

Value Assessment of Oncology Pharmacist Interventions

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Authors' disclosures of conflicts of interest are found at the end of this article.

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<https://doi.org/10.6004/jadpro.2023.14.4.7>

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Abstract

A review of the published literature confirms the challenge in quantifying the value of oncology pharmacists. This editorial expands on a 2020 study by Meleis and colleagues published in the *Journal of the Advanced Practitioner in Oncology* and seeks to correlate pharmacist interventions to cost-saving and cost-avoidance measures to show the value of ambulatory oncology clinical pharmacists in patient care. A total of 4,686 interventions were reviewed. The 6-month intervention data demonstrate an annualized value of approximately \$1.1 million dollars from nine ambulatory oncology clinical pharmacists showcasing the essential role of the clinical pharmacist in ambulatory oncology settings.

In a 2020 study by Meleis and colleagues in the *Journal of the Advanced Practitioner in Oncology*, the authors report on the role and perceived impact of ambulatory oncology clinical pharmacists (AOCs). This article seeks to further investigate this data. The AOCs are integrated into the clinic setting with direct interaction with patients as well as the clinical team. The majority of these AOCs had a collaborative practice agreement with their providers, allowing for pharmacotherapy interventions, oral chemotherapy management, as well as treatment plan management. We focus on correlating pharmacist interventions to cost saving and cost avoidance, with a goal of demonstrating the value of AOCs in patient care.

METHODS

The authors evaluated 6 months of intervention data and correlated it to previously validated studies. These prior studies describe cost saving estimates per time taken to complete the intervention, as well as benefit-cost ratios (Calloway et al., 2013; Lee et al., 2002; Randolph et al., 2018; Schumock et al., 2003). Table 1 shows the intervention types, number, and time spent per activity that were evaluated for cost analysis.

OUTCOMES AND DISCUSSION

A total of 4,686 interventions were reviewed for this value assessment, with an average of 17.5 minutes spent per intervention when applicable.

Table 1. Interventions Evaluated for Cost Analysis

Intervention categories	N	Average time/ intervention
Treatment plan management	1,265	17.5 minutes
Patient education	1,085	17.5 minutes
Pharmacy administration	558	17.5 minutes
Oral chemotherapy management	529	17.5 minutes
Medication regimen/ Dosing change	377	17.5 minutes
Symptom management	292	NA
Drug information	231	17.5 minutes
Initiate drug	179	NA
ADE/Drug-drug interaction	170	NA

The values for cost avoidance for each type of intervention are shown in Table 2.

Each of our interventions was matched to a validated cost intervention from prior published studies. The average annual compensation package (including salary and benefits) of a specialty-trained pharmacist full-time equivalent (FTE) at

our institution is \$145,000, amounting to an hourly rate of \$69.71. Using these specified values of cost avoidance and benefit-cost ratios, the authors approximated the mean cost avoidance per intervention and mean time invested in the 6-month study period. These values were then extrapolated to an annualized cost avoidance. Subsequently, the authors deduced the annualized cost of pharmacist per amount of time invested per intervention. Using these two estimates, we were able to show the annualized net benefit of the AOCs from each of the studied interventions. These 6-month intervention data demonstrate an annualized value of approximately \$1.1 million dollars from nine AOCs, highlighting the essential role of the clinical pharmacist in ambulatory oncology settings. While the data have some limitations, including the retrospective nature of data collection, as well as approximated time of interventions, it can help substantiate the addition of AOC positions in the ambulatory practice setting.

