

Trends in Volume and Utilization of Spine Surgeries from 2013 to 2021

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INTRODUCTION: As advancements in spine surgery are made, variations in utilization of new and traditional procedures can be expected. However, the recent fluctuations in the volume of spine procedures in the Medicare population has yet to be elucidated. Thus, this study was performed to determine changes in volume and utilization of individual procedures from 2013 to 2021 for Medicare beneficiaries.

METHODS: Publicly available data was obtained from the Medicare Part B database. The files were queried for individual CPT codes corresponding to commonly performed spine surgeries. Total number of cases per year per 100,000 beneficiaries was determined through the sum of all CPT codes. Descriptive statistics were used to determine percent change over time. Compound annual growth rate (CAGR) and percent change per 100,000 beneficiaries was calculated by CPT code and for total sum of cases to determine relative change in cases over time. Kendall's rank correlation coefficient was utilized to determine monotonicity by year per 100,000 beneficiaries.

RESULTS: The total number of cases increased from 709,467 in 2013 to a maximum of 873,719 in 2019, with a CAGR of 3.53%. The total number of cases increased from 1,383.51 to 1,450.33 per 100,000 beneficiaries at the same timepoints, with a CAGR of 0.79%. Overall, spine procedures per 100,000 beneficiaries decreased by 16.23% from 2013 to 2021, with most of the decrease occurring from 2019 to 2021. From 2013 to 2021, the number of cases decreased to 1,214.99 per 100,000 beneficiaries, with a decrease in CAGR of -1.61% from 2013 to 2021 and -8.47% from 2019 to 2021. Kendall's rank correlation coefficient demonstrated significant positive monotonicity in 8 of the 38 CPT codes ($p \leq 0.048$, all) and negative monotonicity in 19 of the 38 CPT codes ($p \leq 0.036$, all).

DISCUSSION AND CONCLUSION: Utilization of individual spine procedures in the Medicare population have experienced significant variation over time. Our study demonstrates a decrease in volume of spine procedures from 2013 to 2021, with most of the decrease occurring from 2019 to 2021, which corresponds to the years of the COVID-19 pandemic.

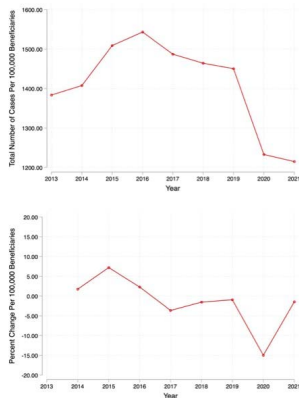


Fig. 1. Total number of cases (top) and percent change of cases (bottom) per 100,000 beneficiaries from 2013 to 2021.

CPT Code	Percent change from first recorded date to		Percent change from 2019 to 2021
	2019	2021	
03030	-21.03	-21.66	-17.66
03047	113.99	84.46	-13.80
20812	109.78	96.96	-4.11
22830	9.33	-7.76	-16.63
22598	869.40	642.90	-4.80
03042	-4.31	-22.34	-18.84
03051	71.13	29.62	-24.26
03055	-2.82	-17.87	-15.60
03287	636.28	549.37	-11.80
03056	377.29	210.06	-17.62
22845	228.72	176.25	-15.96
22554	64.62	-73.69	-25.21
22590	111.92	127.40	7.30
22114	-68.77	-68.77	0.00
22840	668.98	578.99	-11.70
02380	54.01	11.63	-27.82
03051	196.16	196.87	-1.86
03003	280.20	230.03	-13.19
03000	-12.87	-42.34	-23.63
03045	216.40	194.89	-4.80
03046	424.15	298.28	-23.52
03055	150.10	150.06	3.08
22856	1,767.77	1,713.22	-3.02
22551	52.28	27.64	-16.34
27279	229.86	495.40	80.50
22510	-98.38	-50.11	-20.92
22511	-21.38	-47.61	-33.36
22513	8.86	-10.54	-17.62
22514	8.46	-9.29	-16.37
03050	18.03	-4.56	-20.63
22848	5,880.25	6,063.06	3.06
22842	273.12	291.08	6.59
22843	914.25	934.84	2.03
22844	600.38	570.28	-11.85
22633	46.46	31.90	-8.33
22600	547.53	517.43	-4.85
22852	186.62	184.33	-4.87
22804	121.57	128.76	3.24
Sum	218.97	183.72	-11.09

*Initial recorded date for CPT 02380 was 2017, CPT 22856 was 2009, CPT 22551 was 2011, CPT 27279 was 2015, CPT 22510 was 2015, CPT 22511 was 2015, CPT 22513 was 2016, CPT 22514 was 2016, and CPT 22633 was 2012. All other CPT codes had an initial recorded date of 2000.