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Cost Differences Associated With Oncology Care Delivered in a Community Setting Versus a Hospital Setting: A Matched-Claims Analysis of Patients With Breast, Colorectal, and Lung Cancers

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QUESTIONS ASKED: Are there financial ramifications associated with the paradigm shift of cancer care delivery away from community-based clinics (CCs) and toward hospital-based oncology clinics (HCs)? Furthermore, are any cost differences also accompanied by care quality differentials as measured by hospitalizations or emergency department (ED) visits?

SUMMARY ANSWER: In 6,675 patients seen in either a CC or HC setting for their cancer care, total costs of care were lower per patient per month (PPPM) across all tumor types in the CC setting versus the HC setting (\$12,548 [standard deviation {SD}, \$10,507] ν \$20,060 [SD, \$16,555]; $P < .001$). The major driver of the cost differential was lower PPPM medical costs in the CC cohort (\$12,103 [SD, \$10,504] ν \$19,471 [SD, \$16,476]; $P < .001$). Rates of hospitalization 72 hours and 10 days after chemotherapy were similar for patients in both cohorts (CC ν HC at 72 hours: 2.3% ν 2.2% [$P = .6626$]; at 10 days: 7.0% ν 7.3% [$P = .6198$]). However, patients treated in the CC cohort had a 29% reduced risk of ED visits compared with the HC cohort (hazard ratio, 0.71; 95% CI, 0.54 to 0.95; $P = .02$).

WHAT WE DID: Cost data for patients with breast, lung, or colorectal cancer were extracted from the IMS LifeLink database. To control for clinical/demographic disparities between community and hospital patients, patients treated in the community setting were matched with those treated in a hospital-based clinic (2 to 1) on the basis of cancer type (breast

ν colon ν lung cancer), specific chemotherapy received, receipt of radiation, metastatic disease, sex, prior surgery, and geographic region. Chemotherapy-specific costs included the cost of chemotherapy plus costs incurred on the same day of administration. Pharmacy costs included all costs associated with dispensation of outpatient prescriptions under the patients' prescription drug plans. Costs were standardized to 2015 US dollars (\$) and analyzed PPPM. Hospitalizations, ED visits, physician visits, and other outpatient visits that occurred during follow-up were captured.

BIAS, CONFOUNDING FACTOR(S), DRAWBACKS: Although this analysis included a subset of patients age 65 years or older, it did not include evaluation of patients with Medicare or Medicaid as their sole payer. As such, results are not generalizable to these populations.

REAL-LIFE IMPLICATIONS: Treatment in the community practice is associated with lower total cost of treatment compared with hospital-based outpatient practices for patients with breast, lung, or colorectal cancer. An additional notable observation was the difference in ED visits after chemotherapy: those treated in the CC setting experienced fewer ED visits than those treated in the HC setting. These data provide real-world insight that calls for examination of reimbursement differentials across sites of care to ensure that access to high-quality cancer care is not diminished by limiting site of care options. **JOP**

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ASSOCIATED CONTENT

 Data Supplements available online

Abstract

Purpose

Access to high-quality cancer care remains a challenge for many patients. One such barrier is the increasing cost of treatment. With recent shifts in cancer care delivery from community-based to hospital-based clinics, we examined whether this shift could result in increased costs for patients with three common tumor types.

Methods

Cost data for 6,675 patients with breast, lung, and colorectal cancer were extracted from the IMS LifeLink database and analyzed as cost per patient per month (PPPM). Patients treated within a community setting were matched (2 to 1) with those treated at a hospital clinic on the basis of cancer type, chemotherapy regimen, receipt of radiation therapy, presence of metastatic disease, sex, prior surgery, and geographic region. Approximately 84% of patients were younger than 65 years of age.

Results

Mean total PPPM cost was significantly lower for patients treated in a community- versus hospital-based clinic (\$12,548 [standard deviation {SD}, \$10,507] v \$20,060 [SD, \$16,555]; $P < .001$). The PPPM chemotherapy cost was also significantly lower in the community setting (\$4,933 [SD, \$4,983] v \$8,443 [SD, \$10,391]; $P < .001$). The lower cost observed in community practice was irrespective of chemotherapy regimen and tumor type.

