Testing	Other Services	31256	176
81213	BRCA Genetic Testing	Other Services	183768	316
81214	BRCA Genetic Testing	Other Services		
81215	BRCA Genetic Testing	Other Services		
81217	BRCA Genetic Testing	Other Services		
89250	Infertility Services	Other Services		
89254	Infertility Services	Other Services		
89255	Infertility Services	Other Services		
89257	Infertility Services	Other Services		
89258	Infertility Services	Other Services		
89280	Infertility Services	Other Services		
89342	Infertility Services	Other Services		
90378	Synagis	Other/Multispecialty Drugs	0	0
91110	Capsule Endoscopy	Other Services	7359705	10830
91111	Capsule Endoscopy	Other Services	19287	44
92970	Left Ventricular Assist Devices	Cardiac Services		
93303	Echocardiogram	Radiology Services	808970	2321
93304	Echocardiogram	Radiology Services	81747	344
93306	Echocardiogram	Radiology Services	287601708	932879
93307	Echocardiogram	Radiology Services	1233557	4706
93308	Echocardiogram	Radiology Services	3441578	25299
93350	Echocardiogram	Radiology Services	7128938	21513
93351	Echocardiogram	Radiology Services	15255983	48550
93451	Cardiac Catheterization	Cardiac Services	10889545	4606
93452	Cardiac Catheterization	Cardiac Services	789145	587
93453	Cardiac Catheterization	Cardiac Services	871775	486
93454	Cardiac Catheterization	Cardiac Services	25968437	13112
93455	Cardiac Catheterization	Cardiac Services	5922220	3208
93456	Cardiac Catheterization	Cardiac Services	6059335	2474
93457	Cardiac Catheterization	Cardiac Services	1072127	497
93458	Cardiac Catheterization	Cardiac Services	123551750	55081
93459	Cardiac Catheterization	Cardiac Services	22898436	11294
93460	Cardiac Catheterization	Cardiac Services	31235122	11866
93461	Cardiac Catheterization	Cardiac Services	4866098	2045
93530	Cardiac Catheterization	Cardiac Services	36714	25
93531	Cardiac Catheterization	Cardiac Services	155206	58
93532	Cardiac Catheterization	Cardiac Services		
93533	Cardiac Catheterization	Cardiac Services		
95782	Sleep Studies	Sleep Medicine		
95783	Sleep Studies	Sleep Medicine		
95805	Sleep Studies	Sleep Medicine	468301	872
95807	Sleep Studies	Sleep Medicine	442349	1130
95808	Sleep Studies	Sleep Medicine	114529	177
95810	Sleep Studies	Sleep Medicine	49151698	68380
95811	Sleep Studies	Sleep Medicine	61500270	83293

99183	Hyperbaric Oxygen Therapy	Other Services	10059526	87690
A0430	Air Ambulance	DME or Transport	12646737	2908
A0435	Air Ambulance	DME or Transport	6943936	2899
A9606	Xofigo	Hematology/Oncology Drugs	37182829	2205
C1767	Dorsal Column Neurostimulators ^b	Musculoskeletal Services	17224308	1002
C1816	Dorsal Column Neurostimulators ^b	Musculoskeletal Services		
C1820	Dorsal Column Neurostimulators ^b	Musculoskeletal Services	32806689	1830
C1821	Spinal Fusion	Musculoskeletal Services	904134	283
C1822	Dorsal Column Neurostimulators ^b	Musculoskeletal Services	6492777	511
C8900	MRI	Radiology Services	91382	206
C8901	MRI	Radiology Services	85580	230
C8902	MRI	Radiology Services	402863	694
C8903	MRI	Radiology Services		
C8904	MRI	Radiology Services	8294	34
C8905	MRI	Radiology Services	71098	156
C8906	MRI	Radiology Services	157909	355
C8907	MRI	Radiology Services	117831	243
C8908	MRI	Radiology Services	3622125	7933
C8909	MRI	Radiology Services	132155	252
C8910	MRI	Radiology Services	39081	158
C8911	MRI	Radiology Services	331583	640
C8912	MRI	Radiology Services	86952	133
C8913	MRI	Radiology Services	20059	53
C8914	MRI	Radiology Services	136837	219
C8918	MRI	Radiology Services	23494	49
C8919	MRI	Radiology Services	19246	40
C8920	MRI	Radiology Services	115121	209
C8932	MRI	Radiology Services		
C8933	MRI	Radiology Services		
C8934	MRI	Radiology Services		
C8935	MRI	Radiology Services		
C8936	MRI	Radiology Services		
C9399	Unlisted (drugs\med inj)	Other/Multispecialty Drugs	44947804	5236
C9483	PD1\PDL1 Drugs	Hematology/Oncology Drugs	25303284	2837
C9487	Immunologic Agents	Other/Multispecialty Drugs	116783	27
C9489	Independent Drug	Neurology Drugs		
C9491	PD1\PDL1 Drugs	Hematology/Oncology Drugs	276082	48
C9492	PD1\PDL1 Drugs	Hematology/Oncology Drugs	475942	83
C9493	Independent Drug	Neurology Drugs	342538	305
C9494	Multiple Sclerosis Drugs	Neurology Drugs	10175204	540
C9741	Cardiac Catheterization	Cardiac Services	7910237	266
E0983	Motorized wheelchair	DME or Transport		
E1007	Motorized wheelchair	DME or Transport	16358898	2095
G0259	Pain Management	Musculoskeletal Services	55369	105
G0260	Pain Management	Musculoskeletal Services	13043937	31057
G0277	Hyperbaric Oxygen Therapy	Other Services	36223528	83485
G0297	CT Scans	Radiology Services	4223374	28675
G0339	Radiation Oncology	Radiation Oncology Services	1073686	368

