Health Policy Review

Update of Utilization Patterns of Facet Joint Interventions in Managing Spinal Pain from 2000 to 2018 in the US Fee-for-Service Medicare Population

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Background: Interventional techniques for managing spinal pain, from conservative modalities to surgical interventions, are thought to have been growing rapidly. Interventional techniques take center stage in managing chronic spinal pain. Specifically, facet joint interventions experienced explosive growth rates from 2000 to 2009, with a reversal of these growth patterns and in some settings, a trend of decline after 2009.

Objectives: The objectives of this assessment of utilization patterns include providing an update of facet joint interventions in managing chronic spinal pain in the fee-for-service (FFS) Medicare population of the United States from 2000 to 2018.

Study Design: The study was designed to assess utilization patterns and variables of facet joint interventions in managing chronic spinal pain from 2000 to 2018 in the FFS Medicare population in the United States.

Methods: Data for the analysis were obtained from the master database from the Centers for Medicare & Medicaid Services (CMS) physician/supplier procedure summary from 2000 to 2018.

Results: Facet joint interventions increased 1.9% annually and 18.8% total from 2009 to 2018 per 100,000 FFS Medicare population compared with an annual increase of 17% and overall increase of 309.9% from 2000 to 2009.

Lumbosacral facet joint nerve block sessions or visits decreased at an annual rate of 0.2% from 2009 to 2018, with an increase of 15.2% from 2000 to 2009. In contrast, lumbosacral facet joint neurolysis sessions increased at an annual rate of 7.4% from 2009 to 2018, and the utilization rate also increased at an annual rate of 23.0% from 2000 to 2009. The proportion of lumbar facet joint blocks sessions to lumbosacral facet joint neurolysis sessions changed from 6.7 in 2000 to 1.9 in 2018. Cervical and thoracic facet joint injections increased at an annual rate of 0.5% compared with cervicothoracic facet neurolysis sessions of 8.7% from 2009 to 2018. Cervical facet joint injections increased to 4.9% from 2009 to 2018 compared with neurolysis procedures of 112%. The proportion of cervical facet joint injection sessions to neurolysis sessions changed from 8.9 in 2000 to 2.4 in 2018.

Limitations: This analysis is limited by inclusion of only the FFS Medicare population, without adding utilization patterns of Medicare Advantage plans, which constitutes almost 30% of the Medicare population.

The utilization data for individual states also continues to be sparse and may not be accurate.

Conclusions: Utilization patterns of facet joint interventions increased 1.9% per 100,000 Medicare population from 2009 to 2018. This results from an annual decline of - 0.2% lumbar facet joint injection sessions but with an increase of facet joint radiofrequency sessions of 7.4%.

Key words: Interventional techniques, facet joint interventions, facet joint nerve blocks, facet joint neurolysis

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The description of the US Burden of Disease Collaborations from 1990 to 2010 accounted for nearly half of the US health care burden to morbidity and to chronic disability (1). Health care costs continue to increase, specifically for spinal pain and musculoskeletal disorders, with estimates showing in 2013 of spending of $87.6 billion in managing low back and neck pain, with a total approximate spending of $183 billion, which also included musculoskeletal disorders (2). Further, in 2016, low back and neck pain expenditures increased to an estimated $134.5 billion, and $129.8 billion for musculoskeletal conditions with total spending of $264.3 billion, an increase of 44.4% from 2013 (3). This was the third highest amount of the various disease categories. At the same time, US health care spending has reached $3.65 trillion in 2018, which is of course concerning to the entire US population, administration, and Congress (4). Further, per person cost for health care increased to $11,212 in 2018 (5). It has been estimated that national health care spending will grow to nearly $6 trillion by 2027 (5).

To combat escalating increases in health care costs, multiple regulations have been enacted (6-12). The focus of policymakers, public, and payers continues to be on reducing the utilization and/or reimbursement rates to combat health care expenditures. In 2009 the Affordable Care Act (ACA) was enacted resulting in the most monumental shift in US health care policy since the passage of Medicare and Medicaid in 1965 (6). Even though the ACA was enacted with 3 primary goals of increase the number of insured, improving the quality of care, and controlling health care costs, it may have achieved only increasing the number of insured without affecting the quality or access to health care.

With treatment modalities being increasingly scrutinized, interventional techniques and facet joint interventions have been criticized for their utilization, lack of clinical cost utility, lack of medical necessity and indications. It should be noted that the challenge of utilization can escalate beyond simple cost. Over the past 2 decades, multiple modalities in pain management have shown significant escalation in utilization, including opioids, leading to an opioid epidemic and escalating deaths (12-32).

The utilization patterns of facet joint interventions have been well studied with overall increases until 2009 and a trend of decline since 2009 (30-37). These studies also showed the reversal of the ratio of lumbosacral facet joint injections compared with facet joint neurolytic procedures, decreasing from 6.7% in 2009 to 2.2% in 2016. Essentially, radiofrequency procedures have increased relative to facet joint nerve blocks and intraarticular injections. Further, trends in lumbar radiofrequency ablation utilization in the commercially insured population from 2007 to 2016, showed an increase of 2.5% of lumbar facet joint injection procedures annually from 2007 to 2016, whereas, radiofrequency neurotomy procedures increased annually from 35 to 53 per 100,000 enrollees. The total number of lumbar radiofrequency procedures performed per 100,000 enrollees per year similarly increased from 49 to 113, a 130.6% increase (9.7% annually). These authors showed that the number of patients receiving lumbar radiofrequency ablation per 100,000 enrollees per year increased from 35 to 53, a 51.4% overall increase or 4.7% annual increase. Similarly, the ratio of cervicothoracic facet joint injections compared with neurolytic procedures decreased from 8.85% in 2000 to 2.8% in 2016 (31). Recent analysis of utilization of interventional techniques from 2000-2018 (13), showed similar trends for facet joint interventions and sacroiliac joint blocks, with an annual increase of 0.9% with an overall increase of 8.1% per 100,000 Medicare population from 2009 to 2018.

Despite concerns having been raised about a perceived lack of clinical cost utility, appropriate indications and medical necessity literature continues to emerge. There are many studies demonstrating the clinical and cost utility of facet joint interventions in managing chronic spinal pain based on randomized controlled trials, systematic reviews, cost-utility analysis studies, and evidence from real-world scenarios (38-64). However, as described in many of the other manuscripts, discordant conclusions with negative recommendations, with lack of agreement between proponents and opponents of the literature of the effectiveness and appropriateness of facet joint interventions continues (42-46,60-68). Opponents continue to cite lack of effectiveness, with proponents emphasizing evidence and confluence of interest of authors involved in interpretation of these studies leading to inappropriate conclusions as the basis of discordant results. This also has led to multiple attempts to control the utilization patterns of facet joint interventions along with other interventional techniques by affecting coverage policies based on local coverage determinations (LCDs) in Medicare populations, increased oversight from Medicare, coding changes, and reimbursement reductions. These aspects continue to be augmented based on criticism from opponents of interventional techniques in general and facet joint injections in particular (37,48,67,68).

The present retrospective cohort study of utilization of patterns of facet joint interventions evaluates data from 2000 to 2018, updating our previous publications examining the utilization patterns in the US fee-for-service (FFS) Medicare population (30,31).

Methods

Utilizing the same methodology of utilization patterns of interventional techniques in multiple publications (30-36) including those on facet joint interventions (31), the present investigation describes an update of utilization patterns of all facet joint interventions in managing spinal pain from 2000 to 2018 was performed. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) was utilized for methodological inclusion (69). The Centers for Medicare and Medicaid Services (CMS) database (70) from public use files (PUF) or non-identifiable data, which is also non-attributable and non-confidential was utilized. Further, based on the nature of the study, analysis of official data from CMS, which is non-identifiable and non-confidential, and lack of involvement of patients and their identifications, Institutional Review Board (IRB) approval was not required.

Study Design

This analysis of utilization patterns of facet joint interventions was designed as a retrospective cohort study in FFS Medicare population in the United States from 2000 to 2018 (30,31,70).

Setting

The setting of this analysis involved review of the National Database of Specialty Usage Data files from the CMS (70).

Participants

Participants included all Medicare FFS recipients receiving or undergoing facet joint interventions. The Current Procedural Terminology (CPT) codes included in this analysis are listed in Table 1.

Table 1. *CPT codes utilized for facet joint interventions from 2000 to 2018*

CPT CODE	DESCRIPTION
CPT CODES FROM 2000 TO 2009	
64470	Injection, anesthetic agent and/or steroid, paravertebral facet joint or facet joint nerve; cervical or thoracic, single level
64472	Injection, anesthetic agent and/or steroid, paravertebral facet joint or facet joint nerve; cervical or thoracic, each additional level
64475	Injection, anesthetic agent and/or steroid, paravertebral facet joint or facet joint nerve; lumbar or sacral, single level
64476	Injection, anesthetic agent and/or steroid, paravertebral facet joint or facet joint nerve; lumbar or sacral, each additional level
CPT CODES FROM 2000 TO 2012	
64622	Destruction by neurolytic agent, paravertebral facet joint nerve; lumbar or sacral, single level
64623	Destruction by neurolytic agent, paravertebral facet joint nerve; lumbar or sacral, each additional level
64626	Destruction by neurolytic agent, paravertebral facet joint nerve; cervical or thoracic, single level
64627	Destruction by neurolytic agent, paravertebral facet joint nerve; cervical or thoracic, each additional level
CPT CODES FROM 2010 TO 2018	
64490	Injection(s), diagnostic or therapeutic agent, paravertebral facet (zygapophyseal) joint (or nerves innervating that joint) with image guidance (fluoroscopy or CT), cervical or thoracic; single level
64491	Injection(s), diagnostic or therapeutic agent, paravertebral facet (zygapophyseal) joint (or nerves innervating that joint) with image guidance (fluoroscopy or CT), cervical or thoracic; second level (List separately in addition to code for primary procedure)
64492	Injection(s), diagnostic or therapeutic agent, paravertebral facet (zygapophyseal) joint (or nerves innervating that joint) with image guidance (fluoroscopy or CT), cervical or thoracic; third and any additional level(s) (List separately in addition to code for primary procedure)
64493	Injection(s), diagnostic or therapeutic agent, paravertebral facet (zygapophyseal) joint (or nerves innervating that joint) with image guidance (fluoroscopy or CT), lumbar or sacral; single level
64494	Injection(s), diagnostic or therapeutic agent, paravertebral facet (zygapophyseal) joint (or nerves innervating that joint) with image guidance (fluoroscopy or CT), lumbar or sacral; second level (List separately in addition to code for primary procedure)
64495	Injection(s), diagnostic or therapeutic agent, paravertebral facet (zygapophyseal) joint (or nerves innervating that joint) with image guidance (fluoroscopy or CT), lumbar or sacral; third and any additional level(s) (List separately in addition to code for primary procedure)
CPT CODES FROM 2012 TO 2018	
64633	Destruction by neurolytic agent, paravertebral facet joint nerve(s), with imaging guidance (fluoroscopy or CT); cervical or thoracic, single facet joint

Table 1 (cont.). *CPT codes utilized for facet joint interventions from 2000 to 2018.*

CPT CODE	DESCRIPTION
64634	Destruction by neurolytic agent, paravertebral facet joint nerve(s), with imaging guidance (fluoroscopy or CT); cervical or thoracic, each additional facet joint (List separately in addition to code for primary procedure)
64635	Destruction by neurolytic agent, paravertebral facet joint nerve(s), with imaging guidance (fluoroscopy or CT); lumbar or sacral, single facet joint
64636	Destruction by neurolytic agent, paravertebral facet joint nerve(s), with imaging guidance (fluoroscopy or CT); lumbar or sacral, each additional facet joint

The data were calculated for overall services for each procedure, and the rate of services, based on utilization per 100,000 FFS Medicare beneficiaries.