Conclusion

We observed significantly increased costs of care for our patient population treated at hospital-based clinics versus those treated at community-based clinics, largely driven by the increased cost of chemotherapy and provider visits in hospital-based clinics. If the site of cancer care delivery continues to shift toward hospital-based clinics, the increased health care spending for payers and patients should be better elucidated and addressed.

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INTRODUCTION

Access to affordable, high-quality cancer care is essential for optimal outcomes, yet it remains a great challenge for patients with cancer.^{1,2} Numerous factors may contribute to barriers for accessing high-quality cancer care, including uneven geographic distribution of oncology centers, health insurance, and increasing treatment costs.¹ Notably, annual cancer care costs are estimated to surpass \$170 billion by 2020.³

An emerging reason for geographic barriers and escalating costs is the shift of care delivery from community-based to hospital-based oncology practices. Since 2008, community-based practice clinic closures have increased 121%, and acquisition of community practices by hospitals has increased by 172%.⁴ This hospital acquisition of community-based practices has greatly increased the overall volume of hospital-based chemotherapy claims.^{5,6} This trend is particularly relevant to the cost of cancer care. Several analyses have cited a large cost differential between chemotherapy administered in community- and hospital-based outpatient clinics.⁶⁻⁸

Given this shift in site-of-care provision, we evaluated the cost differences of cancer care provided to patients with breast, lung, or colorectal cancer treated in a community-based or a hospital-based outpatient clinic to better elucidate the potential financial implications of this trend. A matched-cohort approach was used to control for potential confounding factors while costs were compared for clinically and demographically similar patients treated with the same chemotherapy regimens.

METHODS

Data Source

A 10% random sample of medical and pharmacy claims was obtained from the IMS LifeLink database (Data Supplement). The data source is fully compliant with the Health Insurance Portability and Accountability Act.

Sample Selection

Included patients had at least one medical chemotherapy claim with a diagnosis of breast, lung, or colorectal cancer between July 1, 2010, and June 30, 2015. Patients were grouped into a community-clinic cohort (ie, CC cohort) or hospital-based outpatient-clinic cohort (HC cohort) according to the place-of-service codes and billing category for chemotherapy; patients must have received all chemotherapy in either the CC or HC setting and had continuous eligibility for 6 months in the pre-index period through end of follow-up. Patients with

evidence of administration in both HC and CC settings were excluded. The first chemotherapy date was each patient's index date. Patients were observed for up to 1 year after the index date or until the first-line chemotherapy regimen was discontinued (defined as a 60-day period with no record of chemotherapy administration), whichever occurred first. All chemotherapy agents given within the 28-day post-index period were considered part of the first-line chemotherapy regimen. Regimens were categorized as branded plus generic agent(s), branded agent(s) only, and generic agent(s) only; the cost for each category was calculated separately from overall chemotherapy cost. Costs during first-line chemotherapy were defined as the amount paid for all services rendered during the patient's follow-up time. Total medical costs included all costs except those covered under pharmacy costs. Within total medical costs, chemotherapy-specific costs were defined as the cost paid for chemotherapy plus any costs incurred on the same day of chemotherapy administration. The cost of clinic-administered supportive care not given on the same day as chemotherapy administration was included in other outpatient costs. Pharmacy costs included all costs associated with dispensation of outpatient prescriptions under the patients' prescription drug plans; oral chemotherapy was included in the pharmacy costs. All costs were standardized to 2015 US dollars (\$) and analyzed as cost per patient per month (PPPM). Hospitalizations, emergency department (ED) visits, and physician and other outpatient visits (defined as visits related to laboratory/pathology work, radiology, or outpatient procedures [ie, surgical or diagnostic]) that occurred during follow-up were also captured. Chemotherapy-related ED visits and hospitalizations were defined as those that occurred within 72 hours and 10 days after chemotherapy to ensure that patients in both cohorts had equal opportunity to be evaluated by a provider within a defined timeframe before chemotherapy administration.