In the limited studies that have endeavored to show the value of oncology pharmacists, there is

Table 2. Cost Avoidance Values by Type of Intervention

Intervention categories (matched study)	Value	Cost avoidance ^a (annualized)	Cost of pharmacist/time invested ^a (annualized)	Net benefit ^a (annualized)
Treatment plan management (Calloway et al., 2013)	\$3.75/min	\$166,035.00	\$51,360.16	\$114,674.84
Patient education (Randolph et al., 2018; Schumock et al., 2003)	5.73 benefit-cost	\$252,414.40	\$44,052.16	\$208,362.24
Pharmacy administration (Calloway et al., 2013)	\$3.75/min	\$73,237.50	\$22,654.80	\$50,582.70
Oral chemotherapy management (Calloway et al., 2013)	\$3.75/min	\$69,435.00	\$21,478.56	\$47,956.44
Medication regimen/dosing change (Calloway et al., 2013)	\$5/min	\$65,980.00	\$15,307.36	\$50,672.64
Symptom management (Lee et al., 2002)	\$536/ intervention	\$313,024.00	\$15,199.19	\$297,824.81
Drug information (Randolph et al., 2018; Schumock et al., 2003)	11.89 benefit-cost	\$111,512.94	\$9,379.76	\$102,133.18
Initiate drug (Lee et al., 2002)	\$536/ intervention	\$191,888.00	\$9,317.90	\$182,570.10
ADE/Drug-drug interaction (Lee et al., 2002)	\$317/ intervention	\$107,780.00	\$8,848.52	\$98,931.48

Note. ADE = adverse drug event.

^aAll annualized values are estimated.

a lack of standardization to illustrate a fiscal benefit. Prior studies have attempted to show benefit through various mechanisms, including prevention of adverse drug events, acceptance of pharmacist interventions, and reduction in prescribing errors. Our examination strives to derive a savings analysis based on validated cost avoidance and cost utilization of pharmacist compensation.

CONCLUSIONS AND FUTURE DIRECTIONS

From 2010 to 2020, the number of AOCF FTEs dedicated to ambulatory oncology at our National Cancer Institute–designated cancer center has increased exponentially. During this time, a new facility dedicated to ambulatory oncology opened, and the volume of cancer patient visits has skyrocketed. Future studies can measure value generated through billing for services in a prospective, matched cohort. Establishing standardized mechanisms to show the direct benefit of AOCFs continues to be explored. Oncology pharmacists remain synonymous with medication experts, and their role as an integral member of the multidisciplinary team should not be debated. ●

Disclosure

The authors have no conflicts of interest to disclose.

References

- Calloway, S., Akilo, H. A., & Bierman, K. W. (2013). Impact of a clinical decision support system on pharmacy clinical interventions, documentation efforts, and costs. *Hospital Pharmacy*, 48(9), 744–752. <https://doi.org/10.1310/hpj4809-744>
- Lee, A., Boro, M. S., Knapp, K. K., Meier, J., & Korman, N. (2002). Clinical and economic outcomes of pharmacist recommendations in a Veterans Affairs medical center. *American Journal of Health-System Pharmacy*, 59(21), 2070–2077. <https://doi.org/10.1093/ajhp/59.21.2070>
- Meleis, L. A., Patel, M. P., DeCoske, M., Moorman, M., Bush, P. W., & Barbour, S. (2020). Evaluation of the role and impact of ambulatory clinical pharmacists in an academic comprehensive cancer center. *Journal of the Advanced Practitioner in Oncology*, 11(8), 817–824. <https://doi.org/10.6004/jadpro.2020.11.8.2>
- Randolph, L. A., Walker, C. K., Nguyen, A. T., & Zachariah, S. R. (2018). Impact of pharmacist interventions on cost avoidance in an ambulatory cancer center. *Journal of Oncology Pharmacy Practice*, 24(1), 3–8. <https://doi.org/10.1177/1078155216671189>
- Schumock, G. T., Butler, M. G., Meek, P. D., Vermeulen, L. C., Bhakti Arondekar, & Bauman, J. L. (2003). Evidence of the economic benefit of clinical pharmacy services: 1996–2000. *Pharmacotherapy*, 23(1), 113–132. <https://doi.org/10.1592/phco.23.1.113.31910>