Variables

The analysis of utilization patterns of facet joint interventions incorporated multiple variables with analysis for all procedures, utilization based on statewise and Medicare Administrative Contractors (MACs) and location of the service provided, either office-based, ambulatory surgery center-based, or hospital outpatient-based.

Data Sources

The data were obtained from the CMS physician/supplier procedure summary master data from 2000 through 2018 (70). This file provided 100% of the data on all FFS Medicare participants irrespective of their age.

Measures

Allowed services were assessed for each procedure, and rates were calculated based on Medicare beneficiaries for the corresponding year and are reported as procedures per 100,000 Medicare beneficiaries. Data were assessed for total number of procedures performed, as well as number of visits or sessions for lumbar facet joint interventions. A session or visit is considered as one per region, these are also termed encounters or episodes, irrespective of number of procedures performed, whereas, procedures include multiple procedures performed during the same visit or session. Allowed services included all the services submitted minus services denied and services with zero payments.

Bias

Data were purchased from the CMS by the American Society of Interventional Pain Physicians (ASIPP). The study was conducted with the internal resources of the primary author's practice without external funding. That dataset from CMS included 100% usage by CPT codes. Additionally, data provided modifier usage of additional procedure or bilateral procedure, specialty codes, place of service, Medicare carrier number, total services, and allowed and denied services without identification of individuals denied claims.

Consequently, based on the large size of the dataset derived from a government source, there was no information related to patient individual identification, no resources were utilized from sources with conflicts, overall bias was minimized in this analysis and publication of the manuscript.

Study Size

The size of this retrospective cohort study is considered as large, providing real-world claims data on Medicare patients with inclusion of all Medicare FFS patients undergoing facet joint interventions for spinal pain from 2000 to 2018.

Data Compilation

Data were compiled utilizing Microsoft Access 2010 and Microsoft Excel 2010 (Microsoft, Redmond, WA).

Results

Participants

Participant population was derived from all Medicare FFS Medicare recipients from 2000 to 2018.

Descriptive Data of Population Characteristics

Table 2 shows descriptive data from 2000 to 2018. From 2009 to 2018, the US population older than 65 years of age increased at an annual rate of 3.2% compared with an annual growth of 1.3% from 2000 to 2009. The total US population also grew at an annual rate of 0.9% from 2000 to 2009 compared with 0.7% from 2009 to 2018. The number of individuals participating in Medicare also increased at an annual rate of 1.6% from 2000 to 2009 and 3% from 2009 to 2018 with an overall increase of 2.2% from 2000 to 2018.

Further, the number of encounters for facet joint

Table 2. *Characteristics of FFS Medicare beneficiaries and facet joint interventions from 2000 to 2018.*

	US Population			Medicare Beneficiaries				Facet Joint Interventions*			
	Total Population (,000)	≥ 65 Years (,000)		Number (,000)	% to US population	≥ 65 years (,000) (%)	< 65 years (,000) %	Services*	Rate Per 100,000	Primary Sessions or Visits	Rate Per 100,000
		Number	Percent								
2000	282,172	35,077	12.4%	39,632	14.0%	34,262 (86.5%)	5,370 (13.5%)	375,242 (68%)	947	144,157	364
2001	285,040	35,332	12.4%	40,045	14.0%	34,478 (86.1%)	5,567 (13.9%)	457,845 (64%)	1,143	178,341	445
2002	288,369	35,605	12.3%	40,503	14.0%	34,698 (85.7%)	5,805 (14.3%)	606,437 (60%)	1,497	228,489	564
2003	290,211	35,952	12.4%	41,126	14.2%	35,050 (85.2%)	6,078 (14.8%)	755,171 (55%)	1,836	281,413	684
2004	292,892	36,302	12.4%	41,729	14.2%	35,328 (84.7%)	6,402 (15.3%)	1,181,538 (47%)	2,831	431,758	1,035
2005	295,561	36,752	12.4%	42,496	14.4%	35,777 (84.2%)	6,723 (15.8%)	1,312,616 (47%)	3,089	477,942	1,125
2006	299,395	37,264	12.4%	43,339	14.5%	36,317 (83.8%)	7,022 (16.2%)	1,684,760 (40%)	3,887	585,617	1,351
2007	301,290	37,942	12.6%	44,263	14.7%	36,966 (83.5%)	7,297 (16.5%)	1,607,206 (46%)	3,631	579,233	1,309
2008	304,056	38,870	12.8%	45,412	14.9%	37,896 (83.4%)	7,516 (16.6%)	1,746,312 (47%)	3,845	621,323	1,368
2009	307,006	39,570	12.9%	45,801	14.9%	38,177 (83.4%)	7,624 (16.6%)	1,882,754 (46%)	4,111	682,903	1,491
2010	308,746	40,268	13.0%	46,914	15.2%	38,991 (83.1%)	7,923 (16.9%)	1,699,677 (49%)	3,623	645,197	1,375
2011	311,583	41,370	13.3%	48,300	15.5%	40,000 (82.8%)	8,300 (17.2%)	1,811,573 (51%)	3,751	682,472	1,413
2012	313,874	43,144	13.8%	50,300	16.0%	41,900 (83.3%)	8,500 (16.9%)	1,892,296 (51%)	3,762	734,514	1,460
2013	316,129	44,704	14.1%	51,900	16.4%	43,100 (83.0%)	8,800 (17.0%)	1,931,123 (51%)	3,721	753,922	1,453
2014	318,892	46,179	14.5%	53,500	16.8%	44,600 (83.4%)	8,900 (16.5%)	2,091,134 (50%)	3,909	825,287	1,543
Y2015	320,897	47,734	14.88%	54,900	17.1%	46,000 (83.8%)	9,000 (16.4%)	2,271,431 (51%)	4,137	897,742	1,635
Y2016	323,127	49,244	15.24%	56,500	17.5%	47,500 (84.1%)	9,000 (15.9%)	2,444,079 (52%)	4,326	967,868	1,713
Y2017	326,625	51,055	15.63%	58,000	17.8%	49,200 (84.8%)	8,900 (15.2%)	2,537,254 (53%)	4,375	1,011,287	1,744
Y2018	327,167	52,347	16.00%	59,600	18.2%	50,800 (85.2%)	8,800)14.8%)	2,638,563 (53%)	4,427	1,055,571	1,771
2000-2018	15.9%	49.2%	29.0%	50.4%	30.1%	48.3%	63.9%	603.2%	367.6%	632.2%	386.9%
GM	0.8%	2.3%	1.4%	2.3%	1.5%	2.2%	2.8%	11.5%	9.0%	11.7%	9.2%
2000-2009	8.8%	12.8%	4.0%	15.6%	6.6%	11.4%	42.0%	401.7%	334.2%	373.7%	309.9%
GM	0.9%	1.3%	0.4%	1.6%	0.7%	1.2%	4.0%	19.6%	17.7%	18.9%	17.0%
2009-2018	6.6%	32.3%	24.0%	30.1%	22.1%	33.1%	15.4%	40.1%	7.7%	54.6%	18.8%
GM	0.7%	3.2%	2.4%	3.0%	2.2%	3.2%	1.6%	3.8%	0.8%	5.0%	1.9%

Facet joint blocks: 64470 or 64490, 64472 64491 or 64492; L/S facet joint blocks 64475 or 64493, 64476 or 64494 or 64495; C/T facet neurolysis: 64626 or 64633, 64627 or 64634; L/S facet neurolysis: 64622 or 64635, 64623 or 64636. GM - Geometric average annual change ( ) facility percentage

interventions increased at an annual rate of 1.9% with overall increase of 18.8% from 2009 to 2018. In addition, overall rate of facet joint interventions from 2009 to 2018 increased 7.7% with an annual increase of 0.8%. Overall services also increased at an annual rate of 3.8% with an overall increase of 40.1% from 2009 to 2018.

There were substantial differences in utilization patterns before 2009 and after 2009. The overall rate increased at an annual rate of 9% with overall rate of 367.6% from 2000 to 2018. Most of these increases were attributed to the period from 2000 to 2009 with an overall increase of 334.2% and an annual increase of 17.7%. However, from 2009 to 2018, annual increases were of 1.9% per 100,000 Medicare population with 18.8% overall increase.

Utilization Characteristics

Table 3 and Fig. 1 show the usage characteristics of facet joint interventions in the FFS Medicare population from 2000 to 2018. Table 3 shows a minor decline of facet joint interventions sessions in lumbosacral spine at an annual rate of 0.2% from 2009 to 2018 compared with an annual increase of 15.2% from 2000 to 2009. In contrast, facet joint neurolysis sessions increased at an annual rate of 7.6% from 2009 to 2018 compared with 23% from 2000 to 2009.

The utilization pattern also revealed a pattern of increasing radiofrequency neurotomy procedures with declining utilization of facet joint nerve block sessions with 256/38 in 2000 to 896/467 in 2018 as shown in Table 4.