Statistical Analysis

To control for clinical and demographic disparities between cohorts, we matched patients treated in the community setting with those treated in a hospital-based clinic (2 to 1); patients were matched according to cancer type (breast *v* colon *v* lung cancer; matched patients had only one of these diagnoses throughout the study period), specific chemotherapy received, receipt of radiation therapy during follow-up, presence of metastatic disease (identified via diagnosis codes; Data

Supplement), sex, prior surgery, and geographic region. Charlson comorbidity index (CCI) scores were computed to assess comorbidities between the cohorts; CCI was similar across both cohorts and was not included in the match.⁹ Results were also stratified by age 65 years or older.

Categoric measures were presented as counts and percentages; means and standard deviations (SDs) were presented for continuous outcomes. The Wilcoxon signed rank sum test was conducted using SAS version 9.2 (SAS Institute; Cary, NC).

RESULTS

A total of 44,870 patients diagnosed and treated for breast, lung, or colorectal cancer were identified; of these, 7,467 patients met all inclusion criteria and 6,675 were matched 2 to 1 (community-based care [$n = 4,450$] ν hospital-based care [$n = 2,225$]) according to characteristics previously described (Fig 1). Patient and disease-related characteristics for matched patients are listed in Table 1; patient and chemotherapy characteristics were similar before and after matching, which indicated that patients included in the matched cohort were not notably different from those excluded in observable characteristics. The mean CCI score was 4.7 (SD, 2.3) in the CC cohort and was 4.8 (SD, 2.4) in the HC cohort. Overall, 4,494 patients (67%) had breast cancer (metastatic disease in 50%), 1,428 (21%) had lung cancer (metastatic disease in 67%), and 753 (11%) had colorectal cancer (metastatic disease in 67%). There were no differences in baseline demographics when patients were separated according to cancer type (Data Supplement). For the Medicare-eligible stratification, 780 patients (17.5%) were in the CC cohort (17.5%), and 318 patients (14.3%) were in HC cohort; patient- and disease-related characteristics were also similar within this subset.

Treatment Patterns

Of the 4,494 matched patients who received chemotherapy for breast cancer ($n = 2,996$ in CC cohort; $n = 1,498$ in HC cohort), the most common regimens were cyclophosphamide plus doxorubicin (34%, each cohort), cyclophosphamide plus docetaxel (21%, each cohort), and trastuzumab, a platinum agent, and docetaxel (11%, each cohort). Overall, 17% received radiation therapy during follow-up (16%, CC cohort; 17%, HC cohort). The majority of patients with breast cancer received generic chemotherapy only (73%, each cohort) followed by combinations of branded and generic chemotherapy (17%, each cohort) and branded chemotherapy only (10%, each cohort). The mean duration of chemotherapy in each cohort

was similar (CC cohort, 96.9 days [SD, 62.1 days], ν HC cohort, 94.4 days [SD, 58.5 days]).

Of the 1,428 patients who received chemotherapy for lung cancer ($n = 952$ in CC cohort; $n = 476$ in HC cohort), the most common regimens were a platinum agent plus either etoposide (28%, each cohort), paclitaxel (26%, each cohort), or pemetrexed (25%, each cohort), and 37% in each cohort received radiation therapy during follow-up. Overall, 63% in each cohort received generic chemotherapy only, 33% received combinations of branded and generic chemotherapy, and 3% received branded chemotherapy only. The mean duration of chemotherapy for lung cancer in each cohort was similar (CC cohort, 95.5 days [SD, 48.5 days], ν HC cohort, 89.4 days [SD, 44.5 days]).

