**Table 1.** Characteristics of the Medicare beneficiaries and epidural procedures excluding percutaneous adhesiolysis, continuous epidurals, and neurolytic epidurals.

|  |  |  |  |
| --- | --- | --- | --- |
| Year | U.S. Population(thousands)(Percent) # | MedicareBeneficiaries(thousands)(Percent)# | Epidural Services\* |
| Services(all Codes) | PCPY | Rate | PCPY | Services(Primary codes only) | Rate | PCPY |
| Y2000 | 282,172(12.40%) | 39,632(86.50%) | 839,474 |  | 2,118 |  | 792,563 | 2,000 |  |
| Y2010 | 308,746(13.00%) | 46,914(83.11%) | 2,205,307 | 4.4% | 4,701 | 1.9% | 1,792,291 | 3,820 | 0.9% |
| Y2011 | 311,583(13.28%) | 48,300(82.82%) | 2,289,213 | 3.8% | 4,740 | 0.8% | 1,864,066 | 3,859 | 1.0% |
| Y2012 | 313,874(13.75%) | 50,300(83.30%) | 2,304,993 | 0.7% | 4,582 | -3.3% | 1,892,951 | 3,763 | -2.5% |
| Y2013 | 316,129(14.14%) | 51,900(83.04%) | 2,259,887 | -2.0% | 4,354 | -5.0% | 1,854,380 | 3,573 | -5.1% |
| Y2014 | 318,892(14.48%) | 53,500(83.36%) | 2,255,668 | -0.2% | 4,216 | -3.2% | 1,826,336 | 3,414 | -4.5% |
| Y2015 | 320,897(14.88%) | 54,900(83.79%) | 2,276,267 | 0.9% | 4,146 | -1.7% | 1,845,604 | 3,362 | -1.5% |
| Y2016 | 323,127(15.24%) | 56,500(84.07%) | 2,316,285 | 1.8% | 4,100 | -1.1% | 1,882,269 | 3,331 | -0.9% |
| Y2017 | 326,625(15.63%) | 58,000(84.83%) | 2,247,240 | -3.0% | 3,875 | -5.5% | 1,835,796 | 3,165 | -5.0% |
| Y2018 | 327,167(16.0%) | 59,600(85.23%) | 2,186,893 | -2.7% | 3,669 | -5.3% | 1,788,915 | 3,002 | -5.2% |
| Y2019 | 328,293(16.47%) | 61,200(85.95%) | 2,184,917 | -0.1% | 3,570 | -2.7% | 1,784,870 | 2,916 | -2.8% |
| Y2020 | 331,00216.90%) | 62,600(86.42%) | 1,810,884 | -17.1% | 2,893 | -19.0% | 1,473,789 | 2,354 | -19.3% |
| **Percentage of Change from** |  |  |  |  |  |  |  |
| 2000-2020 | 17.3% | 58.0% | 115.7% |  | 36.6% |  | 86.0% | 17.7% |  |
| GM | 0.8% | 2.3% | 3.9% |  | 1.6% |  | 3.2% | 0.8% |  |
| 2000-2010 | 9.4% | 18.4% | 162.7% |  | 121.9% |  | 126.1% | 91.0% |  |
| GM | 0.9% | 1.7% | 10.1% |  | 8.3% |  | 8.5% | 6.7% |  |
| 2010-2019 | 6.3% | 30.5% | -0.9% |  | -24.1% |  | -0.4% | -23.7% |  |
| Change | 0.7% | 3.0% | -0.1% |  | -3.0% |  | 0.0% | -3.0% |  |
| 2010-2020 | 7.2% | 33.4% | -17.9% |  | -38.5% |  | -17.8% | -38.4% |  |
| GM | 0.7% | 2.9% | -2.0% |  | -4.7% |  | -1.9% | -4.7% |  |
| 2019-2020 | 0.8% | 2.3% | -17.1% |  | -19.0% |  | -17.4% | -19.3% |  |

**Rate** – Rate per 100,000 Medicare beneficiaries, GM - Geometric average change # (percentage of >= 65 years old) (annual change indicates the central tendency or typical value of a set of numbers by using the product of their values as opposed to the arithmetic mean, which uses their sum).