The utilization patterns changed from a rate of 913 facet joint nerve block sessions with 246 lumbar facet joint neurolytic sessions to 896 facet joint nerve block sessions compared with 467 facet joint neurolytic sessions. Overall, there was a significant decline of nerve blocks with an increase of lumbar facet joint neurolytic procedures. There was also significant differences in evolving utilization ratios in the year 2000; cervical/thoracic facet joint nerve blocks were performed at a rate of 62 compared with 7 of neurolytic procedures, increasing to 277 of facet joint nerve blocks compared with 56 changing to 290 of cervical/thoracic facet joint nerve block sessions to 118 cervical facet joint neurolytic sessions.

Cervicothoracic facet joint injection sessions increased at an annual rate of 0.6% from 2009 to 2018 compared with 18% from 2000 to 2009. Cervicothoracic facet joint neurolytic procedures increased substantially similar to lumbosacral facet joint procedures at an annual rate of 9.2% from 2009 to 2018 compared with 26% from 2000 to 2009. The ratio of cervicothoracic facet joint injections compared with neurolytic procedures decreased significantly from 8.85% in 2000 to 2.8% in 2018.

Figure 2 shows the proportional frequency of utilization of facet joint interventions in cervicothoracic

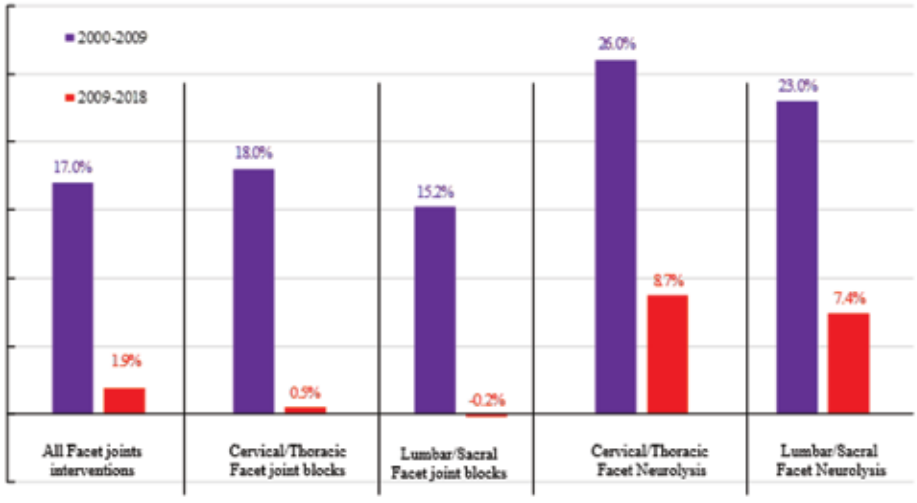

Fig. 1. *Comparative utilization patterns based on an annual rate from 2000-2009 and 2009-2018.*

Table 3. *Frequency of utilizations of facet joint interventions in the FFS Medicare population from 2000-2018.*

	L/S Facet Joint Blocks				L/S Facet Neurolysis				C/T Facet Joint Blocks				C/T Facet Neurolysis			
	Only Primary Sessions or Visits (CPT 64475 or 64493)		All Services (CPT 64475, 64493, 64476, 64494, 64495)		Only Primary Sessions or Visits (CPT 64622 or 64635		All Services (CPT 64622, 64635/ 64623, 64636		Only Primary Sessions or Visits (CPT 64470 or 64490)		All Services (CPT 64470/ 64472/ 64490/ 64491/ 64492)		Only Primary Sessions or Visits (CPT 64626/ 64633)		All Services (CPT 64626/ 64633, 64627, 64634)	
Year	Services	Rate	Services	Rate	Services	Rate	Services	Rate	Services	Rate	Services	Rate	Services	Rate	Services	Rate
F2000	101,539	256	254,791	643	15,117	38	53,323	135	24,751	62	58,324	147	2,750	7	8,804	22
F2001	121,234	303	297,088	742	18,792	47	66,424	166	34,500	86	82,184	205	3,815	10	12,149	30
F2002	155,620	384	395,863	977	25,744	64	89,266	220	41,935	104	103,916	257	5,190	13	17,392	43
F2003	189,263	460	489,065	1,189	35,315	86	118,481	288	49,958	121	125,447	305	6,877	17	22,178	54
F2004	286,394	686	754,217	1,807	57,053	137	189,404	454	77,620	186	203,765	488	10,691	26	34,152	82
F2005	316,158	744	835,847	1,967	63,228	149	209,916	494	86,541	204	228,540	538	12,015	28	38,313	90
F2006	370,809	856	1,007,482	2,325	79,289	183	305,588	705	121,312	280	325,490	751	14,207	33	46,200	107
F2007	365,372	825	964,940	2,180	88,069	199	297,485	672	108,103	244	287,382	649	17,689	40	57,399	130
F2008	385,491	849	1,020,266	2,247	100,606	222	340,874	751	114,497	252	316,354	697	20,729	46	68,818	152
F2009	418,036	913	1,081,726	2,362	112,627	246	376,013	821	126,730	277	341,532	746	25,510	56	83,483	182
F2010	386,897	825	944,469	2,013	116,959	249	378,761	807	114,753	245	290,640	620	26,588	57	85,807	183
F2011	402,507	833	990,449	2,051	125,630	260	406,378	841	124,431	258	317,220	657	29,904	62	97,526	202
F2012	426,386	848	1,049,496	2,086	141,130	281	406,332	808	131,377	261	334,751	666	35,621	71	101,717	202
F2013	423,970	817	1,043,861	2,011	155,353	299	434,386	837	135,544	261	343,919	663	39,055	75	108,957	210
F2014	458,539	857	1,125,757	2,104	178,121	333	480,723	899	144,940	271	364,436	681	43,687	82	120,218	225
F2015	490,685	894	1,205,502	2,196	202,460	369	542,154	988	154,275	281	387,042	705	50,322	92	136,733	249
F2016	513,752	909	1,256,525	2,224	232,683	412	617,765	1,093	163,308	289	412,873	731	58,125	103	156,916	278
F2017	523,649	903	1,273,415	2,196	256,617	442	672,472	1,159	166,955	288	420,046	724	64,066	110	171,321	295
F2018	534,088	896	1,297,863	2,178	278,151	467	719,928	1,208	172,954	290	434,054	728	70,378	118	186,718	313
2000-2018	426.0%	249.8%	409.4%	238.7%	1740.0%	1123.5%	1250.1%	797.8%	598.8%	364.7%	644.2%	394.9%	2459.2%	1601.8%	2020.8%	1310.3%
GM	9.7%	7.2%	9.5%	7.0%	17.6%	14.9%	15.6%	13.0%	11.4%	8.9%	11.8%	9.3%	19.8%	17.1%	18.5%	15.9%
2000-2009	311.7%	256.2%	324.6%	267.4%	645.0%	544.7%	605.2%	510.2%	412.0%	343.1%	485.6%	406.7%	827.6%	702.7%	848.2%	720.5%
GM	17.0%	15.2%	17.4%	15.6%	25.0%	23.0%	24.2%	22.3%	19.9%	18.0%	21.7%	19.8%	28.1%	26.0%	28.4%	26.3%
2009-2018	27.8%	-1.8%	20.0%	-7.8%	147.0%	89.8%	91.5%	47.1%	36.5%	4.9%	27.1%	-2.3%	175.9%	112.0%	123.7%	71.9%
GM	2.8%	-0.2%	2.0%	-0.9%	10.6%	7.4%	7.5%	4.4%	3.5%	0.5%	2.7%	-0.3%	11.9%	8.7%	9.4%	6.2%

L/S = Lumbosacral; C/T = Cervicothoracic; GM = Geometric Average Annual Change

Table 4. *Reversal of utilization patterns of nerve blocks compared to neurolytic procedures in the FFS Medicare population from 2000-2018.*

	Lumbosacral Facet Joint Interventions				Cervical/Thoracic Facet Joint interventions			
	Rate of sessions		Rate of services		Rate of sessions		Rate of services	
Year	Nerve blocks	Neurolytic	Nerve blocks	Neurolytic	Nerve blocks	Neurolytic	Nerve blocks	Neurolytic
F2000	256	38	643	135	62	7	147	22
F2009	913	246	2,362	821	277	56	746	182
F2018	896	467	2,178	1,208	290	118	728	313

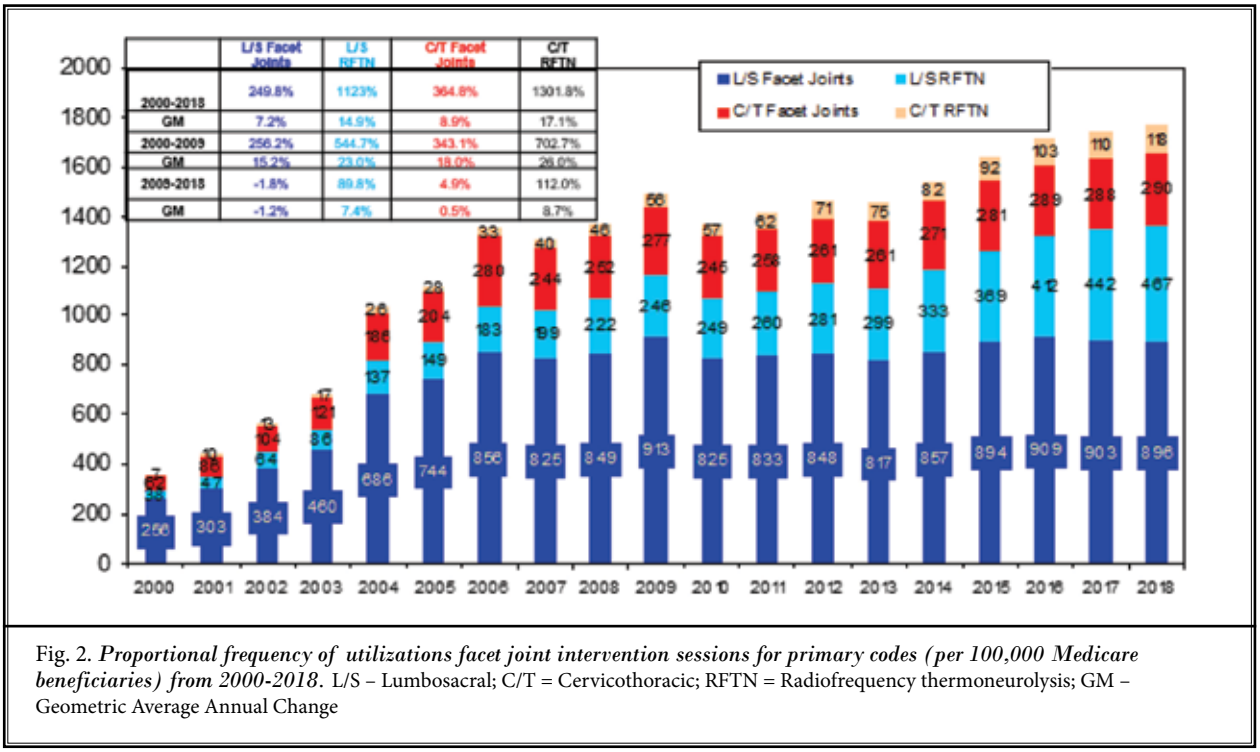

Fig. 2. *Proportional frequency of utilizations facet joint intervention sessions for primary codes (per 100,000 Medicare beneficiaries) from 2000-2018.* L/S – Lumbosacral; C/T = Cervicothoracic; RFTN = Radiofrequency thermoneurolysis; GM – Geometric Average Annual Change

and lumbosacral spine from 2000 to 2018. Appendix Fig. 1 shows comparative growth rate and services.