Of the 753 patients who received chemotherapy for colorectal cancer ($n = 502$ in CC cohort; $n = 251$ in HC cohort), 61% received FOLFOX (oxaliplatin, fluorouracil, and leucovorin); this was combined with bevacizumab in 10% of patients in each cohort. Also, 19% in each cohort received single-agent fluorouracil, and 17% in each cohort received radiation therapy during follow-up. The majority of patients with colorectal cancer received generic chemotherapy only (67%, CC cohort; 74%, HC cohort) followed by branded chemotherapy only (17%, each cohort) and a combination of branded and generic chemotherapy (16%, CC cohort; 9%, HC cohort). The mean duration of chemotherapy in each cohort was similar (CC cohort, 123.7 days [SD, 69.5 days], ν HC cohort, 115.9 days [SD, 64.4 days]).

Cost of Care

Across all tumor types, the mean total cost (ie, medical plus pharmacy costs) PPPM during the post-index period was \$15,052 (SD, \$13,321). The mean total cost PPPM was significantly lower in patients treated in a community-based practice compared with those treated in a hospital-based outpatient practice (\$12,548 [SD, \$10,507] ν \$20,060 [SD, \$16,555]; $P < .001$). This trend was maintained for each individual tumor type; patients in the CC cohort had significantly lower costs than those in the HC cohort, as follows: breast cancer, \$11,599 (SD, \$8,129) ν \$19,279 (SD, \$14,358); lung cancer, \$17,566 (SD, \$17,436) ν \$26,980 (SD, \$25,386); colorectal cancer, \$12,368 (SD, \$10,312) ν \$19,346 (SD, \$17,542; $P < .001$ for all analyses; Table 2).

Overall, the major driver of the cost differential between the CC and HC cohorts was lower PPPM medical costs (\$12,103 [SD, \$10,504] ν \$19,471 [SD, \$16,476] in the CC cohort

Table 1. Patient and Disease-Related Characteristics in All Matched Patients

Characteristic	No. (%) of Patients (N = 6,675)	
	Community	Hospital Practice
Total patients	4,450 (67)	2,225 (33)
Female	3,606 (81)	1,803 (81)
Age, years, mean (SD)	56 (10)	54.9 (10)
Age group, years		
< 25	12 (0)	3 (0)
25-34	91 (2)	54 (2)
35-44	435 (10)	303 (14)
45-54	1,418 (32)	662 (30)
55-64	1,714 (39)	885 (40)
65-74	624 (14)	261 (12)
75-84	156 (4)	57 (3)
Geographic region		
East	898 (20)	627 (28)
Midwest	1,716 (39)	680 (31)
South	1,584 (36)	748 (34)
West	252 (6)	170 (8)
Presence of metastatic condition	2,468 (55)	1,234 (55)
Surgery during pre-index period	2,378 (53)	1,189 (53)
Radiation treatment during pre-index period	667 (15)	323 (15)
No switch of chemotherapy	4,450 (100)	2,225 (100)
Surgery during post-index period	140 (3)	59 (3)
Radiation treatment during post-index period	986 (22)	495 (22)
Required inpatient service	426 (10)	233 (10)
Required emergency department service	449 (10)	292 (13)
Mean (SD) Charlson comorbidity index	4.7 (2.3)	4.8 (2.4)
Mean (SD) unique drugs prescribed at baseline	4.4 (3.8)	4.3 (3.7)
Mean (SD) eligible days at baseline	180 (0)	180 (0)
Mean (SD) paid medical cost at baseline, \$	4,604.10 (4,406.00)	5,278.40 (4,868.80)
Mean (SD) allowed medical cost at baseline, \$	5,434.00 (4,803.80)	6,038.30 (5,126.80)
Mean (SD) duration of therapy, days	99.6 (61.0)	95.7 (57.0)
Mean (SD) total cycles of treatment	5.2 (4.2)	4.8 (4.4)

Abbreviation: SD, standard deviation.

compared with the HC cohort; $P < .001$), although the mean pharmacy PPPM costs were also slightly lower in the CC cohort than in the HC cohort (\$445 [SD, \$1,239] v \$589 [SD, \$1,934]; $P = .2708$). This trend in medical costs was consistent across tumor types and was driven by differentials in both

chemotherapy costs and physician visit costs between sites of care (Table 2; $P < .001$ for these analyses across tumor types).