G0340	Radiation Oncology	Radiation Oncology Services	2690849	1162
G6001	Radiation Oncology	Radiation Oncology Services	351933	7895
G6002	Radiation Oncology	Radiation Oncology Services	10843547	250290
G6003	Radiation Oncology	Radiation Oncology Services	11242	62
G6004	Radiation Oncology	Radiation Oncology Services	77407	511
G6005	Radiation Oncology	Radiation Oncology Services	78908	545
G6006	Radiation Oncology	Radiation Oncology Services	8022	57
G6007	Radiation Oncology	Radiation Oncology Services	31132	117
G6008	Radiation Oncology	Radiation Oncology Services	31675	166
G6009	Radiation Oncology	Radiation Oncology Services	16475	78
G6010	Radiation Oncology	Radiation Oncology Services		
G6011	Radiation Oncology	Radiation Oncology Services	844180	2924
G6012	Radiation Oncology	Radiation Oncology Services	19994124	74689
G6013	Radiation Oncology	Radiation Oncology Services	12975188	49860
G6014	Radiation Oncology	Radiation Oncology Services	1445745	5406
G6015	Radiation Oncology	Radiation Oncology Services	83144822	237039
G6016	Radiation Oncology	Radiation Oncology Services	579666	1647
J0129	Immunologic Agents	Rheumatology Drugs	142409704	40995
J0135	Immunologic Agents	Rheumatology Drugs		
J0178	Ophthalmic medical injectables	Other/Multispecialty Drugs	492855483	228976
J0180	Enzyme Replacement Drugs	Other/Multispecialty Drugs	10186510	802
J0202	Multiple Sclerosis Drugs	Neurology Drugs	10689514	555
J0221	Enzyme Replacement Drugs	Other/Multispecialty Drugs	10511288	385
J0256	Alpha 1- Proteinase Inhibitor - Human	Hematology/Oncology Drugs	22910252	8845
J0257	Alpha 1- Proteinase Inhibitor - Human	Hematology/Oncology Drugs	1642545	808
J0490	Benlysta	Rheumatology Drugs	17885845	5175
J0585	Botulinum Toxin Type A	Neurology Drugs	68819693	62097
J0586	Botulinum Toxin Type A	Neurology Drugs	1563717	1284
J0587	Botulinum Toxin Type B	Neurology Drugs	1591254	1728
J0588	Botulinum Toxin Type A	Neurology Drugs	2651690	2998
J0596	Hereditary Angioedema Drugs	Other/Multispecialty Drugs	46175	22
J0597	Hereditary Angioedema Drugs	Other/Multispecialty Drugs	906097	122
J0598	Hereditary Angioedema Drugs	Other/Multispecialty Drugs	258758	90
J0630	Osteoporosis Drugs	Other/Multispecialty Drugs		
J0638	Ilaris	Rheumatology Drugs		
J0641	Fusilev	Hematology/Oncology Drugs	3062984	6606
J0717	Immunologic Agents	Rheumatology Drugs	58207798	20394
J0725	Injectable Infertility Medications	Other/Multispecialty Drugs	81703	1839
J0800	Acthar Gel	Rheumatology Drugs		
J0881	Darbepoetin Alpha, Epoetin Alpha	Hematology/Oncology Drugs	57648493	65947
J0882	Darbepoetin Alpha, Epoetin Alpha	Hematology/Oncology Drugs	117516479	383886
J0885	Darbepoetin Alpha, Epoetin Alpha	Hematology/Oncology Drugs	62465908	136007
J0887	Darbepoetin Alpha, Epoetin Alpha	Hematology/Oncology Drugs	883910819	278998
J0888	Darbepoetin Alpha, Epoetin Alpha	Hematology/Oncology Drugs	28100	47
J0897	Osteoporosis Drugs	Other/Multispecialty Drugs	254387079	193197
J1290	Hereditary Angioedema Drugs	Other/Multispecialty Drugs		
J1300	Soliris	Other/Multispecialty Drugs	50850053	2160
J1325	Pulmonary Arterial Hypertension Drugs	Cardiovascular Drugs	4203576	1555