PCPY: percentage change per year

**Epidural Services** = 62310, 62320, 62321 C/T or interlaminar epidural injections; 62311, 62322, 62323-L/S interlaminar epidural injections; 64479- C/T transforaminal epidural injections; 64480- C/T transforaminal epidural injections add-on; 64483-L/S transforaminal epidural injections; 64484-L/S transforaminal epidural injections add-on

**Table 2.***Utilizations of epidural injections in the fee-for-service Medicare population from 2000-2020.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Cervical/Thoracic Interlaminar Epidurals(CPT 62310, 62321) | Lumbar Interlaminar and Caudal Epidurals (CPT 62311, 62323) | Cervical/ThoracicTransforaminal Epidurals(CPT 64479, 64480) | Lumbar/SacralTransforaminal Epidurals(CPT 64483, 64484) |
| Year | Services | Rate | Services | Rate | Services | Rate | Services | Rate |
| 2000 | 75,741 | 191 | 618,362 | 1,560 | 22,888 | 58 | 122,483 | 309 |
| 2010 | 184,750 | 394 | 888,421 | 1,894 | 69,891 | 149 | 1,062,245 | 2,264 |
| 2011 | 200,134 | 414 | 914,324 | 1,893 | 65,598 | 136 | 1,109,157 | 2,296 |
| 2012 | 213,390 | 424 | 925,179 | 1,839 | 57,238 | 114 | 1,109,186 | 2,205 |
| 2013 | 217,393 | 419 | 901,468 | 1,737 | 55,108 | 106 | 1,085,918 | 2,092 |
| 2014 | 208,741 | 390 | 815,858 | 1,525 | 59,531 | 111 | 1,171,538 | 2,190 |
| 2015 | 215,897 | 393 | 820,227 | 1,494 | 58,970 | 107 | 1,181,173 | 2,151 |
| 2016 | 224,118 | 397 | 824,822 | 1,460 | 59,208 | 105 | 1,208,137 | 2,138 |
| 2017 | 223,060 | 385 | 788,456 | 1,359 | 56,563 | 98 | 1,179,161 | 2,033 |
| 2018 | 220,470 | 370 | 751,846 | 1,261 | 54,435 | 91 | 1,160,142 | 1,947 |
| 2019 | 221,462 | 362 | 737,394 | 1,205 | 54,048 | 88 | 1,172,013 | 1,915 |
| 2020 | 183,699 | 293 | 596,369 | 953 | 45,149 | 72 | 985,667 | 1,575 |
| Change from |  |  |  |  |  |  |  |
| 2000-2020 | 142.5% | 53.5% | -3.6% | -38.9% | 97.3% | 24.9% | 704.7% | 409.5% |
| **Rate** | **4.5%** | **2.2%** | **-0.2%** | **-2.4%** | **3.5%** | **1.1%** | **11.0%** | **8.5%** |
| 2000-2010 | 143.9% | 106.1% | 43.7% | 21.4% | 205.4% | 158.0% | 767.3% | 632.6% |
| **Rate** | **8.2%** | **6.5%** | **2.4%** | **0.8%** | **11.6%** | **9.9%** | **19.5%** | **17.6%** |
| 2010-2019 | 19.9% | -8.1% | -17.0% | -36.4% | -22.7% | -40.7% | 10.3% | -15.4% |
| **Rate** | **2.0%** | **-0.9%** | **-2.0%** | **-4.9%** | **-2.8%** | **-5.6%** | **1.1%** | **-1.8%** |
| 2010-2020 | -0.6% | -25.5% | -32.9% | -49.7% | -35.4% | -51.6% | -7.2% | -30.5% |
| **Rate** | **-0.1%** | **-2.9%** | **-3.9%** | **-6.6%** | **-4.3%** | **-7.0%** | **-0.7%** | **-3.6%** |
| 2019-2020 | -17.1% | -18.9% | -19.1% | -20.9% | -16.5% | -18.3% | -15.9% | -17.8% |