Regarding the costs of chemotherapy specifically, the mean PPPM cost was significantly lower in the community setting (\$4,933 [SD, \$4,983] v \$8,443 [SD, \$10,391]; $P < .001$), and

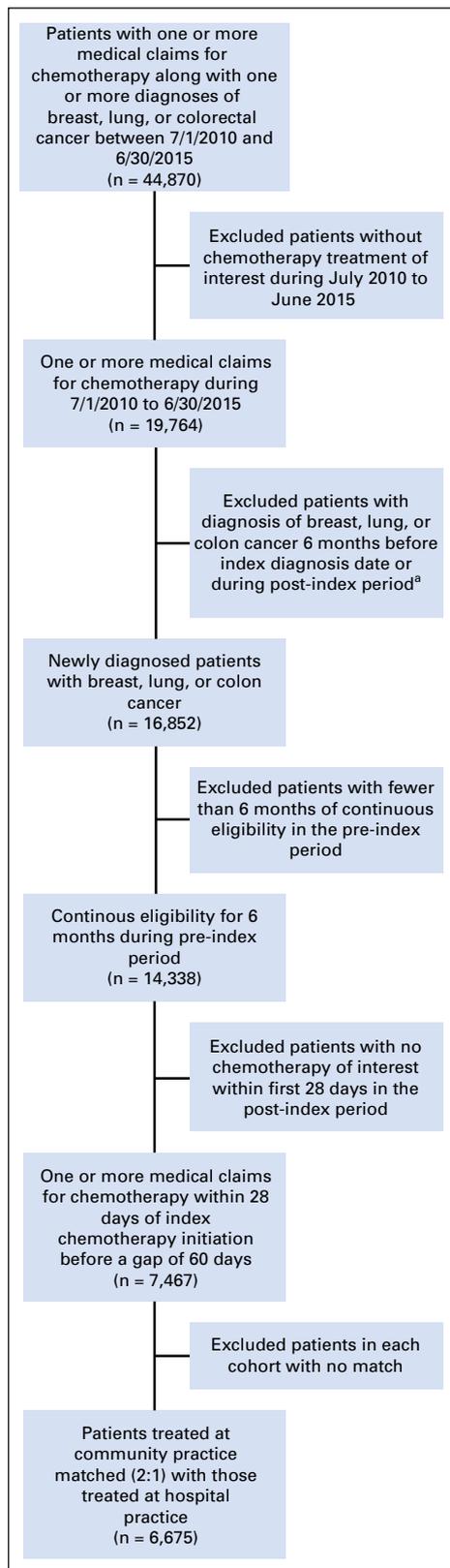


Fig 1. Patient attrition. (a) The index date is the date of the first chemotherapy administration.

patients were matched on type of chemotherapy received. The lower chemotherapy cost in the community practice setting was observed regardless of whether a brand, generic, or combination of brand and generic regimen was used (brand, \$6,674 [SD, \$5,046] ν \$10,900 [SD, \$10,712]; generic, \$2,936 [SD, \$2,585] ν \$5,134 [SD, \$6,306]; brand plus generic, \$11,080 [SD, \$5,889] ν \$19,412 [SD, \$13,869]).

Results for patients who were eligible for Medicare were similar to the overall analysis: the CC cohort had significantly lower costs than the HC cohort; the mean total PPM costs were \$9,414 (SD, \$13,171) in the CC cohort versus \$14,440 (SD, \$19,689) in the HC cohort ($P = .0012$). The cost differential observed in Medicare-eligible patients was, again, driven by lower PPM medical costs (\$9,078 [SD, \$13,757] ν \$14,036 [SD, \$19,721]; $P = .0024$).