J1438	Immunologic Agents	Rheumatology Drugs	65280	71
J1442	Granulocyte-colony stimulating factor	Hematology/Oncology Drugs	12579491	29573
J1447	Granulocyte-colony stimulating factor	Hematology/Oncology Drugs	3630947	12983
J1453	Anti Emetics	Hematology/Oncology Drugs	18577766	63440
J1459	Immunoglobulins	Other/Multispecialty Drugs	56456771	18317
J1460	Immunoglobulins	Other/Multispecialty Drugs	47129	337
J1556	Immunoglobulins	Other/Multispecialty Drugs	361650	118
J1557	Immunoglobulins	Other/Multispecialty Drugs	7310297	2425
J1559	Immunoglobulins	Other/Multispecialty Drugs	25560821	6557
J1560	Immunoglobulins	Other/Multispecialty Drugs	14329	59
J1561	Immunoglobulins	Other/Multispecialty Drugs	55366906	17953
J1566	Immunoglobulins	Other/Multispecialty Drugs	13192909	5375
J1568	Immunoglobulins	Other/Multispecialty Drugs	35559607	14041
J1569	Immunoglobulins	Other/Multispecialty Drugs	71899772	23172
J1572	Immunoglobulins	Other/Multispecialty Drugs	9680140	4018
J1575	Immunoglobulins	Other/Multispecialty Drugs	8376608	1726
J1595	Multiple Sclerosis Drugs	Neurology Drugs	43272	223
J1599	Immunoglobulins	Other/Multispecialty Drugs	153385	32
J1602	Immunologic Agents	Other/Multispecialty Drugs	44022940	10104
J1725	Makena	Other/Multispecialty Drugs	34997	77
J1744	Hereditary Angioedema Drugs	Other/Multispecialty Drugs		
J1745	Immunologic Agents	Other/Multispecialty Drugs	276017565	64557
J1786	Enzyme Replacement Drugs	Other/Multispecialty Drugs	7827818	533
J1826	Multiple Sclerosis Drugs	Neurology Drugs	14655	41
J1931	Enzyme Replacement Drugs	Other/Multispecialty Drugs	562812	44
J2182	Nucala	Other/Multispecialty Drugs	11811440	4320
J2323	Multiple Sclerosis Drugs	Neurology Drugs	63815888	11280
J2357	Respiratory Injectables	Other/Multispecialty Drugs	73599195	35323
J2503	Ophthalmic medical injectables	Other/Multispecialty Drugs	38197	43
J2505	Granulocyte-colony stimulating factor	Hematology/Oncology Drugs	278531137	65779
J2507	Krystexxa	Rheumatology Drugs	7299350	519
J2778	Ophthalmic medical injectables	Other/Multispecialty Drugs	208337337	103768
J2786	Respiratory Injectables	Other/Multispecialty Drugs	1484409	600
J2820	Granulocyte-colony stimulating factor	Hematology/Oncology Drugs	971249	2739
J3060	Enzyme Replacement Drugs	Other/Multispecialty Drugs	3032495	132
J3110	Osteoporosis Drugs	Other/Multispecialty Drugs	381185	27
J3262	Immunologic Agents	Other/Multispecialty Drugs	44529779	18897
J3285	Pulmonary Arterial Hypertension Drugs	Cardiovascular Drugs	34318848	1967
J3357	Immunologic Agents	Other/Multispecialty Drugs	19027269	1704
J3380	Immunologic Agents	Other/Multispecialty Drugs	38041643	7080
J3385	Enzyme Replacement Drugs	Other/Multispecialty Drugs	5043142	386
J3490	Unlisted (drugs\med inj)	Other/Multispecialty Drugs	22108890	243023
J3590	Unlisted (drugs\med inj)	Other/Multispecialty Drugs	19314115	47872
J7175	Blood Clotting Factor	Hematology/Oncology Drugs		
J7178	Blood Clotting Factor	Hematology/Oncology Drugs	240278	45
J7179	Blood Clotting Factor	Hematology/Oncology Drugs	2171603	20
J7180	Blood Clotting Factor	Hematology/Oncology Drugs		
J7181	Blood Clotting Factor	Hematology/Oncology Drugs		

