

A Cross-sectional Analysis of Regional Trends in Medicare Reimbursement for Phototherapy Services From 2010 to 2023

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PRACTICE POINTS

- After weighting for procedure utilization, mean reimbursement for phototherapy increased across all US regions from 2010 to 2023 (mean change, +28.62%), yet with marked regional diversity.
- The southern United States reported the least growth in weighted mean reimbursement (+15.41%), and the western United States reported the greatest growth in weighted mean reimbursement (+51.16%).
- Region- and procedure-specific payment changes are especially valuable to dermatologists and policymakers alike, potentially reinvigorating payment reform discussions.

To the Editor:

Phototherapy regularly is utilized in the outpatient setting to address various skin pathologies, including atopic dermatitis, psoriasis, pruritus, vitiligo, and mycosis fungoides.^{1,2} Phototherapy is broadly defined by the measured administration of nonionizing radiation within the UV range including wavelengths within the UVA (eg, psoralen sensitizer plus UVA-1) and UVB (eg, broadband UVB, narrowband UVB) spectrums.^{1,3} Generally, the mechanism of action is derived from effects on

inflammatory components of cutaneous disorders and the induction of apoptosis, both precipitating numerous downstream events.⁴

From 2015 to 2018, there were more than 1.3 million outpatient phototherapy visits in the United States, with the most common procedural indications being dermatitis not otherwise specified, atopic dermatitis, and pruritus.⁵ From 2000 to 2015, the quantity of phototherapy services billed to Medicare trended upwards by an average of 5% per year, increasing from 334,670 in the year 2000 to 692,093 in 2015.⁶ Therefore, an illustration of associated costs would be beneficial. Additionally, because total cost and physician reimbursement fluctuate from year to year, studies demonstrating overall trends can inform both US policymakers and physicians. There is a paucity of research on geographical trends for procedural reimbursements in dermatology for phototherapy. Understanding geographic trends of reimbursement could duly serve to optimize dermatologist practice patterns involving access to viable and quality care for patients seeking treatment as well as draw health policymakers' attention to striking adjustments in physician fees. Therefore, in this study we aimed to illustrate the most recent regional payment trends in phototherapy procedures for Medicare B patients.

We queried the Centers for Medicare & Medicaid Services Medicare Physician Fee Schedule (MPFS)

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database (<https://www.cms.gov/medicare/payment/fee-schedules/physician/lookup-tool>) for the years 2010 to 2023 for *Current Procedural Terminology* (CPT) codes common to phototherapy procedures: actinotherapy (96900); photochemotherapy by Goeckerman treatment or using petrolatum and UVB (96910); photochemotherapy using psoralen plus UVA (96912); and photochemotherapy of severe dermatoses requiring a minimum of 4 hours of care under direct physician supervision (96913). Nonfacility prices for these procedures were analyzed. For 2010, due to midyear alterations to Medicare reimbursement (owed to bills HR 3962 and HR 4872), the mean price data of MPFS files 2010A and 2010B were used. All dollar values were converted to January 2023 US dollars using corresponding consumer price index inflation data. The Medicare Administrative Contractors were used to group state pricing information by region in accordance with established US Census Bureau subdivisions (<https://www.census.gov/programs-surveys/economic-census/guidance-geographies/levels.html>). Weighted percentage change in reimbursement rate was calculated using physician (MD or DO) utilization (procedure volume) data available in the 2020 Physician and Other Practitioners Public Use File (<https://data.cms.gov/provider-summary-by-type-of-service/medicare-physician-other-practitioners/medicare-physician-other-practitioners-by-provider-and-service>). All descriptive statistics and visualization were generated using R software (v4.2.2)(R Development Core Team).

Table 1 provides physician utilization data and the corresponding number of Part B beneficiaries for phototherapy procedures in 2020. There were 65,045 services of actinotherapy provided to a total of 6855 unique Part B beneficiaries, 173,979 services of photochemotherapy by Goeckerman treatment or using petrolatum and UVB provided to 13,122 unique Part B beneficiaries, 2524 services of photochemotherapy using psoralen plus UVA provided to a total of 357 unique Part B beneficiaries, and 37 services of photochemotherapy of severe dermatoses requiring a minimum of 4 hours of care under direct

physician supervision provided to a total of 27 unique Part B beneficiaries.

On average (unweighted), phototherapy reimbursement rates in the North increased by 0.68% between 2010 and 2023 (Table 2). After weighting for 2020 physician utilization, the average change in reimbursement rate was +19.37%. During this time period, CPT code 96910 reported the greatest adjusted increase in reimbursement (+31.45%)($\$98.12$ to $\$128.98$; compound annual growth rate [CAGR], +0.0213), and CPT code 96912 reported the greatest adjusted decrease in reimbursement (−12.76%)($\$126.09$ to $\$109.97$; CAGR, −0.0105). For CPT code 96900, the reported adjusted decrease in reimbursement was −11.68% ($\$30.21$ to $\$26.68$; CAGR, −0.0095), and for CPT code 96913, the reported adjusted decrease in reimbursement was −4.27% ($\$174.03$ to $\$166.60$; CAGR, −0.0034).