Chemotherapy-Related Hospitalizations and ED Visits

Rates of hospitalization 72 hours and 10 days after chemotherapy across all patients were similar for patients treated in the community and hospital settings (CC ν HC cohort: 72 hours after chemotherapy, 2.3% ν 2.2% [$P = .6626$]; 10 days after chemotherapy, 7.0% ν 7.3% [$P = .6198$]). However, rates of ED visits within 72 hours and within 10 days of chemotherapy administration were significantly lower in the CC cohort versus the HC cohort (CC ν HC cohort: within 72 hours, 2.6% ν 3.6% [$P = .0055$]; within 10 days, 7.9% ν 9.8% [$P = .0022$]). This resulted in a risk reduction of 29% for ED visits for patients treated in the CC setting versus the HC setting (hazard ratio, 0.71; 95% CI, 0.54 to 0.95; $P = .02$). Furthermore, of the patients in the CC cohort who had at least one ED visit within 72 hours of chemotherapy administration ($n = 114$), a smaller proportion had multiple ED visits (ie, 2 or more) compared with patients who had at least one ED visit in the HC cohort ($n = 80$, HC; 7.9% ν 16.3%, CC ν HC). In addition to the lower rates of hospitalizations and ED visits in the CC versus HC cohort, patients in the CC cohort had a mean number of 4.4 outpatient physician visits per month (SD, 4.0 visits) compared with 5.0 visits per month (SD, 3.4 visits) for those in the HC cohort ($P < .001$); however, patients in the CC cohort had more other outpatient visits per month than those in the HC cohort (mean [SD], 4.5 [4.1] ν 3.7 [4]; $P < .001$).

DISCUSSION

This study suggests that the cost of cancer care for patients with breast, lung, or colorectal cancer treated in the CC setting is

Table 2. Mean PPM Medical Cost Components in All Matched Patients

Cost by patient group	Cost PPM (\$)				P
	Community Practice		Hospital-Based Practice		
	Mean	SD	Mean	SD	
All matched patients	n = 4,450		n = 2,225		
Mean total costs	12,548	10,507	20,060	16,555	< .001
Total medical costs	12,103	10,504	19,471	16,476	< .001
Chemotherapy	4,933	4,983	8,443	10,391	< .001
Branded agents only	6,674	5,046	10,900	10,712	< .001
Generic agents only	2,936	2,585	5,134	6,306	< .001
Combination regimen*	11,080	5,889	19,412	13,869	< .001
Physician visits	765	1,607	3,316	4,399	< .001
Radiation	1,095	4,153	1,430	4,904	< .001
Inpatient	1,178	6,229	1,498	7,193	.0095
ED visits	121	501	168	620	< .001
Outpatient	3,838	3,681	3,912	5,698	< .001
Other	174	2,405	704	3,353	< .001
Total pharmacy costs	445	1,239	589	1,934	.2708
Patients with breast cancer	n = 2,996		n = 1,498		
Mean total costs	11,599	8,129	19,279	14,358	< .001
Total medical costs	11,139	8,139	18,667	14,403	< .001
Chemotherapy	4,671	4,577	8,206	9,719	< .001
Branded agents only	5,608	4,273	9,279	7,805	< .001
Generic agents only	2,982	2,275	5,084	5,591	< .001
Combination regimen*	11,511	5,647	21,240	13,356	< .001
Physician visits	820	1,813	3,499	4,564	< .001
Radiation	378	1,305	440	1,493	.0561
Inpatient	735	4,230	874	3,804	.0415
ED visits	120	516	162	638	.0045
Outpatient	4,318	3,835	4,735	6,322	.2696
Other	97	718	752	3,461	< .001
Total pharmacy costs	461	1,361	612	1,699	.1084
Patients with lung cancer	n = 952		n = 476		
Mean total costs	17,566	17,436	26,980	25,386	< .001
Total medical costs	17,168	17,380	26,389	25,090	< .001
Chemotherapy	5,095	5,916	8,430	11,143	< .001
Branded agents only	7,969	4,967	7,881	5,974	.8408
Generic agents only	1,856	1,829	3,964	5,248	< .001
Combination regimen*	10,937	6,422	16,938	14,378	< .001
Physician visits	709	1,130	3,015	4,217	< .001
Radiation	3,255	7,845	4,343	8,798	< .001
Inpatient	2,767	10,612	3,413	12,982	.4836
ED visits	140	509	219	670	.0026
Outpatient	3,137	3,155	2,404	3,538	< .001
Other	133	947	506	2,120	< .001
Total pharmacy costs	398	950	591	2,828	.7058
Patients with colorectal cancer	n = 502		n = 251		
Mean total costs	12,368	10,312	19,346	17,542	< .001
Total medical costs	11,915	10,319	18,848	17,479	< .001