J7182	Blood Clotting Factor	Hematology/Oncology Drugs	267041	46
J7183	Blood Clotting Factor	Hematology/Oncology Drugs	613524	34
J7185	Blood Clotting Factor	Hematology/Oncology Drugs	692970	27
J7186	Blood Clotting Factor	Hematology/Oncology Drugs	397116	51
J7187	Blood Clotting Factor	Hematology/Oncology Drugs	7605874	552
J7189	Blood Clotting Factor	Hematology/Oncology Drugs	2461235	40
J7190	Blood Clotting Factor	Hematology/Oncology Drugs	3663217	104
J7192	Blood Clotting Factor	Hematology/Oncology Drugs	37975490	1022
J7193	Blood Clotting Factor	Hematology/Oncology Drugs	1238022	47
J7194	Blood Clotting Factor	Hematology/Oncology Drugs	77366	21
J7195	Blood Clotting Factor	Hematology/Oncology Drugs	11823655	404
J7196	Blood Clotting Factor	Hematology/Oncology Drugs		
J7197	Blood Clotting Factor	Hematology/Oncology Drugs		
J7198	Blood Clotting Factor	Hematology/Oncology Drugs	8915207	121
J7199	Blood Clotting Factor	Hematology/Oncology Drugs		
J7200	Blood Clotting Factor	Hematology/Oncology Drugs	1073855	33
J7201	Blood Clotting Factor	Hematology/Oncology Drugs	7899414	154
J7202	Blood Clotting Factor	Hematology/Oncology Drugs	1570621	49
J7205	Blood Clotting Factor	Hematology/Oncology Drugs	13976591	327
J7207	Blood Clotting Factor	Hematology/Oncology Drugs	5772779	78
J7209	Blood Clotting Factor	Hematology/Oncology Drugs		
J7320	Viscosupplementation	Other/Multispecialty Drugs	2959341	11991
J7321	Viscosupplementation	Other/Multispecialty Drugs	12131156	108397
J7322	Viscosupplementation	Other/Multispecialty Drugs	734189	1304
J7323	Viscosupplementation	Other/Multispecialty Drugs	14092721	68012
J7324	Viscosupplementation	Other/Multispecialty Drugs	15851161	79103
J7325	Viscosupplementation	Other/Multispecialty Drugs	27008077	49374
J7326	Viscosupplementation	Other/Multispecialty Drugs	5188136	7217
J7327	Viscosupplementation	Other/Multispecialty Drugs	11266545	9982
J7328	Viscosupplementation	Other/Multispecialty Drugs	3914172	8601
J7686	Pulmonary Arterial Hypertension Drugs	Cardiovascular Drugs	38294804	2558
J7799	Unlisted (drugs\med inj)	Other/Multispecialty Drugs	7552650	2271
J8499	Unlisted (drugs\med inj)	Other/Multispecialty Drugs	43151	86
J8521	Xeloda	Hematology/Oncology Drugs	1001	24
J9042	Adcetris	Rheumatology Drugs	18163612	1030
J9055	Erbitux	Hematology/Oncology Drugs	38818457	12095
J9145	Darzalex	Hematology/Oncology Drugs	86620809	14619
J9176	Empliciti	Hematology/Oncology Drugs	15633439	3152
J9228	Yervoy	Hematology/Oncology Drugs	47856604	1213
J9271	PD1\PDL1 Drugs	Hematology/Oncology Drugs	205136894	22591
J9299	PD1\PDL1 Drugs	Hematology/Oncology Drugs	294218826	48614
J9301	Gazyva	Hematology/Oncology Drugs	16232601	3112
J9303	Vectibix	Hematology/Oncology Drugs	16206017	3249
J9306	HER2 Receptor Targeted Drugs	Hematology/Oncology Drugs	44454615	9026
J9308	Cyramza	Hematology/Oncology Drugs	19948067	2817
J9310	Immunologic Agents	Other/Multispecialty Drugs	350445763	53811
J9325	Imlygic	Hematology/Oncology Drugs	2740532	343
J9354	HER2 Receptor Targeted Drugs	Hematology/Oncology Drugs	23020501	2945