Statewide Utilization

As shown in Table 5, there was an overall increase of utilization ranging from 0.1% to 4.1% in all jurisdictions except First Coast Services covering Florida with a small decline of 0.2%. Appendix Table 1 shows utilization of facet joint interventions from 2009 to 2018 in an alphabetical order. Similarly, Appendix Table 2 shows utilization patterns based on percentage of change from high to low with significant changes noted in Oklahoma, Colorado, Nebraska, Utah, Alaska, Iowa, Delaware, New Jersey, New Mexico, Virginia, Louisiana, Nevada, and Arizona with increases ranging from 5% to 9.5%. Several states including Michigan, Rhode Island, Texas, Tennessee, South Dakota, California, Wyoming, Florida, and Washington showed declines of 0.2% in Florida to 3.9% in Michigan. However, these data also may indicate the fact that there was extensive use in earlier years compared with other states and which have declined to a normal rate. Thus, in Oklahoma in 2009 the rate per 100,000 population was 1,235 with an annual increase of 9.5%, Colorado 913 with an increase of 8.8%, Nebraska 727 with an increase of 8.6%, Utah 1,629 with an increase of 7.4% compared with Michigan in 2009 utilization of 2,644 with a decline of 3.9% per year, and Rhode Island 1,224 with a decline of 2.6% per year. However, Texas had high utilization in 2009 with 2,431 per 100,000 Medicare population, yet

Table 5. *Utilizations of facet joint interventions (rates per 100,000) in the FFS Medicare population from 2009-2018 based on MAC jurisdictions of 2016.*

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	GM
Cahaba												
Alabama	1,410	1,653	1,670	1,745	1,572	1,648	1,694	1,803	1,570	1,448	3%	0.3%
Georgia	2,340	1,964	2,088	2,163	2,036	2,197	2,364	2,446	2,449	2,496	7%	0.7%
Tennessee	1,935	2,010	1,962	2,124	1,640	1,517	1,601	1,752	1,840	1,778	-8%	-0.9%
Cahaba Total	1,951	1,896	1,934	2,038	1,780	1,825	1,934	2,049	2,023	1,992	2%	0.2%
PCPY		-2.8%	2.0%	5.4%	-12.7%	2.5%	6.0%	5.9%	-1.3%	-1.5%		
CGS												
Kentucky	1,793	1,642	1,746	2,024	2,136	2,015	2,223	2,315	2,525	2,631	47%	4.4%
Ohio	1,280	1,292	1,320	1,484	1,504	1,520	1,528	1,745	1,738	1,674	31%	3.0%
CGS Total	1,426	1,392	1,442	1,639	1,686	1,663	1,728	1,908	1,962	1,947	36%	3.5%
PCPY		-2.4%	3.6%	13.7%	2.9%	-1.4%	3.9%	10.4%	7.2%	-0.8%		
First Coast												
Florida	2,544	2,253	2,267	2,371	2,231	2,351	2,463	2,591	2,458	2,504	-2%	-0.2%
PCPY		-11.4%	0.6%	4.6%	-5.9%	5.4%	4.8%	5.2%	-5.1%	1.9%		
NGS												
Connecticut	872	834	883	960	1,001	1,134	1,159	1,216	1,275	1,247	43%	4.1%
Illinois	1,200	953	998	1,132	1,112	1,142	1,210	1,286	1,316	1,337	11%	1.2%
Maine	819	831	1,036	1,140	1,104	1,309	1,384	1,287	1,325	1,227	50%	4.6%
Massachusetts	1,264	1,377	1,603	1,738	1,715	1,722	1,752	1,768	1,781	1,837	45%	4.2%
Minnesota	739	741	783	878	862	876	893	932	885	874	18%	1.9%
New Hampshire	1,385	1,677	1,834	2,020	1,956	1,927	1,758	1,665	1,705	1,708	23%	2.4%
New York	803	743	763	789	888	1,011	1,081	1,130	1,141	1,166	45%	4.2%
Rhode Island	1,224	1,295	1,291	1,195	1,082	1,084	1,161	1,077	852	969	-21%	-2.6%
Vermont	1,094	1,110	1,124	1,119	1,275	1,385	1,552	1,525	1,487	1,331	22%	2.2%
Wisconsin	1,176	1,208	1,286	1,434	1,430	1,474	1,482	1,484	1,457	1,444	23%	2.3%
NGS Total	1,003	956	1,024	1,111	1,136	1,206	1,252	1,286	1,291	1,304	30%	3.0%
PCPY		-4.7%	7.1%	8.4%	2.3%	6.1%	3.8%	2.7%	0.4%	1.0%		
Noridian												
Alaska	872	958	741	545	752	1,057	1,565	1,429	1,378	1,603	84%	7.0%
Arizona	1,859	1,982	2,004	2,090	2,184	2,378	2,436	2,589	2,667	2,912	57%	5.1%
California	1,218	1,054	1,074	1,090	1,074	1,066	1,099	1,099	1,093	1,126	-8%	-0.9%
Idaho	902	936	1,050	952	971	1,177	1,303	1,157	1,198	1,401	55%	5.0%
Montana	1,150	948	1,085	1,045	1,046	1,055	1,145	1,125	1,087	1,258	9%	1.0%
Nevada	1,635	1,904	1,964	2,249	2,229	2,279	2,491	2,470	2,397	2,637	61%	5.5%
North Dakota	813	693	509	490	678	739	730	768	998	1,040	28%	2.8%
Oregon	770	780	745	727	822	880	987	1,074	1,079	1,152	50%	4.6%
South Dakota	1,838	1,705	1,481	1,069	1,113	1,242	1,316	1,435	1,480	1,683	-8%	-1.0%
Utah	1,629	1,741	1,758	2,072	2,234	2,551	2,891	3,032	2,893	3,101	90%	7.4%

Table 5 (cont.). *Utilizations of facet joint interventions (rates per 100,000) in the FFS Medicare population from 2009-2018 based on MAC jurisdictions of 2016.*

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	GM
Noridian (cont.)												
Washington	1,030	930	828	687	704	754	800	863	923	1,028	0%	0.0%
Wyoming	1,485	1,595	1,238	1,142	1,400	1,591	1,525	1,503	1,456	1,374	-7%	-0.9%
Noridian Total	1,259	1,182	1,180	1,190	1,214	1,267	1,336	1,365	1,376	1,472	17%	1.8%
PCPY		-6.1%	-0.2%	0.9%	2.1%	4.4%	5.4%	2.1%	0.8%	6.9%		
Palmetto GBA												
North Carolina	1,336	1,288	1,278	1,355	1,307	1,285	1,403	1,497	1,621	1,657	24%	2.4%
South Carolina	1,682	1,575	1,690	1,922	2,132	2,319	2,470	2,401	2,548	2,550	52%	4.7%
Virginia	952	850	888	964	1,183	1,322	1,431	1,503	1,560	1,583	66%	5.8%
West Virginia	1,161	1,224	1,283	1,429	1,573	1,659	1,691	1,915	1,878	1,614	39%	3.7%
Palmetto Total	1,273	1,208	1,246	1,361	1,469	1,550	1,665	1,728	1,823	1,821	43%	4.1%
PCPY		-5.1%	3.1%	9.3%	7.9%	5.5%	7.4%	3.8%	5.5%	-0.1%		
Novitas												
Arkansas	2,495	2,306	1,927	1,956	2,167	2,436	2,816	3,218	3,407	3,712	49%	4.5%
Colorado	913	906	959	1,162	1,202	1,411	1,504	1,704	1,839	1,943	113%	8.8%
DC	6,489	6,247	7,029	6,789	9,182	10,554	12,118	12,306	12,072	12,580	94%	7.6%
Delaware	1,375	1,194	1,208	1,193	1,533	1,878	2,102	2,367	2,105	2,356	71%	6.2%
Louisiana	1,343	1,400	1,491	1,640	1,855	2,001	2,061	2,136	2,202	2,221	65%	5.8%
Maryland	1,439	1,303	1,475	1,540	1,744	1,949	2,065	1,898	1,777	1,847	28%	2.8%
Mississippi	1,875	1,646	1,795	2,024	2,130	1,991	2,107	2,285	2,296	2,346	25%	2.5%
New Jersey	967	1,013	1,100	1,143	1,280	1,469	1,621	1,679	1,611	1,635	69%	6.0%
New Mexico	1,064	1,095	1,201	1,418	1,264	1,356	1,506	1,518	1,636	1,776	67%	5.9%
Oklahoma	1,235	1,191	1,270	1,379	1,483	1,845	2,303	2,374	2,722	2,796	126%	9.5%
Pennsylvania	978	931	937	950	1,033	1,112	1,183	1,308	1,341	1,356	39%	3.7%
Texas	2,431	1,914	1,941	1,912	1,921	1,980	2,103	2,265	2,213	2,216	-9%	-1.0%
Novitas total	1,603	1,428	1,472	1,521	1,623	1,757	1,909	2,038	2,048	2,099	31%	3.0%
PCPY		-10.9%	3.1%	3.3%	6.7%	8.3%	8.6%	6.7%	0.5%	2.5%		
WPS												
Indiana	1,572	1,686	1,792	1,892	1,704	1,920	2,142	2,212	2,032	2,043	30%	3.0%
Iowa	605	694	800	813	826	856	1,016	1,151	1,064	1,102	82%	6.9%
Kansas	1,056	1,030	1,077	1,021	1,149	1,226	1,345	1,385	1,468	1,611	53%	4.8%
Michigan	2,644	2,057	2,239	2,463	2,457	2,810	2,823	2,528	2,095	1,852	-30%	-3.9%
Missouri	1,571	1,532	1,577	1,672	1,618	1,792	1,725	1,659	1,711	1,760	12%	1.3%
Nebraska	727	689	708	787	754	904	1,087	1,297	1,348	1,524	110%	8.6%
WPS Total	1,735	1,560	1,671	1,789	1,754	1,974	2,048	1,973	1,800	1,756	1%	0.1%
PCPY		-10.1%	7.1%	7.1%	-2.0%	12.5%	3.7%	-3.6%	-8.8%	-2.5%		
US Total	1,491	1,375	1,413	1,460	1,453	1,543	1,635	1,713	1,744	1,771	18.80%	1.90%