(continued on following page)

Table 2. Mean PPPM Medical Cost Components in All Matched Patients (continued)

Cost by patient group	Cost PPPM (\$)				P
	Community Practice		Hospital-Based Practice		
	Mean	SD	Mean	SD	
Chemotherapy	6,189	5,176	9,881	12,518	< .001
Branded agents only	9,862	6,041	17,603	16,676	< .001
Generic agents only	4,573	4,224	7,322	10,171	.0006
Combination regimen*	8,971	4,606	16,428	13,153	.2151
Physician visits	538	894	2,791	3,596	< .001
Radiation	1,274	3,770	1,820	5,597	.0119
Inpatient	802	4,212	1,593	6,637	.0207
ED visits	94	384	107	358	.1927
Outpatient	2,306	2,979	1,864	3,619	< .001
Other	711	6,799	790	4,431	.0019
Total pharmacy costs	454	1,081	498	1,109	.7512

Abbreviations: ED, emergency department; PPPM, per patient per month; SD, standard deviation.

*Combination chemotherapy regimen contained both branded and generic drugs.

significantly lower than for patients treated in the HC setting and that this difference is irrespective of treatment regimen, brand versus generic agents used, or tumor type. Overall, total mean PPPM costs were 59.9% higher in the HC setting than in the CC setting. This cost differential was driven largely by lower chemotherapy costs in community-based practices; this is despite the similarity in the number of cycles and the duration of therapy between the matched-cohort groups. This study supports previous findings, although the prior studies did not necessarily control for potential differences in patient or treatment characteristics. In a claims analysis of 283,502 patients who initiated treatment with infused chemotherapy, total reimbursement during the 6-month treatment episode was 48% lower when administered in physician offices rather than in hospital outpatient clinics (\$43,700 [95% CI, \$42,885 to \$44,517] v \$84,660 [95% CI, \$82,969 to \$86,352]; $P < .001$).⁶ Another claims analysis of patients with cancer who received intravenous chemotherapy indicated that costs were 46.0% higher in a hospital versus community setting (\$143,206 [SD, \$116,105] v \$98,071 [SD, \$69,236]; $P < .001$).⁷ Finally, a commercial claims database analysis demonstrated a 20% to 39% higher mean per member per month cost for patients treated at a hospital-based practice, irrespective of cancer type, geographic location, patient age, and number of chemotherapy sessions.⁸ In each study, the higher costs of cancer care in the hospital-based setting appear primarily driven by the increased cost of chemotherapy, not by disproportionate use of chemotherapy agents or chemotherapy sessions.¹⁰ This is, again, consistent with our finding that the duration of therapy,

overall and by cancer type, was similar within our two matched cohorts and therefore not contributory to the cost differential.

This analysis expands on previous work by matching patients with specific tumor types; treatments; and other possible confounders, such as the presence of metastatic disease, surgery, radiation, and geographic region. Furthermore, upon the request of a peer review, an additional analysis of the data by propensity score matching as well as an evaluation of median cost were performed. The results of the propensity versus direct match and median (interquartile range) versus mean (SD) are available side by side (Data Supplement); these results did not change any conclusions. Stratification to those who were Medicare-eligible patients also showed similar results, although we did not specifically evaluate those with only Medicare as the payer. We anticipate, however, that the cost differential for this patient population would still show lower costs in the CC versus HC setting, because the increased cost of chemotherapy in the HC setting was not the only driver of increased medical costs. However, because Medicare pays the same amount for chemotherapy regardless of site of care, and because chemotherapy cost was a large contributor of the cost differential, the relative rate of increased cost for this population within the HC versus CC cohort may be less pronounced.