J9355	HER2 Receptor Targeted Drugs	Hematology/Oncology Drugs	153005551	39049
J9400	Zaltrap	Hematology/Oncology Drugs	713283	255
J9999	Unlisted (drugs\med inj)	Other/Multispecialty Drugs	20168149	3659
K0010	Motorized wheelchair	DME or Transport		
K0011	Motorized wheelchair	DME or Transport		
K0800	Motorized wheelchair	DME or Transport	841235	2488
K0801	Motorized wheelchair	DME or Transport	153097	256
K0802	Motorized wheelchair	DME or Transport		
K0806	Motorized wheelchair	DME or Transport		
K0814	Motorized wheelchair	DME or Transport	7786	43
K0815	Motorized wheelchair	DME or Transport	6635	37
K0816	Motorized wheelchair	DME or Transport	639927	4027
K0820	Motorized wheelchair	DME or Transport		
K0821	Motorized wheelchair	DME or Transport	515717	2885
K0822	Motorized wheelchair	DME or Transport	567545	3580
K0823	Motorized wheelchair	DME or Transport	6065890	39500
K0824	Motorized wheelchair	DME or Transport	132199	577
K0825	Motorized wheelchair	DME or Transport	1678692	7720
K0826	Motorized wheelchair	DME or Transport	14075	36
K0827	Motorized wheelchair	DME or Transport	224502	622
K0828	Motorized wheelchair	DME or Transport		
K0829	Motorized wheelchair	DME or Transport		
K0835	Motorized wheelchair	DME or Transport	469281	274
K0836	Motorized wheelchair	DME or Transport	141573	61
K0837	Motorized wheelchair	DME or Transport	84694	33
K0838	Motorized wheelchair	DME or Transport		
K0839	Motorized wheelchair	DME or Transport		
K0841	Motorized wheelchair	DME or Transport	221168	88
K0842	Motorized wheelchair	DME or Transport	145738	64
K0843	Motorized wheelchair	DME or Transport	89463	33
K0848	Motorized wheelchair	DME or Transport	703374	149
K0849	Motorized wheelchair	DME or Transport	721598	164
K0850	Motorized wheelchair	DME or Transport		
K0851	Motorized wheelchair	DME or Transport		
K0852	Motorized wheelchair	DME or Transport		
K0856	Motorized wheelchair	DME or Transport	3899804	757
K0857	Motorized wheelchair	DME or Transport		
K0858	Motorized wheelchair	DME or Transport	238977	40
K0859	Motorized wheelchair	DME or Transport		
K0860	Motorized wheelchair	DME or Transport		
K0861	Motorized wheelchair	DME or Transport	10772023	2029
K0862	Motorized wheelchair	DME or Transport	729102	108
K0863	Motorized wheelchair	DME or Transport		
L5856	Lower Limb Prosthetics	DME or Transport	7252079	313
L5858	Lower Limb Prosthetics	DME or Transport	568695	31
L5859	Lower Limb Prosthetics	DME or Transport		
L5987	Lower Limb Prosthetics	DME or Transport	4609475	623
L5999	Lower Limb Prosthetics	DME or Transport	124907	126
L8614	Cochlear Device and/or Implantation	Ear/Nose/Throat Services	14357434	628