PCPY = Percent of change from previous year; GM = Geometric Average Annual Change; WPS – Wisconsin Physician Service Insurance Corporation; NGS = National Government Services; CGS = CGS Administrators, LLC

showed only a 1% decline. Florida also had utilization of 2,544 per 100,000 population declining by 0.02% annually.

Further, statewide utilization of lumbar facet joint nerve blocks with services is shown in Appendix Table 3. Similarly, Appendix Table 4 shows utilization of radiofrequency neurotomy procedures in lumbar spine with primary code data.

There were significant variations noted in utilization patterns of lumbar facet joint nerve blocks compared with lumbar radiofrequency neurotomy procedures from 2009 to 2018. As shown in Appendix Table 3, overall there was an annual decline of 0.2% utilization of lumbar facet joint nerve blocks. These declines were observed across most jurisdictions with the majority of jurisdictions except for CGS Administrators with a 0.9% increase, National Government Services (NGS) with a 0.8% increase, Palmetto with a 2.5% increase, and Novitas with a 0.7% increase.

As shown in Appendix Table 4, radiofrequency neurotomy procedures in the lumbar spine increased substantially compared with an annual increase of 7.4% with a total increase from 2009 to 2018 of 89.8%, this contrasts with an annual decrease of 0.2% and overall decrease of 1.8% for facet joint nerve blocks. In addition, increases were observed in all jurisdictions.

The differences in utilization patterns of lumbar facet joint nerve blocks compared with facet joint radiofrequency neurotomy may be attributed to multiple reasons including reimbursement patterns which were low until 2018, LCDs and some organizations encouraging radiofrequency neurotomy procedures, and finally the differences in positive diagnosis of facet joint pain at lower thresholds of 50% relief rather than 80% relief (68,71-74).

Place of Service

Appendix Table 5 show utilization of facet joint interventions based on place of service. The results showed an increase of services and rate of 7.6% and 4.5% in ambulatory surgery centers, 6.3% and 3.3% in hospital outpatient departments, and 3.3% and 2.9% for in office settings. Since 2009 to 2018, the proportion of patients performed in ambulatory surgery centers increased from 24% to 27.9%, those performed in a hospital setting increased from 22% to 24.7%, whereas, procedures performed in an office setting decreased from 53.9% to 45.2%.

These changes are similar or different compared with the procedures performed for overall interventional techniques and epidural procedures (30,74).

Discussion

Analysis of utilization patterns of facet joint interventions in managing spinal pain from 2009 to 2018, in Medicare FFS population, overall results showed an increasing rate of facet joint interventions of 18.8% utilizing patient visits or sessions per region of 18.8% with an annual increase of 1.9% compared with prior assessments of the period from 2000 to 2009, showing an overall increase of 309.9% and an annual increase of 17%. The majority of the explosive growth patterns were attributed prior to 2009 and a decline in growth and real decline of some procedures with increase of others has been observed from 2009 onwards. Review of procedure specific data, lumbar facet joint injection sessions declined at an annual rate of 0.2% after 2009 versus an annual increase of 15.2%. Cervical/thoracic facet joint block sessions also increased at an extremely slow pace of 0.5% after 2009 annually compared with prior increases of 18% before 2009. However, overall facet joint interventions increased 1.9% after 2009, whereas the increases were 17% before 2009. In contrast, the utilization of facet joint interventions in cervical, thoracic, and lumbosacral spine have increased at a much faster pace with an annual increase of 7.4% after 2009 compared with 23% prior to 2009. Similarly, cervical/thoracic facet neurolysis procedures also increased at 8.7% after 2009 and 26.10% before 2009. Thus, increases of facet joint neurolysis were considered to be much smaller compared with the previous years, they appear to be high compared with facet joint blocks, specifically of the lumbosacral spine, which consistently experienced an annual decline. Further, changes in the growth patterns also were less significant compared with overall Medicare beneficiary growth and US population growth of those over 65 years, from 2009 to 2018, annual growth of Medicare beneficiaries was 3%. Further, comparison of service sessions rather than rate also showed an annual increase of 2.8%, less than the population growth of Medicare beneficiaries. The statewide utilization of facet joint interventions showed some variations, however, with no significant differences noted among the state utilization data based on MAC jurisdictions.

The results of this assessment are comparable to previous evaluations (30,31,75) showing the trends of overall reversal of growth and decline of interventional technique except for a few interventions. These declines after 2009 may be attributed to multiple health care regulations initiated by ACA (5-11), enactment of multiple LCDs (68,71-73), advocacy in the favor of ra-

diofrequency neurotomy procedures (71), and reduced reimbursement rates (7,74,76). Finally, arguments in reference to lack of indications and medical necessity may also have significant influence on reduced services, which extends beyond the Medicare FFS population to managed care organizations includes those of Medicaid and Medicare along with commercial payers.

Continued declines in utilization patterns is seen as a positive sign, yet, while there may be reductions in access, there may also be procedures which do not meet proper criteria of medical necessity and indications (40-48,77-81). However, the disagreements and criticisms are not limited to only the positive evidence, but also negative evidence. As an example, a recent manuscript by Juch et al (79) was followed by significant criticism of inappropriate performance of the trial, not only with the technical aspects, but with selection criteria and the reporting criteria (82-85). The presented evidence has been derived from multiple relevant randomized controlled trials and systematic reviews. Some even claim that there is lack of evidence and lack of validity of the diagnosis of facet joint pain, which is considered as non-specific low back pain (79,80). Some have considered lack of necessity of repeat procedures, based on outcomes from surgical interventions (48). However, it is beyond any question that it is difficult to perform placebo controlled randomized controlled trials with interventional techniques in the United States in difficult to perform interventional techniques (80,86). Consequently the focus has been diverted to pragmatic trials performed in practical settings, now described as real-world evidence (87,88), yet there have been significant descriptions of conflicts or confluence of interest, inability to identify true placebo, inappropriate conversions of local anesthetic injections into placebos, lack of clear definition of placebo effect in comparative or active control trials (42-44,62,66,87-92). In fact, it has been clearly shown that local anesthetic lidocaine itself is equivalent to in response with epidural injections when administered alone or with steroids (49,50,62,93,94). In addition, systematic reviews have revealed significant evidence of placebo with epidurally administered sodium chloride being equal to epidurally administered methylprednisolone (91). There is also limited evidence showing effectiveness of bupivacaine similar to bupivacaine with steroids.

As with all epidemiological or analytic studies, this analysis also suffers with some limitations including lack of participation of Medicare Advantage Plans which presently constitutes approximately 30% of the Medicare population. However, multiple advantages include utilization of 100% FFS Medicare data without any extrapolation. The analysis also includes the FFS Medicare population in all the patients on Medicare either based on age or owing to disability. Further, these data can be extrapolated to other insurers in general showing the coverage policies.

Conclusions

This analysis of updated utilization patterns of facet joint interventions in FFS Medicare population spanning from 2000 to 2018 showed growth of overall facet joint interventions at an annual rate of 1.9% per 100,000 Medicare population, with annual decline of 0.2% of lumbar facet joint injection sessions, whereas, facet joint radiofrequency procedure sessions increased 7.4%. Similar results were observed with cervical facet joint nerve blocks and radiofrequency neurotomy, with an increase of cervical facet neurolysis of 8.7% annually and 112% overall from 2009 to 2018. The rate of cervical/thoracic facet joint nerve blocks increased 0.5% annually and 4.9% from 2009 to 2018. This assessment significantly showed reversal of utilization patterns of nerve blocks compared with radiofrequency neurotomy changing from a rate of 256 lumbar facet joint nerve blocks in 2000 with an increase of 896 in 2018, compared with facet neurolysis that increased from 38 to 467. Cervical facet joint nerve blocks and radiofrequency neurotomy also showed similar results with 62 facet joint nerve blocks per 100,000 Medicare population and 7 radiofrequency neurotomy procedures in 2000, changing to 290 facet joint nerve block procedures compared with 118 radiofrequency neurotomy procedures.

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The study was designed by LM, VP, ADK and JAH.