**Epidural Services** = 62310, 62320, 62321 C/T or interlaminar epidural injections; 62311, 62322, 62323-L/S interlaminar epidural injections

**Table 3.** *Utilization patterns of epidural injections by various specialty groups from 2000 to 2020 in Medicare recipients.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Interventional Pain Management #** | **Surgical (Neuro, General, & Orthopedic)** | **Radiology**  | **General Physicians** | **Other Providers** **(CRNA, NP & PA)** | **Total** |
| Specialty  | **Services** | Rate | **Services** | Rate | **Services** | Rate | **Services** | Rate | **Services** | Rate | **Services** | Rate |
| 2000 | 702,731(83.7%) | 1,773 | 47,213(5.6%) | 119 | 22,794(2.7%) | 58 | 52,429(6.2%) | 132 | 14,307(1.7%) | 36 | 839,474 | 2,118 |
| 2010 | 1,911,762(86.7%) | 4,075 | 126,119(5.7%) | 269 | 83,670(3.8%) | 178 | 65,610(3.0%) | 140 | 18,146(0.8%) | 39 | 2,205,307 | 4,701 |
| 2011 | 2,008,135(87.7%) | 4,158 | 117,001(5.1%) | 242 | 87,447(3.8%) | 181 | 58,974(2.6%) | 122 | 17,656(0.8%) | 37 | 2,289,213 | 4,740 |
| 2012 | 2,038,618(88.4%) | 4,053 | 111,135(4.8%) | 221 | 88,123(3.8%) | 175 | 50,243(2.2%) | 100 | 16,874(0.7%) | 34 | 2,304,993 | 4,582 |
| 2013 | 2,008,620(88.9%) | 3,870 | 103,000(4.6%) | 198 | 82,766(3.7%) | 159 | 49,848(2.2%) | 96 | 15,653(0.7%) | 30 | 2,259,887 | 4,354 |
| 2014 | 2,019,328(89.5%) | 3,774 | 100,658(4.5%) | 188 | 82,257(3.6%) | 154 | 39,876(1.8%) | 75 | 13,549(0.6%) | 25 | 2,255,668 | 4,216 |
| 2,015 | 2,045,138(89.8%) | 3,725 | 100,262(4.4%) | 183 | 81,034(3.6%) | 148 | 36,088(1.6%) | 66 | 13,745(0.6%) | 25 | 2,276,267 | 4,146 |
| 2,016 | 2,086,614(90.1%) | 3,693 | 97,656(4.2%) | 173 | 82,397(3.6%) | 146 | 34,722(1.5%) | 61 | 14,896(0.6%) | 26 | 2,316,285 | 4,100 |
| 2,017 | 2,028,083(90.2%) | 3,497 | 92,546(4.1%) | 160 | 81,559(3.6%) | 141 | 31,275(1.4%) | 54 | 13,777(0.6%) | 24 | 2,247,240 | 3,875 |
| 2,018 | 1,980,578(90.6%) | 3,323 | 88,170(4.0%) | 148 | 76,959(3.5%) | 129 | 27,527(1.3%) | 46 | 13,659(0.6%) | 23 | 2,186,893 | 3,669 |
| 2,019 | 1,976,335(90.5%) | 3,229 | 87,605(4.0%) | 143 | 78,160(3.6%) | 128 | 28,176(1.3%) | 46 | 14,641(0.7%) | 24 | 2,184,917 | 3,570 |
| 2,020 | 1,643,271(90.7%) | 2,625 | 73,261(4.0%) | 117 | 58,491(3.2%) | 93 | 24,314(1.3%) | 39 | 11,547(0.6%) | 18 | 1,810,884 | 2,893 |
|  2000-2020  | 133.8% | 48.0% | 55.2% | -1.8% | 156.6% | 62.5% | -53.6% | -70.6% | -19.3% | -48.9% | 115.7% | 36.6% |
|  GM  | 4.3% | 2.0% | 2.2% | -0.1% | 4.8% | 2.5% | -3.8% | -5.9% | -1.1% | -3.3% | 3.9% | 1.6% |
| 2000-2010 | 172.0% | 129.8% | 167.1% | 125.7% | 267.1% | 210.1% | 25.1% | 5.7% | 26.8% | 7.1% | 162.7% | 121.9% |
| GM | 10.5% | 8.7% | 10.3% | 8.5% | 13.9% | 12.0% | 2.3% | 0.6% | 2.4% | 0.7% | 10.1% | 8.3% |
| 2010-2019 | 3.4% | -20.8% | -30.5% | -46.8% | -6.6% | -28.4% | -57.1% | -67.1% | -19.3% | -38.1% | -0.9% | -24.1% |
| GM | 0.4% | -2.6% | -4.0% | -6.8% | -0.8% | -3.6% | -9.0% | -11.6% | -2.4% | -5.2% | -0.1% | -3.0% |
|  2010-2020  | -14.0% | -35.6% | -41.9% | -56.5% | -30.1% | -47.6% | -62.9% | -72.2% | -36.4% | -52.3% | -17.9% | -38.5% |
|  GM  | -1.5% | -4.3% | -5.3% | -8.0% | -3.5% | -6.3% | -9.4% | -12.0% | -4.4% | -7.1% | -2.0% | -4.7% |
| 2,019 | -16.9% | -18.7% | -16.4% | -18.2% | -25.2% | -26.8% | -13.7% | -15.6% | -21.1% | -22.9% | -17.1% | -19.0% |