L8619	Cochlear Device and/or Implantation	Ear/Nose/Throat Services	5484867	643
L8690	Osseointegrated Implant	Ear/Nose/Throat Services	1028334	201
L8691	Osseointegrated Implant	Ear/Nose/Throat Services	738486	284
L8693	Osseointegrated Implant	Ear/Nose/Throat Services		
Q2043	Provenge	Hematology/Oncology Drugs	39511583	1006
Q3027	Multiple Sclerosis Drugs	Neurology Drugs	681701	599
Q4074	Pulmonary Arterial Hypertension Drugs	Cardiovascular Drugs	3821526	170
Q4081	Darbepoetin Alpha, Epoetin Alpha	Hematology/Oncology Drugs	558056882	2036194
Q5101	Granulocyte-colony stimulating factor	Hematology/Oncology Drugs	7519213	23864
Q5102	Immunologic Agents	Other/Multispecialty Drugs	7334833	1929
Q9986	Independent Drug	Other/Multispecialty Drugs	10643	36
Q9989	Immunologic Agents	Other/Multispecialty Drugs	580999	125

^a Per Center for Medicare and Medicaid Services cell size suppression policy, cells are suppressed if the annual count is 10 or less and are counter-suppressed if the count is between 10 and 20.

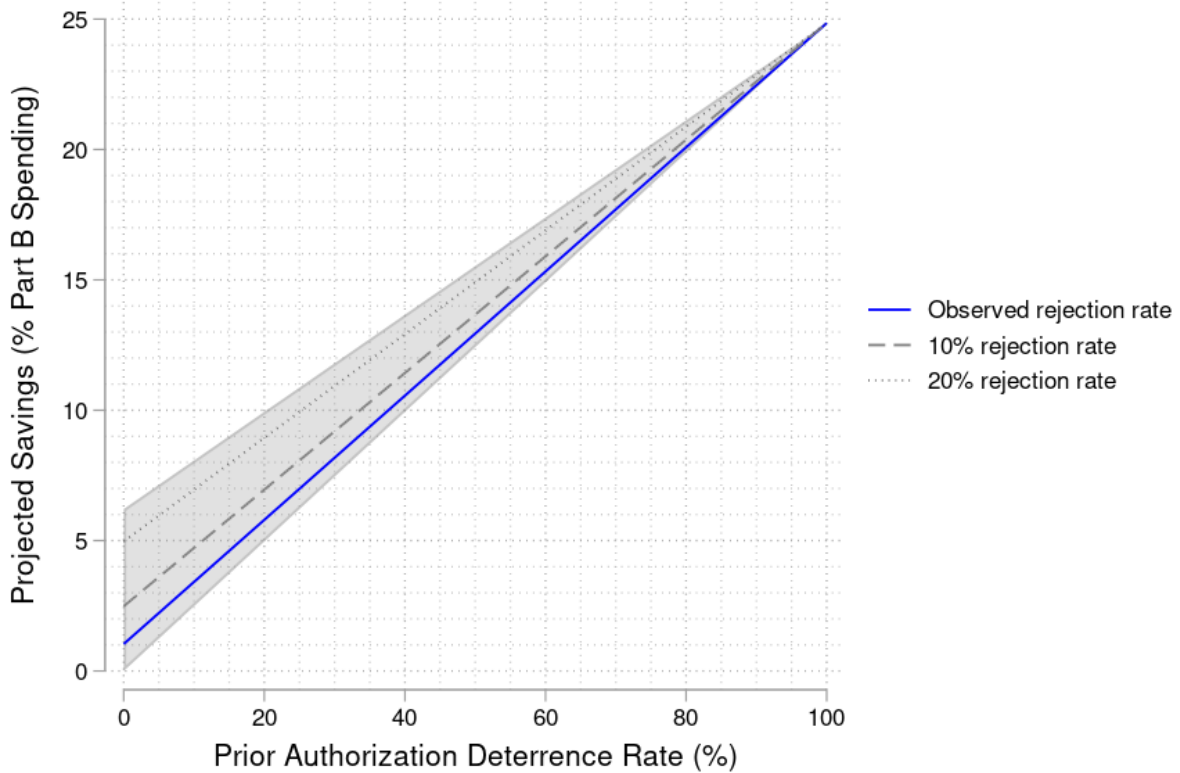
^b Per prior authorization rules, claim lines C-codes for dorsal column neurostimulators were only included in the analysis if accompanied in the claim by another neurostimulator procedure code that was not a C-code.