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Appendix Fig. 1. *Growth of facet joint interventions*

Appendix Table 1. *Utilizations of facet joint interventions (rates per 100,000) in the Medicare population from 2009 to 2018 (in alphabetical order).* *First page*, *second page*

Appendix Table 2. *Utilizations of facet joint intervention sessions (rates per 100,000) in the Medicare population from 2009 to 2018 (by percentage of change).* *First page*, *second page*

Appendix Table 3. *Utilizations of lumbar facet injection sessions (rates per 100,000) in the Medicare population from 2009 to 2018 (2016 Medicare Carrier).* *First page*, *second page*

Appendix Table 4. *Utilizations of Lumbar Facet Neurolysis injection sessions (rates per 100,000) in the Medicare population from 2009 to 2018 (2016 Medicare Carrier).* *First page*, *second page*

Appendix Table 5. *Utilizations of rate and services of facet joint intervention sessions by place of service.*

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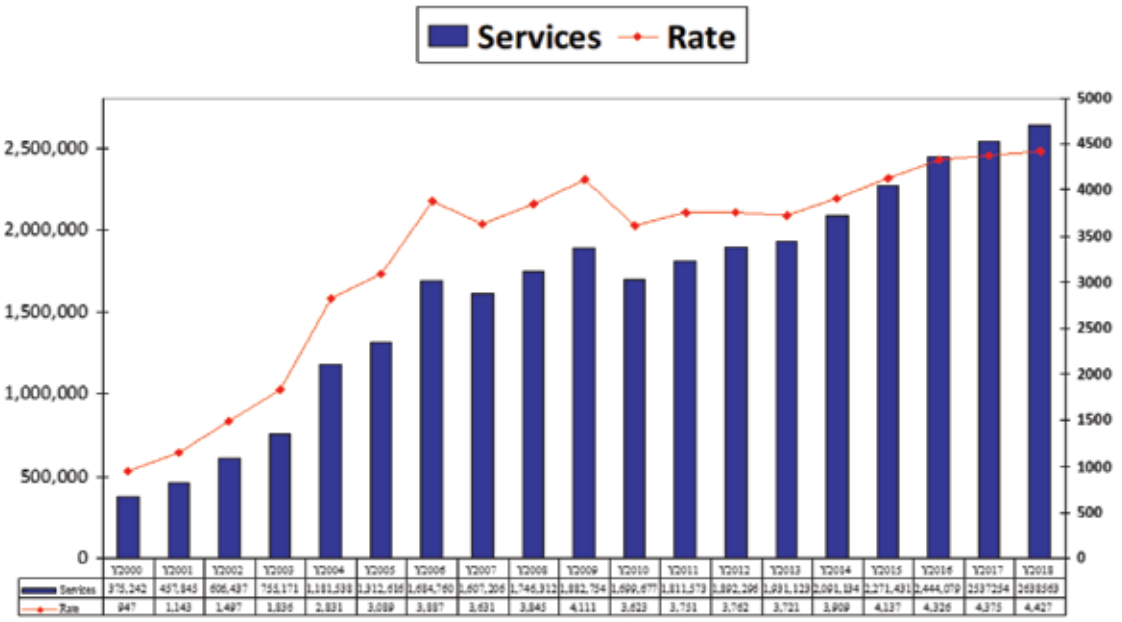

Appendix Fig. 1. Growth of facet joint interventions.

Appendix Table 1. *Utilizations of facet joint interventions (rates per 100,000) in the Medicare population from 2009-2018 (in alphabetical order).*

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	GM
Alabama	1,410	1,653	1,670	1,745	1,572	1,648	1,694	1,803	1,570	1,448	3%	0.3%
Alaska	872	958	741	545	752	1,057	1,565	1,429	1,378	1,603	84%	7.0%
Arizona	1,859	1,982	2,004	2,090	2,184	2,378	2,436	2,589	2,667	2,912	57%	5.1%
Arkansas	2,495	2,306	1,927	1,956	2,167	2,436	2,816	3,218	3,407	3,712	49%	4.5%
California	1,218	1,054	1,074	1,090	1,074	1,066	1,099	1,099	1,093	1,126	-8%	-0.9%
Colorado	913	906	959	1,162	1,202	1,411	1,504	1,704	1,839	1,943	113%	8.8%
Connecticut	872	834	883	960	1,001	1,134	1,159	1,216	1,275	1,247	43%	4.1%
DC	6,489	6,247	7,029	6,789	9,182	10,554	12,118	12,306	12,072	12,580	94%	7.6%
Delaware	1,375	1,194	1,208	1,193	1,533	1,878	2,102	2,367	2,105	2,356	71%	6.2%
Florida	2,544	2,253	2,267	2,371	2,231	2,351	2,463	2,591	2,458	2,504	-2%	-0.2%
Georgia	2,340	1,964	2,088	2,163	2,036	2,197	2,364	2,446	2,449	2,496	7%	0.7%
Idaho	902	936	1,050	952	971	1,177	1,303	1,157	1,198	1,401	55%	5.0%
Illinois	1,200	953	998	1,132	1,112	1,142	1,210	1,286	1,316	1,337	11%	1.2%
Indiana	1,572	1,686	1,792	1,892	1,704	1,920	2,142	2,212	2,032	2,043	30%	3.0%
Iowa	605	694	800	813	826	856	1,016	1,151	1,064	1,102	82%	6.9%
Kansas	1,056	1,030	1,077	1,021	1,149	1,226	1,345	1,385	1,468	1,611	53%	4.8%
Kentucky	1,793	1,642	1,746	2,024	2,136	2,015	2,223	2,315	2,525	2,631	47%	4.4%
Louisiana	1,343	1,400	1,491	1,640	1,855	2,001	2,061	2,136	2,202	2,221	65%	5.8%
Maine	819	831	1,036	1,140	1,104	1,309	1,384	1,287	1,325	1,227	50%	4.6%
Maryland	1,439	1,303	1,475	1,540	1,744	1,949	2,065	1,898	1,777	1,847	28%	2.8%
Massachusetts	1,264	1,377	1,603	1,738	1,715	1,722	1,752	1,768	1,781	1,837	45%	4.2%
Michigan	2,644	2,057	2,239	2,463	2,457	2,810	2,823	2,528	2,095	1,852	-30%	-3.9%
Minnesota	739	741	783	878	862	876	893	932	885	874	18%	1.9%
Mississippi	1,875	1,646	1,795	2,024	2,130	1,991	2,107	2,285	2,296	2,346	25%	2.5%
Missouri	1,571	1,532	1,577	1,672	1,618	1,792	1,725	1,659	1,711	1,760	12%	1.3%
Montana	1,150	948	1,085	1,045	1,046	1,055	1,145	1,125	1,087	1,258	9%	1.0%
Nebraska	727	689	708	787	754	904	1,087	1,297	1,348	1,524	110%	8.6%
Nevada	1,635	1,904	1,964	2,249	2,229	2,279	2,491	2,470	2,397	2,637	61%	5.5%
New Hampshire	1,385	1,677	1,834	2,020	1,956	1,927	1,758	1,665	1,705	1,708	23%	2.4%
New Jersey	967	1,013	1,100	1,143	1,280	1,469	1,621	1,679	1,611	1,635	69%	6.0%
New Mexico	1,064	1,095	1,201	1,418	1,264	1,356	1,506	1,518	1,636	1,776	67%	5.9%
New York	803	743	763	789	888	1,011	1,081	1,130	1,141	1,166	45%	4.2%
North Carolina	1,336	1,288	1,278	1,355	1,307	1,285	1,403	1,497	1,621	1,657	24%	2.4%
North Dakota	813	693	509	490	678	739	730	768	998	1,040	28%	2.8%
Ohio	1,280	1,292	1,320	1,484	1,504	1,520	1,528	1,745	1,738	1,674	31%	3.0%
Oklahoma	1,235	1,191	1,270	1,379	1,483	1,845	2,303	2,374	2,722	2,796	126%	9.5%
Oregon	770	780	745	727	822	880	987	1,074	1,079	1,152	50%	4.6%
Pennsylvania	978	931	937	950	1,033	1,112	1,183	1,308	1,341	1,356	39%	3.7%

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	GM
Rhode Island	1,224	1,295	1,291	1,195	1,082	1,084	1,161	1,077	852	969	-21%	-2.6%
South Carolina	1,682	1,575	1,690	1,922	2,132	2,319	2,470	2,401	2,548	2,550	52%	4.7%
South Dakota	1,838	1,705	1,481	1,069	1,113	1,242	1,316	1,435	1,480	1,683	-8%	-1.0%
Tennessee	1,935	2,010	1,962	2,124	1,640	1,517	1,601	1,752	1,840	1,778	-8%	-0.9%
Texas	2,431	1,914	1,941	1,912	1,921	1,980	2,103	2,265	2,213	2,216	-9%	-1.0%
Utah	1,629	1,741	1,758	2,072	2,234	2,551	2,891	3,032	2,893	3,101	90%	7.4%
Vermont	1,094	1,110	1,124	1,119	1,275	1,385	1,552	1,525	1,487	1,331	22%	2.2%
Virginia	952	850	888	964	1,183	1,322	1,431	1,503	1,560	1,583	66%	5.8%
Washington	1,030	930	828	687	704	754	800	863	923	1,028	0%	0.0%
West Virginia	1,161	1,224	1,283	1,429	1,573	1,659	1,691	1,915	1,878	1,614	39%	3.7%
Wisconsin	1,176	1,208	1,286	1,434	1,430	1,474	1,482	1,484	1,457	1,444	23%	2.3%
Wyoming	1,485	1,595	1,238	1,142	1,400	1,591	1,525	1,503	1,456	1,374	-7%	-0.9%

PCPY: Percent of change from previous year; primary sessions or visits only

Appendix Table 2. *Utilizations of facet joint intervention sessions (rates per 100,000) in the Medicare population from 2009-2018 (By percentage of change).*