Rate - Per 100,000 Medicare Beneficiaries; GM: Geometric change (Annual change indicates the central tendency or typical value of a set of numbers by using the product of their values as opposed to the arithmetic mean, which uses their sum)

IPM (Interventional Pain Management): Anesthesiology, Pain Management, PM&R, Neurology, Psychiatry,

General Physicians: Family Practice, General Practice & Internal Medicine

(%) – percentage to total

**Table 4.** *Utilizations of epidural injections (rates per 100,000) in the Medicare population from 2010-2020.*

| Carrier | R2010 | R2011 | R0212 | R2013 | 3R2014 | R2015 | R2016 | R2017 | R2018 | R2019 | R2020 | 2010-2019 | Rate | 2010-2020 | GM | 2019-20 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CGS | 4,404 | 4,415 | 4,359 | 4,097 | 3,831 | 3,711 | 3,753 | 3,551 | 3,326 | 3,191 | 2,531 | -27.5% | -3.5% | -42.5% | -5.4% | -20.7% |
|  PCPY | -2.1% | 0.2% | -1.3% | -6.0% | -6.5% | -3.1% | 1.1% | -5.4% | -6.3% | -4.1% | -20.7% |  |  |  |  |  |
| Cahaba | 5,525 | 5,797 | 5,817 | 5,286 | 5,131 | 5,266 | 5,034 | 4,524 | 4,202 | 4,120 | 3,335 | -25.4% | -3.2% | -39.6% | -4.9% | -19.1% |
|  PCPY | -4.9% | 4.9% | 0.3% | -9.1% | -2.9% | 2.6% | -4.4% | -10.1% | -7.1% | -1.9% | -19.1% |  |  |  |  |  |
| Palmetto | 4,806 | 5,069 | 5,114 | 4,933 | 4,704 | 4,774 | 4,655 | 4,391 | 4,219 | 4,197 | 3,520 | -12.7% | -1.5% | -26.8% | -3.1% | -16.1% |
|  PCPY | 1.6% | 5.5% | 0.9% | -3.5% | -4.6% | 1.5% | -2.5% | -5.7% | -3.9% | -0.5% | -16.1% |  |  |  |  |  |
| First Coast | 5,793 | 5,707 | 5,456 | 5,074 | 4,970 | 5,017 | 4,767 | 4,322 | 4,148 | 4,023 | 3,418 | -30.5% | -4.0% | -41.0% | -5.1% | -15.0% |
|  PCPY | -2.1% | -1.5% | -4.4% | -7.0% | -2.0% | 1.0% | -5.0% | -9.3% | -4.0% | -3.0% | -15.0% |  |  |  |  |  |
| Novitas | 5,281 | 5,342 | 5,142 | 5,014 | 4,973 | 5,088 | 4,848 | 4,458 | 4,169 | 4,098 | 3,307 | -22.4% | -2.8% | -37.4% | -4.6% | -19.3% |
|  PCPY | 2.0% | 1.1% | -3.7% | -2.5% | -0.8% | 2.3% | -4.7% | -8.1% | -6.5% | -1.7% | -19.3% |  |  |  |  |  |