eTable2: Clinician Annual Risk of PA Service, by Specialty					
Clinician Specialty^a	Clinician Count	% with a PA Service	95% CI		
Addiction medicine	231	8.7%	5.0%	-	12.3%
Allergy/immunology	3870	44.4%	42.9%	-	46.0%
Anesthesiology	40854	23.7%	23.3%	-	24.1%
Cardiac Electrophysiology	1187	97.1%	96.2%	-	98.1%
Cardiac surgery	819	69.2%	66.1%	-	72.4%
Cardiology	22903	92.6%	92.2%	-	92.9%
Colorectal surgery	884	60.7%	57.5%	-	64.0%
Critical care (intensivists)	3081	25.8%	24.3%	-	27.4%
Dermatology	12247	12.4%	11.9%	-	13.0%
Diagnostic radiology	31232	91.1%	90.8%	-	91.4%
Emergency medicine	39911	50.1%	49.6%	-	50.5%
Endocrinology	4228	60.4%	58.9%	-	61.9%
Gastroenterology	14653	76.9%	76.3%	-	77.6%
General practice	245750	58.5%	58.3%	-	58.7%
General surgery	25916	70.0%	69.4%	-	70.6%
Geriatric psychiatry	172	11.0%	6.4%	-	15.7%
Geriatric medicine	1271	42.6%	39.9%	-	45.4%
Gynecologist/oncologist	415	74.0%	69.8%	-	78.2%
Hand surgery	960	61.3%	58.2%	-	64.3%
Hematology/oncology	8150	87.8%	87.1%	-	88.5%
Hospice and Palliative Care	1067	12.0%	10.0%	-	13.9%
Infectious disease	4467	33.4%	32.0%	-	34.8%
Interventional Pain Management	1769	90.9%	89.6%	-	92.2%
Interventional cardiology	3316	98.6%	98.2%	-	99.0%
Interventional radiology	1306	83.2%	81.2%	-	85.3%
Maxillofacial surgery	923	21.8%	19.1%	-	24.4%
Nephrology	3468	73.6%	72.1%	-	75.1%
Neurology	15574	69.9%	69.2%	-	70.6%
Neuropsychiatry	98	31.6%	22.4%	-	40.8%
Neurosurgery	4945	89.6%	88.8%	-	90.5%
Nuclear medicine	574	93.9%	91.9%	-	95.9%
Obstetrics/gynecology	33611	18.7%	18.3%	-	19.2%
Ophthalmology	18361	43.6%	42.9%	-	44.4%
Orthopedic surgery	23674	85.0%	84.5%	-	85.4%
Osteopathic manipulative therapy	787	39.5%	36.1%	-	42.9%
Otolaryngology	9587	74.0%	73.1%	-	74.8%
Pain Management	1653	89.1%	87.6%	-	90.6%
Pathology	12238	2.4%	2.1%	-	2.7%
Pediatric medicine	6056	19.3%	18.3%	-	20.3%
Physical medicine and rehabilitation	8171	54.3%	53.2%	-	55.4%
Plastic and reconstructive surgery	4554	52.5%	51.1%	-	54.0%
Preventive medicine	442	18.8%	15.1%	-	22.4%
Psychiatry	27086	3.5%	3.3%	-	3.7%
Pulmonary disease	8806	77.8%	76.9%	-	78.6%
Radiation oncology	4654	97.4%	97.0%	-	97.9%

Rheumatology	3420	85.1%	83.9%	-	86.3%
Sleep medicine	754	90.2%	88.1%	-	92.3%
Sports medicine	833	80.9%	78.2%	-	83.6%
Surgical oncology	339	72.6%	67.8%	-	77.3%
Thoracic surgery	2113	75.1%	73.2%	-	76.9%
Urology	9598	84.2%	83.5%	-	84.9%
Vascular surgery	2392	81.7%	80.1%	-	83.2%

^a Table includes all physician specialties encompassing >0.01% of clinicians in sample. General practice includes clinicians in family practice, internal medicine, and hospital medicine.

eFigure: Projected Savings From Prior Authorization in Fee-For-Service Medicare



Notes: The figure illustrates projected gross savings on services qualifying for prior authorization under alternate scenarios. Scenarios vary according to the rate at which prior authorization applications are rejected, and the rate at which prior authorization services are deterred (i.e. without an application filed). The gray zone includes estimates with rejection rates ranging from 0% to 25%. The solid line assumes the observed average rejection rate of 4.2%.