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	GM
Oklahoma	1,235	1,191	1,270	1,379	1,483	1,845	2,303	2,374	2,722	2,796	126%	9.5%
Colorado	913	906	959	1,162	1,202	1,411	1,504	1,704	1,839	1,943	113%	8.8%
Nebraska	727	689	708	787	754	904	1,087	1,297	1,348	1,524	110%	8.6%
DC	6,489	6,247	7,029	6,789	9,182	10,554	12,118	12,306	12,072	12,580	94%	7.6%
Utah	1,629	1,741	1,758	2,072	2,234	2,551	2,891	3,032	2,893	3,101	90%	7.4%
Alaska	872	958	741	545	752	1,057	1,565	1,429	1,378	1,603	84%	7.0%
Iowa	605	694	800	813	826	856	1,016	1,151	1,064	1,102	82%	6.9%
Delaware	1,375	1,194	1,208	1,193	1,533	1,878	2,102	2,367	2,105	2,356	71%	6.2%
New Jersey	967	1,013	1,100	1,143	1,280	1,469	1,621	1,679	1,611	1,635	69%	6.0%
New Mexico	1,064	1,095	1,201	1,418	1,264	1,356	1,506	1,518	1,636	1,776	67%	5.9%
Virginia	952	850	888	964	1,183	1,322	1,431	1,503	1,560	1,583	66%	5.8%
Louisiana	1,343	1,400	1,491	1,640	1,855	2,001	2,061	2,136	2,202	2,221	65%	5.8%
Nevada	1,635	1,904	1,964	2,249	2,229	2,279	2,491	2,470	2,397	2,637	61%	5.5%
Arizona	1,859	1,982	2,004	2,090	2,184	2,378	2,436	2,589	2,667	2,912	57%	5.1%
Idaho	902	936	1,050	952	971	1,177	1,303	1,157	1,198	1,401	55%	5.0%
Kansas	1,056	1,030	1,077	1,021	1,149	1,226	1,345	1,385	1,468	1,611	53%	4.8%
South Carolina	1,682	1,575	1,690	1,922	2,132	2,319	2,470	2,401	2,548	2,550	52%	4.7%
Maine	819	831	1,036	1,140	1,104	1,309	1,384	1,287	1,325	1,227	50%	4.6%
Oregon	770	780	745	727	822	880	987	1,074	1,079	1,152	50%	4.6%
Arkansas	2,495	2,306	1,927	1,956	2,167	2,436	2,816	3,218	3,407	3,712	49%	4.5%
Kentucky	1,793	1,642	1,746	2,024	2,136	2,015	2,223	2,315	2,525	2,631	47%	4.4%
Massachusetts	1,264	1,377	1,603	1,738	1,715	1,722	1,752	1,768	1,781	1,837	45%	4.2%
New York	803	743	763	789	888	1,011	1,081	1,130	1,141	1,166	45%	4.2%
Connecticut	872	834	883	960	1,001	1,134	1,159	1,216	1,275	1,247	43%	4.1%
Pennsylvania	978	931	937	950	1,033	1,112	1,183	1,308	1,341	1,356	39%	3.7%
West Virginia	1,161	1,224	1,283	1,429	1,573	1,659	1,691	1,915	1,878	1,614	39%	3.7%
Ohio	1,280	1,292	1,320	1,484	1,504	1,520	1,528	1,745	1,738	1,674	31%	3.0%
Indiana	1,572	1,686	1,792	1,892	1,704	1,920	2,142	2,212	2,032	2,043	30%	3.0%
Maryland	1,439	1,303	1,475	1,540	1,744	1,949	2,065	1,898	1,777	1,847	28%	2.8%
North Dakota	813	693	509	490	678	739	730	768	998	1,040	28%	2.8%
Mississippi	1,875	1,646	1,795	2,024	2,130	1,991	2,107	2,285	2,296	2,346	25%	2.5%
North Carolina	1,336	1,288	1,278	1,355	1,307	1,285	1,403	1,497	1,621	1,657	24%	2.4%
New Hampshire	1,385	1,677	1,834	2,020	1,956	1,927	1,758	1,665	1,705	1,708	23%	2.4%
Wisconsin	1,176	1,208	1,286	1,434	1,430	1,474	1,482	1,484	1,457	1,444	23%	2.3%
Vermont	1,094	1,110	1,124	1,119	1,275	1,385	1,552	1,525	1,487	1,331	22%	2.2%
Minnesota	739	741	783	878	862	876	893	932	885	874	18%	1.9%
Missouri	1,571	1,532	1,577	1,672	1,618	1,792	1,725	1,659	1,711	1,760	12%	1.3%
Illinois	1,200	953	998	1,132	1,112	1,142	1,210	1,286	1,316	1,337	11%	1.2%

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	GM
Montana	1,150	948	1,085	1,045	1,046	1,055	1,145	1,125	1,087	1,258	9%	1.0%
Georgia	2,340	1,964	2,088	2,163	2,036	2,197	2,364	2,446	2,449	2,496	7%	0.7%
Alabama	1,410	1,653	1,670	1,745	1,572	1,648	1,694	1,803	1,570	1,448	3%	0.3%
Washington	1,030	930	828	687	704	754	800	863	923	1,028	0%	0.0%
Florida	2,544	2,253	2,267	2,371	2,231	2,351	2,463	2,591	2,458	2,504	-2%	-0.2%
Wyoming	1,485	1,595	1,238	1,142	1,400	1,591	1,525	1,503	1,456	1,374	-7%	-0.9%
California	1,218	1,054	1,074	1,090	1,074	1,066	1,099	1,099	1,093	1,126	-8%	-0.9%
South Dakota	1,838	1,705	1,481	1,069	1,113	1,242	1,316	1,435	1,480	1,683	-8%	-1.0%
Tennessee	1,935	2,010	1,962	2,124	1,640	1,517	1,601	1,752	1,840	1,778	-8%	-0.9%
Texas	2,431	1,914	1,941	1,912	1,921	1,980	2,103	2,265	2,213	2,216	-9%	-1.0%
Rhode Island	1,224	1,295	1,291	1,195	1,082	1,084	1,161	1,077	852	969	-21%	-2.6%
Michigan	2,644	2,057	2,239	2,463	2,457	2,810	2,823	2,528	2,095	1,852	-30%	-3.9%

PCPY: Percent of change from previous year; primary sessions or visits only

Appendix Table 3. *Utilizations of lumbar facet injection sessions (rates per 100,000) in the Medicare population from 2009-2018 (2016 Medicare Carrier).*

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	Rate
Cahaba												
Alabama	993	1,146	1,131	1,163	1,029	1,077	1,079	1,114	938	849	-14.5%	-1.7%
Georgia	1,171	1,100	1,157	1,154	1,066	1,173	1,237	1,262	1,191	1,179	0.7%	0.1%
Tennessee	1,372	1,440	1,326	1,357	1,010	889	886	960	971	921	-32.9%	-4.3%
Cahaba Total	1,190	1,227	1,207	1,224	1,038	1,053	1,079	1,123	1,053	1,010	-15.2%	-1.8%
PCPY		3.1%	-1.6%	1.5%	-15.3%	1.5%	2.5%	4.1%	-6.2%	-4.1%		
CGS												
Kentucky	1,008	883	922	1,048	1,079	1,017	1,186	1,153	1,211	1,234	22.3%	2.3%
Ohio	842	807	837	892	859	873	857	952	911	855	1.6%	0.2%
CGS Total	889	829	861	937	922	914	952	1,010	997	963	8.3%	0.9%
PCPY		-6.8%	3.9%	8.7%	-1.5%	-0.9%	4.1%	6.1%	-1.3%	-3.4%		
First Coast												
Florida	1,559	1,385	1,380	1,406	1,274	1,310	1,331	1,358	1,264	1,254	-19.5%	-2.4%
PCPY		-11.2%	-0.3%	1.8%	-9.3%	2.8%	1.6%	2.0%	-6.9%	-0.8%		
NGS												
Connecticut	654	596	595	627	653	706	725	746	766	696	6.4%	0.7%
Illinois	789	573	587	650	614	619	642	677	680	665	-15.7%	-1.9%
Maine	515	515	649	726	685	759	833	747	764	722	40.1%	3.8%
Massachusetts	895	952	1,112	1,178	1,150	1,148	1,156	1,156	1,140	1,146	28.1%	2.8%
Minnesota	431	444	457	487	456	456	466	473	436	427	-0.9%	-0.1%
New Hampshire	789	935	999	1,054	992	975	889	840	890	863	9.3%	1.0%
New York	502	463	466	474	521	582	621	651	635	623	23.9%	2.4%
Rhode Island	938	998	960	963	939	933	981	815	652	753	-19.8%	-2.4%
Vermont	654	656	664	695	679	780	847	879	836	781	19.4%	2.0%
Wisconsin	752	731	761	816	797	798	774	768	743	719	-4.4%	-0.5%
NGS Total	655	605	637	675	673	701	721	733	720	705	7.6%	0.8%
PCPY		-7.7%	5.3%	6.0%	-0.2%	4.1%	2.9%	1.7%	-1.8%	-2.0%		
Noridian												
Alaska	488	531	331	224	360	540	783	682	656	788	61.4%	5.5%
Arizona	1,113	1,102	1,054	1,064	1,032	1,179	1,142	1,181	1,170	1,249	12.2%	1.3%
California	805	653	661	658	620	596	608	600	588	609	-24.3%	-3.0%
Idaho	517	497	529	481	492	624	624	593	609	691	33.7%	3.3%
Montana	698	572	688	697	655	665	702	681	607	712	2.0%	0.2%
Nevada	1,004	1,080	1,081	1,159	1,088	1,020	1,105	1,085	1,084	1,187	18.2%	1.9%
North Dakota	478	403	262	269	379	391	361	410	501	501	4.9%	0.5%
Oregon	463	434	410	396	450	466	527	564	545	573	23.7%	2.4%
South Dakota	1,147	959	753	517	558	681	669	788	793	894	-22.0%	-2.7%
Utah	851	868	781	989	1,060	1,141	1,226	1,195	1,146	1,268	49.0%	4.5%
Washington	662	560	477	402	410	424	448	470	497	543	-18.0%	-2.2%
Wyoming	835	830	632	613	866	948	889	822	736	729	-12.7%	-1.5%
Noridian Total	797	696	677	671	656	671	689	691	684	728	-8.7%	-1.0%