On average (unweighted), phototherapy reimbursement rates in the Midwest increased by 8.40% between 2010 and 2023 (Table 3). After weighting for 2020 physician utilization, the average change in reimbursement rate was +28.53%. During this time period, CPT code 96910 reported the greatest adjusted change in reimbursement (+41.48%)($\$80.42$ to $\$113.78$; CAGR, +0.0270), and CPT code 96912 reported the greatest adjusted decrease in reimbursement (−6.14%)($\$103.28$ to $\$97.03$; CAGR, −0.0049). For CPT code 96900, the reported adjusted decrease in reimbursement was −4.73% ($\$24.69$ to $\$23.52$; CAGR, −0.0037), and for CPT code 96913, the reported adjusted increase in reimbursement was +2.99% ($\$142.72$ to $\$146.99$; CAGR, +0.0023).

On average (unweighted), phototherapy reimbursement rates in the South decreased by 2.62% between 2010 and 2023 (Table 4). After weighting for 2020 physician utilization, the average change in reimbursement rate was +15.41%. During this time period, CPT code 96910 reported the greatest adjusted change in reimbursement (+27.26%)($\$90.40$ to $\$115.04$ USD; CAGR, +0.0187), and CPT code 96912 reported the greatest adjusted decrease in reimbursement (−15.50%)($\$116.08$ to $\$98.09$;

TABLE 1. Utilization and Payment for Selected Phototherapy Procedures in 2020

CPT code	Description	Physician utilization, n (%)	Total beneficiaries, n (%)
96900	Actinotherapy (UVA or UVB therapy)	65,045 (26.92)	6855 (33.67)
96910	Photochemotherapy by Goeckerman treatment or using petrolatum and UVB	173,979 (72.02)	13,122 (64.45)
96912	Photochemotherapy using psoralen plus UVA	2524 (1.04)	357 (1.75)
96913	Photochemotherapy of severe dermatoses requiring a minimum of 4 hours of care under direct physician supervision	37 (0.02)	27 (0.13)

Abbreviation: CPT, *Current Procedural Terminology*.

CAGR, -0.0129). For CPT code 96900, the reported adjusted decrease in reimbursement was -15.06% (\$28.02 to \$23.80; CAGR, -0.0125), and for CPT code 96913, the reported adjusted decrease in reimbursement was -7.19% (\$160.11 to \$148.61; CAGR, -0.0057).

On average (unweighted), phototherapy reimbursement rates in the West increased by 27.53% between 2010 and 2023 (Table 5). After weighting for 2020 physician utilization, the average change in reimbursement rate was $+51.16\%$. Reimbursement for all analyzed procedures increased in the western United States. During this time period, CPT code 96910 reported the greatest adjusted increase in reimbursement ($+66.56\%$) (\$80.84 to \$134.65; CAGR, $+0.0400$), and CPT code 96912 reported the lowest adjusted increase in reimbursement ($+10.64\%$) (\$103.88 to \$114.93; CAGR, $+0.0078$). For CPT code 96900, the reported adjusted increase in reimbursement was 11.54% (\$24.88 to \$27.75;

CAGR, $+0.0084$), and for CPT code 96913, the reported adjusted increase in reimbursement was 21.38% (\$143.39 to \$174.04; CAGR, $+0.0150$).

In this study evaluating geographical payment trends for phototherapy from 2010 to 2023, we demonstrated regional inconsistency in mean inflation-adjusted Medicare reimbursement rates. We found that all phototherapy procedures had increased reimbursement in the western United States, whereas all other regions reported cuts in reimbursement rates for at least half of the analyzed procedures. After adjusting for procedure utilization by physicians, weighted mean reimbursement for phototherapy increased in all US regions.

In a cross-sectional study that explored trends in the geographic distribution of dermatologists from 2012 to 2017, dermatologists in the northeastern and western United States were more likely to be located in higher-income zip codes, whereas dermatologists in the

TABLE 2. Part B Medicare Payment Trends for Phototherapy in the Northeastern United States (2010-2023)

CPT code	Average reimbursement rate in 2010 (unadjusted), \$	Average reimbursement rate in 2010 (adjusted to January 2023 USD), \$	Average reimbursement rate in 2023, \$	Adjusted change in reimbursement (2010-2023), %	CAGR
96900	21.89	30.21	26.68	-11.68	-0.0095
96910	71.10	98.12	128.98	31.45	0.0213
96912	91.37	126.09	109.97	-12.78	-0.0105
96913	126.11	174.03	166.60	-4.27	-0.0034
Unweighted average	77.62	107.11	108.06	0.68	-0.0005

Abbreviations: CAGR, compound annual growth rate; CPT, Current Procedural Terminology; USD, US dollars.