| NGS | 3,573 | 3,626 | 3,620 | 3,565 | 3,471 | 3,466 | 3,342 | 3,149 | 2,958 | 2,958 | 2,306 | -17.2% | -2.1% | -35.4% | -4.3% | -22.0% |
|  PCPY | 2.9% | 1.5% | -0.2% | -1.5% | -2.6% | -0.2% | -3.6% | -5.8% | -6.1% | 0.0% | -22.0% |  |  |  |  |  |
| Noridian | 3,830 | 3,948 | 4,010 | 3,961 | 3,763 | 3,824 | 3,552 | 3,261 | 3,193 | 3,150 | 2,583 | -17.8% | -2.1% | -32.6% | -3.9% | -18.0% |
|  PCPY | 4.8% | 3.1% | 1.6% | -1.2% | -5.0% | 1.6% | -7.1% | -8.2% | -2.1% | -1.4% | -18.0% |  |  |  |  |  |
| WPS | 5,791 | 5,611 | 5,515 | 5,293 | 5,091 | 4,990 | 4,705 | 4,275 | 4,017 | 3,843 | 3,011 | -33.6% | -4.5% | -48.0% | -6.3% | -21.7% |
|  PCPY | 7.2% | -3.1% | -1.7% | -4.0% | -3.8% | -2.0% | -5.7% | -9.1% | -6.1% | -4.3% | -21.7% |  |  |  |  |  |
| US Total | 4,701 | 4,740 | 4,582 | 4,354 | 4,216 | 4,146 | 4,100 | 4,013 | 3,669 | 3,570 | 2,893 | -24.1% | -3.0% | -38.5% | -4.7% | -19.0% |
|  PCPY | 1.9% | 0.8% | -3.3% | -5.0% | -3.2% | -1.7% | -1.1% | -2.1% | -8.6% | -2.7% | -19.0% |  |  |  |  |  |

GM: Geometric change (Annual change indicates the central tendency or typical value of a set of numbers by using the product of their values as opposed to the arithmetic mean, which uses their sum)

PCPY: percentage change from previous year



**Fig. 1.** *Analysis of annual growth in the Medicare beneficiaries of utilization of epidural services and rate per 100,000 Medicare beneficiaries*.



**Fig 2.** *Change in the rate of frequency of utilization of epidural injections (annual change) per 100,000 Medicare beneficiaries stratified by the type of procedure.*

**Fig. 3.** *Analysis of frequency of utilization of growth of epidural procedures (all procedures, including the add-on codes) stratified by type of procedure from 2000 to 2020 in Medicare beneficiaries.*



**Fig. 4.** *Analysis of annual rates of growth of epidural procedures (all procedures, including the add-on codes) compared to utilization of all other interventional pain management services as shown in reference (3).*