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	Rate
PCPY		-12.6%	-2.8%	-0.9%	-2.2%	2.3%	2.7%	0.3%	-1.0%	6.4%		
Palmetto, GBA												
North Carolina	793	713	735	807	776	766	825	860	896	885	11.6%	1.2%
South Carolina	1,095	970	1,032	1,168	1,298	1,423	1,482	1,406	1,445	1,402	28.1%	2.8%
Virginia	628	525	562	616	734	795	830	829	854	856	36.3%	3.5%
West Virginia	645	638	697	829	847	1,010	971	1,071	1,027	852	32.1%	3.1%
Palmetto Total	789	701	740	826	880	936	980	985	1,012	983	24.6%	2.5%
PCPY		-11.1%	5.5%	11.6%	6.6%	6.4%	4.6%	0.6%	2.7%	-2.8%		
Novitas												
Arkansas	1,130	1,080	964	962	1,025	1,111	1,262	1,391	1,463	1,583	40.1%	3.8%
Colorado	569	556	542	650	618	702	731	777	801	857	50.6%	4.7%
DC	4,133	3,799	4,117	3,965	5,084	5,590	6,439	6,029	5,848	5,975	44.6%	4.2%
Delaware	931	799	790	770	927	1,128	1,223	1,360	1,202	1,307	40.5%	3.8%
Louisiana	649	699	732	788	874	948	961	964	936	913	40.8%	3.9%
Maryland	861	738	830	856	980	1,059	1,089	952	896	915	6.3%	0.7%
Mississippi	1,066	948	1,005	1,138	1,168	1,118	1,223	1,242	1,224	1,223	14.8%	1.5%
New Jersey	611	639	682	699	736	824	892	924	889	883	44.5%	4.2%
New Mexico	628	634	659	774	713	740	810	760	819	923	47.0%	4.4%
Oklahoma	800	709	681	712	745	929	1,177	1,157	1,342	1,333	66.6%	5.8%
Pennsylvania	646	588	587	592	630	681	714	777	774	778	20.3%	2.1%
Texas	1,394	1,046	1,017	977	959	955	997	1,034	970	939	-32.6%	-4.3%
Novitas Total	937	811	815	829	860	914	980	1,008	989	994	6.0%	0.7%
PCPY		-13.5%	0.5%	1.7%	3.8%	6.2%	7.2%	2.9%	-1.9%	0.5%		
WPS												
Indiana	953	1,005	1,090	1,183	991	1,083	1,196	1,247	1,146	1,128	18.4%	1.9%
Iowa	400	450	510	514	510	525	623	715	642	630	57.3%	5.2%
Kansas	617	600	621	598	648	639	691	706	773	831	34.7%	3.4%
Michigan	1,536	1,292	1,354	1,489	1,459	1,733	1,775	1,448	1,168	1,010	-34.2%	-4.5%
Missouri	921	878	902	953	913	1,001	966	960	990	989	7.3%	0.8%
Nebraska	433	376	385	431	420	504	584	704	732	819	89.0%	7.3%
WPS Total	1,024	945	999	1,076	1,025	1,162	1,212	1,124	1,014	965	-5.8%	-0.7%
PCPY		-7.7%	5.6%	7.7%	-4.7%	13.4%	4.3%	-7.2%	-9.9%	-4.8%		
US TOTAL	913	825	833	848	817	857	894	909	903	896	-1.8%	-0.2%

PCPY: Percent of change from previous year; primary sessions or visits only ; WPS – Wisconsin Physician Service Insurance Corporation; NGS = National Government Services; CGS = CGS Administrators, LLC

Appendix Table 4. *Utilizations of Lumbar Facet Neurolysis injection sessions (rates per 100,000) in the Medicare population from 2009-2018 (2016 Medicare Carrier).*

State Name	R2009	R2010	R2011	R2012	R2013	R2014	R2015	R2016	R2017	R2018	Change	Rate
Cahaba												
Alabama	128	148	141	166	166	204	245	288	287	288	124.3%	9.4%
Georgia	535	408	437	475	469	523	585	624	687	742	38.8%	3.7%
Tennessee	193	202	233	312	275	309	364	420	472	473	144.9%	10.5%
Cahaba Total	309	269	289	338	324	367	423	469	513	538	73.9%	6.3%
PCPY		-13.1%	7.7%	16.8%	-4.2%	13.4%	15.0%	11.0%	9.5%	4.7%		
CGS												
Kentucky	298	313	363	453	504	495	528	623	739	809	171.8%	11.7%
Ohio	218	243	240	305	334	340	359	443	462	474	117.8%	9.0%
CGS Total	240	263	275	348	383	385	407	495	541	569	136.8%	10.1%
PCPY		9.5%	4.5%	26.4%	10.2%	0.5%	5.8%	21.4%	9.4%	5.2%		
First Coast												
Florida	443	364	353	403	402	470	533	603	589	626	41.3%	3.9%
PCPY		-17.8%	-3.2%	14.1%	-0.3%	17.1%	13.3%	13.2%	-2.3%	6.3%		
NGS												
Connecticut	95	96	126	142	158	193	208	248	276	308	223.0%	13.9%
Illinois	192	190	206	247	274	294	322	345	364	394	105.0%	8.3%
Maine	141	129	189	199	215	257	251	251	266	256	81.0%	6.8%
Massachusetts	186	211	230	265	279	274	295	319	334	353	89.9%	7.4%
Minnesota	132	122	135	151	168	179	183	209	211	219	65.3%	5.7%
New Hampshire	357	414	470	537	567	553	527	494	500	530	48.3%	4.5%
New York	139	136	145	160	197	235	246	255	277	298	114.3%	8.8%
Rhode Island	88	110	100	62	40	39	57	94	73	90	2.2%	0.2%
Vermont	237	245	217	233	297	291	336	314	297	268	12.8%	1.3%
Wisconsin	219	235	238	299	320	350	372	388	405	401	82.7%	6.9%
NGS Total	166	170	185	212	239	262	277	294	311	328	97.9%	7.9%
PCPY		2.4%	8.6%	14.9%	12.5%	9.8%	5.9%	6.0%	5.6%	5.7%		
Noridian												
Alaska	179	195	176	144	161	225	349	402	347	386	115.9%	8.9%
Arizona	353	428	461	505	572	622	657	747	806	905	156.5%	11.0%
California	145	155	177	187	204	219	231	246	249	255	75.6%	6.5%
Idaho	200	250	264	219	227	300	365	322	320	365	82.5%	6.9%
Montana	264	202	205	181	189	182	230	227	260	309	17.2%	1.8%
Nevada	238	300	340	454	496	537	611	669	664	735	209.5%	13.4%
North Dakota	205	167	137	108	142	177	177	218	272	282	37.8%	3.6%
Oregon	139	156	146	131	167	192	205	246	259	274	96.6%	7.8%
South Dakota	260	272	238	190	207	208	254	278	297	347	33.7%	3.3%
Utah	451	513	520	628	678	812	1,013	1,069	1,034	1,105	145.1%	10.5%
Washington	168	162	140	116	120	138	161	184	207	246	46.5%	4.3%
Wyoming	349	400	292	271	257	304	332	335	322	294	-15.8%	-1.9%
Noridian Total	192	211	223	234	259	287	315	343	356	385	100.6%	8.0%
PCPY		9.9%	6.1%	4.9%	10.6%	10.5%	10.1%	8.7%	3.8%	8.1%		

Palmetto GBA												
North Carolina	318	354	318	299	285	278	320	359	409	431	35.5%	3.4%
South Carolina	293	312	333	386	425	465	532	556	608	629	114.5%	8.8%
Virginia	133	156	150	162	213	257	306	346	381	391	193.5%	12.7%
West Virginia	281	340	301	308	355	322	367	417	453	413	47.2%	4.4%
Palmetto Total	254	285	269	276	300	316	365	402	447	460	81.3%	6.8%
PCPY		12.2%	-5.5%	2.8%	8.6%	5.2%	15.7%	10.1%	11.2%	2.8%		
Novitas												
Arkansas	685	615	523	538	649	767	910	1,123	1,216	1,316	92.1%	7.5%
Colorado	112	128	161	200	238	289	329	406	476	485	334.6%	17.7%
DC	1,112	1,258	1,553	1,452	2,232	2,706	3,188	3,522	3,383	3,695	232.2%	14.3%
Delaware	175	186	160	164	240	319	362	475	437	536	206.1%	13.2%
Louisiana	346	353	389	447	518	575	621	663	759	767	121.7%	9.2%
Maryland	297	291	339	373	426	510	588	556	538	552	85.9%	7.1%
Mississippi	299	337	391	386	421	397	410	534	563	596	99.4%	8.0%
New Jersey	167	170	188	207	256	321	370	393	378	402	141.7%	10.3%
New Mexico	172	186	246	308	242	300	346	402	449	474	175.4%	11.9%
Oklahoma	214	255	312	352	385	438	542	663	750	808	278.4%	15.9%
Pennsylvania	118	150	154	163	187	207	222	253	272	290	145.8%	10.5%
Texas	388	389	433	456	485	527	573	651	677	701	80.8%	6.8%
Novitas Total	276	287	315	338	380	430	481	548	576	605	119.7%	9.1%
PCPY		4.0%	9.7%	7.4%	12.6%	13.1%	11.9%	13.9%	5.1%	5.1%		
WPS												
Indiana	280	276	269	288	303	368	433	447	429	439	56.6%	5.1%
Iowa	110	124	154	168	175	187	223	260	243	274	148.8%	10.7%
Kansas	197	192	210	176	220	265	292	313	340	364	85.1%	7.1%
Michigan	264	296	281	325	342	374	389	395	389	392	48.1%	4.5%
Missouri	283	280	298	310	293	354	349	315	329	353	24.9%	2.5%
Nebraska	143	139	142	137	148	180	227	288	300	380	165.5%	11.5%
WPS Total	242	252	255	274	285	329	356	362	361	378	56.4%	5.1%
PCPY		4.4%	0.8%	7.6%	4.1%	15.4%	8.1%	1.8%	-0.4%	4.9%		
US Total	246	249	260	281	299	333	369	412	442	467	89.8%	7.4%

PCPY: Percent of change from previous year; primary sessions or visits only ; WPS – Wisconsin Physician Service Insurance Corporation; NGS = National Government Services; CGS = CGS Administrators, LLC

Appendix Table 5. *Utilizations of rate and services of facet joint intervention sessions by place of service.*

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Change	GM
ASC	164,151	165,322	182,611	201,479	206,951	226,984	255,222	283,928	300,287	317,056	93.1%	7.6%
Percent	24.0%	25.6%	26.8%	27.4%	27.4%	27.5%	9.9%	27.9%	27.9%	27.9%		
Rate	358.40	352	378	401	399	424	465	503	518	532	48.4%	4.5%
HOPD	150,356	153,076	166,331	178,806	185,453	197,478	213,073	236,836	247,673	261,222	73.7%	6.3%
Percent	22.0%	23.7%	24.4%	24.3%	24.6%	23.9%	23.7%	24.5%	24.5%	24.7%		
Rate	328	326	344	355	357	369	388	419	427	438	33.5%	3.3%
Office	368,396	326,799	333,472	354,226	361,518	400,825	429,447	447,104	463,327	477,293	29.6%	2.9%
Percent	53.9%	50.7%	48.9%	48.2%	48.0%	48.6%	47.8%	46.2%	45.8%	45.2%		
Rate	804	697	690	704	697	749	782	791	799	801	-0.4%	-0.05%
Total	682,903	645,197	682,414	734,511	753,922	825,287	897,742	967,868	1,011,287	1,055,571	54.6%	5.0%
Rate	1,491	1,375	1,413	1,460	1,453	1,543	1,635	1,713	1,744	1,771	18.8%	1.9%

Primary sessions or visits only
Rate: rates per 100,000 Medicare beneficiaries