This cost differential demonstrated here, which was based on site-of-care delivery, is concerning, because emerging data have revealed a downward shift in access to community-based oncology care sites.⁴ An earlier ASCO census report that focused on private community practices at risk noted that

smaller practices reported the greatest risk of closure.¹¹ The underlying etiology that drives integration of smaller practices with larger health care systems is multifactorial and includes issues such as lower chemotherapy reimbursement, increasing regulatory compliance and facility costs, and payer pressure.^{1,11} Smaller practices may be more willing to integrate into larger systems because of complex changes in payment design, health record requirements, and electronic data exchange.¹² A recent survey of community oncology practices cited reimbursement rates for both drugs (98%) and chemotherapy (90%), as well as the cost of regulatory compliance (87%), as very important or extremely important challenges that threaten their ongoing viability.⁴ As payers attempt to manage costs through narrowing networks, consolidation may be one way for both community- and hospital-based practices to increase their odds of being in network.¹²

Regardless, this shift in site of cancer care provision is concerning as emerging data demonstrate higher costs of care in hospital-based versus community-based practices. In fact, consolidation may be a contributing factor itself in the increasing cost of cancer care as larger health care systems, via their market power, can negotiate higher prices from payers, which could lead to higher prices for patients.¹²

A notable observation in our study was the difference in ED visits after chemotherapy administration, with rates of ED visits within 72 hours of 2.6% in the CC setting versus 3.6% in the HC setting ($P = .0055$); rates within 10 days were 7.9% in the CC setting and 9.8% in the HC setting. Also, a greater proportion of patients in the HC cohort had had multiple ED visits compared with patients in the CC cohort. This is particularly important, because a recent analysis of patients with advanced cancer concluded that 23% of ED visits were avoidable.¹³ In addition, patients in the CC cohort had an increased PPPM number of other (ie, nonphysician) outpatient visits, which perhaps reveals a difference in resource use geared toward patient management in lower-cost outpatient sites that results in a lower need for ED visits. This is also important as we look toward alternative payment models, such as the one endorsed by the Centers for Medicare and Medicaid Services (ie, the Oncology Care Model), which specifically lists ED visits as a required reporting measure for practices to qualify for any performance-based reimbursement.¹⁴

A limitation of this study is that, because the payer-type distribution within the data set is 80% commercial, we did not evaluate the cost differentials in the Medicare and Medicaid populations; therefore, results are not generalizable to these

populations. In addition, despite a robust matching for anticipated confounding factors, other potential confounders, such as socioeconomic data, were not available for any patient. Finally, certain aspects of routine oncology care today (ie, genetic testing/counseling, survivorship care) cannot be evaluated using this type of data.

In conclusion, this study indicates that treatment in the community practice is associated with lower total cost of treatment and cost of chemotherapy when compared with hospital-based outpatient practices for patients with breast, lung, or colorectal cancer. These data provide real-world insight to payers, providers, policy makers, and other health-system stakeholders to examine reimbursement differentials across sites of care, such that patient access to high-quality cancer care is not diminished by limiting site of care options as a result of financial pressures. Because the timeframe of this data predated the widespread use of more expensive therapies, such as immune-checkpoint inhibitors, and because the results lack generalizability to the aging Medicare population as well as the Medicaid population, future research is needed. **JOP**

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Authors' Disclosures of Potential Conflicts of Interest

Disclosures provided by the authors are available with this article at jop.ascopubs.org.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

Cost Differences Associated With Oncology Care Delivered in a Community Setting Versus a Hospital Setting: A Matched-Claims Analysis of Patients with Breast, Colorectal, and Lung Cancers

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