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ORIGINAL ARTICLE

Retrospective Outcomes of a New Acupuncture Service at a Comprehensive Cancer Center

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Abstract

Introduction: Among cancer centers, patients' interest in acupuncture is growing, in addition to clinical research in the intervention. Their National Cancer Institute-designated comprehensive cancer center piloted an acupuncture service. Their aim was to assess whether acupuncture impacted patient self-reported symptoms as delivered clinically and discuss their implementation strategy.

Methods: Patients undergoing acupuncture at a comprehensive cancer center from June 2019 to March 2020 were asked to complete a modified Edmonton Symptom Assessment Scale (ESAS) before and after each session. The authors evaluated symptom changes after acupuncture in both outpatient and inpatient settings. A change of ≥ 1 U, on the 0–10 scale, was considered clinically significant.

Results: Three hundred and nine outpatient and 394 inpatient acupuncture sessions were provided to patients at the comprehensive cancer center during this period, of which surveys from 186 outpatient (34 patients) and 124 inpatient (57 patients) sessions were available for analysis. The highest pretreatment symptoms reported by outpatients were neuropathy (5.78), pain (5.58), and tiredness (5.59). Outpatients receiving acupuncture reported clinically significant improvements in pain (ESAS score change of -2.97), neuropathy (-2.68), decreased lack of well-being (-2.60), tiredness (-1.85), nausea (-1.83), anxiety (-1.56), activities of daily living issues (-1.32), depression (-1.23), anorexia (-1.19), insomnia (-1.14), and shortness of breath (-1.14). The most severe pretreatment symptoms reported by inpatients were pain (6.90), insomnia (6.16), and constipation (5.44). Inpatients receiving acupuncture reported clinically significant improvements in anxiety (-3.69), nausea (-3.61), insomnia (-3.26), depression (-2.98), pain (-2.77), neuropathy (-2.68), anorexia (-2.20), constipation (-1.95), and diarrhea (-1.26).

Conclusion: Both outpatient and inpatient participants in this pilot acupuncture program reported clinically significant improvements in symptoms after a single acupuncture treatment. Some differences between the outpatient and inpatient settings warrant further investigation.

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Introduction

ACUPUNCTURE HAS BECOME a popular intervention among patients with cancer for both disease-related and treatment-induced symptom relief. Currently, acupuncture is one of the most commonly offered integrative services at National Cancer Institute (NCI)-designated cancer centers, seeing an increase from being offered at 58.6% of sites in 2009 to 73.3% in 2016.¹ Acupuncture is part of Traditional Chinese Medicine (TCM) that involves placement of fine needles in specific locations throughout the body to address symptoms.² Patients with cancer have been receptive to acupuncture, with one study demonstrating equal preference for acupuncture versus conventional medication among breast cancer survivors.³ There is also evidence that cancer survivors use integrative medicine therapies at higher rates than patients without cancer, with ~10.2% of cancer survivors in the United States having used acupuncture at some point, compared to the general population of 6.2%.⁴

Most studies on acupuncture in Western medical settings have focused on acupuncture use as an adjunct for symptom management. The strongest evidence from randomized controlled trials (RCTs) of acupuncture in oncology acupuncture is for the treatment of chemotherapy-induced nausea and vomiting.^{5,6} Strong evidence also suggests that acupuncture may be an adjunct therapy to improve pain control.^{7,8}

Accordingly, acupuncture is now included in national guidelines such as the Society for Integrative Oncology-American Society of Clinical Oncology guidelines for breast cancer treatment. In these guidelines, acupuncture is given a grade B recommendation for chemotherapy-induced nausea and vomiting and grade C recommendation for multiple other symptoms such as pain, anxiety, and depression.⁹ In the 2021 National Comprehensive Cancer Network guidelines, acupuncture is given a category 2A recommendation for chemotherapy-induced nausea/vomiting, as well as for cancer-related pain.^{10,11} Despite inclusion in these guidelines, there have been few articles presenting real-world data on the impact of acupuncture for symptom control among patients with cancer and even fewer articles presenting data from inpatient settings.^{12–15}

In addition, there are limited publications on implementation of an acupuncture program in a cancer center.^{16–18} The need for dissemination and implementation research was identified by Society for Acupuncture Research as one of the major objectives for advancing the field of oncology acupuncture.¹⁹ The authors present both real-world data on the immediate effects of acupuncture on patient-reported symptoms in cancer outpatients and inpatients and information regarding the implementation of their program.

Methods

Study design

This study was approved by the UH Cleveland Medical Center Institutional Review Board as a retrospective cohort study with a waiver of informed consent. Symptom data

from each visit were collected on paper survey forms by the acupuncturist and then documented in the electronic health record by the acupuncturist as part of routine care for patients utilizing the acupuncture service. Basic demographic and medical data were extracted from patients' medical records.

Setting

An acupuncture service was piloted at their freestanding comprehensive cancer center in January 2019 with one acupuncturist credentialed within the hospital system. Acupuncture was initially offered exclusively as an inpatient service, at no additional cost for the patient. In June 2019, outpatient acupuncture services were initiated using the same set of eligibility and safety criteria as the inpatient setting.

Patients hospitalized at the cancer center who were interested in acupuncture could be referred with an indication of pain, nausea, xerostomia, hot flashes, fatigue, neuropathy, or headache. Services were provided at the patient's hospital bedside or in outpatient medical oncology clinics. Initial acupuncture visits were 60-min, with established visits lasting 30-min. All acupuncture treatments were provided on-site by a single acupuncturist (T.N.) with a Diplomate of Oriental Medicine, certified by the National Certification Commission for Acupuncture and Oriental Medicine and with over 13 years of experience of providing acupuncture.