TABLE 3. Part B Medicare Payment Trends for Phototherapy in the Midwestern United States (2010-2023)

CPT code	Average reimbursement rate in 2010 (unadjusted), \$	Average reimbursement rate in 2010 (adjusted to January 2023 USD), \$	Average reimbursement rate in 2023, \$	Adjusted change in reimbursement (2010-2023), %	CAGR
96900	17.89	24.69	23.52	-4.73	-0.0037
96910	58.28	80.42	113.78	41.48	0.02705
96912	74.91	103.38	97.03	-6.14	-0.0049
96913	103.42	142.72	146.99	2.99	0.0023
Unweighted average	78.87	87.80	95.33	8.40	0.0052

Abbreviations: CAGR, compound annual growth rate; CPT, Current Procedural Terminology; USD, US dollars.

southern United States were more likely to be located in lower-income zip codes,⁷ suggesting that payment rate changes are not concordant with cost of living. Additionally, Lauck and colleagues⁸ observed that 75% of the top 20 most common procedures performed by dermatologists had decreased reimbursement (mean change, -10.8%) from 2011 to 2021. Other studies on Medicare reimbursement trends over the last 2 decades have reported major decreases within other specialties, suggesting that declining Medicare reimbursements are not unique to dermatology.^{9,10} It is critical to monitor these developments, as the Centers for Medicare & Medicaid Services emphasized health care policy changes aimed at increasing reimbursements for evaluation and management services with compensatory payment cuts in billing for procedural services.¹¹

Mazmudar et al¹² previously reported a mean reimbursement decrease of -6.6% for laser/phototherapy

procedures between 2007 and 2021, but these data did not include the heavily utilized Goeckerman treatment. Changes in reimbursement pose major ramifications for dermatologists—for practice size, scope, and longevity—as rates influence changes in commercial insurance reimbursements.¹³ Medicare plays a major role in the US health care system as the second largest expenditure¹⁴; indeed, between 2000 and 2015, Part B billing volume for phototherapy procedures increased 5% annually. However, phototherapy remains inaccessible in many locations due to unequal regional distribution of phototherapy clinics.⁶ Moreover, home phototherapy units are not yet widely utilized because of safety and efficacy concerns, lack of physician oversight, and difficulty obtaining insurance coverage.¹⁵ Acknowledgment and consideration of these geographical trends may persuasively allow policymakers, hospitals, and physicians to facilitate cost-effective phototherapy reimbursements that ensure continued

TABLE 4. Part B Medicare Payment Trends for Phototherapy in the Southern United States (2010-2023)

CPT code	Average reimbursement rate in 2010 (unadjusted), \$	Average reimbursement rate in 2010 (adjusted to January 2023 USD), \$	Average reimbursement rate in 2023, \$	Adjusted change in reimbursement (2010-2023), %	CAGR
96900	20.31	28.02	23.80	-15.06	-0.0125
96910	65.51	90.40	115.04	27.26	0.0187
96912	84.11	116.08	98.09	-15.50	-0.0129
96913	116.02	160.11	148.61	-7.19	-0.0057
Unweighted average	71.49	98.65	96.39	-2.62	-0.0031

Abbreviations: CAGR, compound annual growth rate; CPT, Current Procedural Terminology; USD, US dollars.

TABLE 5. Part B Medicare Payment Trends for Phototherapy in the Western United States (2010-2023)

CPT code	Average reimbursement rate in 2010 (unadjusted), \$	Average reimbursement rate in 2010 (adjusted to January 2023 USD), \$	Average reimbursement rate in 2023, \$	Adjusted change in reimbursement (2010-2023), %	CAGR
96900	18.03	24.88	27.75	11.54	0.0084
96910	58.58	80.84	134.65	66.56	0.0400
96912	75.27	103.88	114.93	10.64	0.0078
96913	103.90	143.39	174.04	21.38	0.0150
Unweighted average	63.95	88.25	112.84	27.53	0.0178

Abbreviations: CAGR, compound annual growth rate; CPT, Current Procedural Terminology; USD, US dollars.

access to quality and sustainable dermatologic care in the United States that tailor to regional needs.

In sum, this analysis reveals regional trends in Part B physician reimbursement for phototherapy procedures, with all US regions reporting a mean increase in phototherapy reimbursement after adjusting for utilization, albeit to varying degrees. Mean reimbursement for photochemotherapy by Goeckerman treatment or using petrolatum and UVB increased most among phototherapy procedures. Mean reimbursement for both actinotherapy and photochemotherapy using psoralen plus UVA decreased in all regions except the western United States.

Limitations include the restriction to Part B MPFS and the reliance on single-year (2020) physician utilization data to compute weighted changes in average reimbursement across a multiyear range, effectively restricting sweeping conclusions. Still, this study puts forth actionable insights for dermatologists and policymakers alike to appreciate and consider.

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