Complete blood count (and international normalized ratio [INR] if patient was on anticoagulant treatment) was also checked in selected patients as part of the eligibility and safety criteria before receiving acupuncture. Patients with an absolute neutrophil count (ANC) of <500, platelet count below 20, or INR (obtained if patient was receiving warfarin) of greater than 5 were ineligible for acupuncture. For patients with ANC between 500 and 1000, platelet count of 20–50, or INR of 1.5–5.0, acupuncture was modified to be more shallow, with acupuncture needles inserted <1 cm into the skin.

Treatment plans were selected based on general principals of TCM and individualized by the acupuncturist based on the patient's diagnosis and prior health history. An individualized treatment was utilized with acupuncture needles left in place for ~20–30 min. Electrical stimulation to the needles was added based on the patient's symptoms and preferences. The service was operational from June 2019 to March 2020, at which time the service was halted due to the COVID-19 pandemic.

Participants

Patients at their comprehensive cancer center include individuals with primary diagnosis of cancer, as well as those with sickle cell anemia. All patients who received acupuncture from their service were invited to complete survey used for this study, although not all patients elected to take both the pre- and post-surveys. In the data that were included in the analysis, only >50% of each pre- and post-treatment Edmonton Symptom Assessment Scale (ESAS) survey were completed.

Data measurement

Patients were invited to fill out a modified ESAS before and immediately after acupuncture.²⁰ Symptoms are rated on a scale from 0 to 10 with 0 signifying no symptoms and 10 signifying “worst possible.” Paper forms containing the modified ESAS surveys were provided to outpatient and inpatient populations and transferred into a database after the session. The core symptoms included in both settings were anorexia, neuropathy, anxiety, depression, diarrhea, constipation, nausea, insomnia, and pain. The outpatient survey also included six additional well-being, activities of daily living (ADLs), tiredness, social well-being, shortness of breath (SOB), and spiritual well-being. More time was available in the outpatient setting for the longer survey. A change of ≥ 1 U on the ESAS demonstrates a clinically significant change.²¹

Statistical methods

Data are presented in aggregate as many cancer centers will treat both malignant and nonmalignant hematologic conditions (i.e., sickle cell disease). Surveys containing missing responses were excluded in analysis for the specific symptom score that was missing data. Symptom pairs in which patients answered 0 on both the initial preacupuncture survey and the postacupuncture survey were also excluded from analysis as this demonstrated that the symptom was not present in that patient. Basic descriptive statistics was used to analyze patient characteristics and pretreatment ESAS mean scores for all patients who reported a nonzero pretreatment score. Paired *t* tests and mixed ANOVA were conducted in RStudio (version 1.4.1106) and IBM SPSS Statistics (Version 26.0). *p*-Values for difference in pre- and post-treatment scores were derived from paired *t* tests. For subgroup analysis, ESAS symptoms with scores of 1 to 3 were viewed as “mild,” 4 to 6 were viewed as “moderate,” and 7 to 10 were viewed as “severe.”

Results

Patient characteristics

A total of 703 acupuncture sessions (309 outpatient and 394 inpatient) were provided to patients at the comprehensive cancer center from June 2019 to March 2020. Not all patients receiving acupuncture chose to fill out the surveys. In total, 310 survey sets (44%) had greater than 50% filled out and were analyzed. This includes 186 outpatient acupuncture sessions from 34 unique individuals and 124 inpatient acupuncture sessions from 57 unique individuals (Table 1). Outpatients had a mean age of 60 (range 21–87), while the mean age of the inpatient population was 45 (range 29–80). Of the patients with cancer ($n = 58$), the mean age in the outpatient population was 62 (range 21–87), while the mean age in the inpatient population was 56 (range 29–80). Over half of all sessions were for female patients (59% outpatient and 62% inpatient).

In the outpatient setting, the most common primary diagnosis was hematologic malignancy (30%), breast cancer (27%), and gastrointestinal cancer (20%). In the inpatient setting, these were (in order of prevalence) sickle cell disease (36%), gastrointestinal cancers (24%), and hematologic malignancy (20%). Approximately half (53%) of patients

receiving outpatient acupuncture had received chemotherapy within the past 3 months. Cancer treatments, including hormone therapy (17%), radiation (3%), and surgery (3%), were less common within this timeframe. Approximately half (57%) of the patients with cancer receiving inpatient acupuncture had received chemotherapy within the past 3 months; 18% had received surgery; and 18% received radiation therapy.

For the outpatient population, patients attended an average of 5.5 sessions (range 1–12), and for the inpatient population, patients attended an average of 2.2 sessions (range 1–11). Their cancer center treatment covers both patients with primary diagnosis and cancer and those with nonmalignant hematologic conditions. When examining only patients with a primary diagnosis of cancer, patients receiving outpatient acupuncture attended an average of 5.7 sessions with 83.3% attending more than one session. For patients with cancer in the hospital, they received an average of 2.3 acupuncture sessions with 50% receiving more than one session.

Outpatient versus inpatient acupuncture

Significant variances in nonzero pretreatment scores, describing that the symptom was present for the patient, were observed for neuropathy: outpatient 70.2% versus inpatient 22.8% (Table 2). Otherwise, patients reported similar pretreatment symptom prevalence in outpatient and inpatient populations (pain 92.0% vs. 87.1%, nausea 37.1% vs. 33.1%, anorexia 43.1% vs. 36.2%, anxiety 54.5% vs. 66.1%, insomnia 61.7% vs. 70.7%, depression 44.4% vs. 58.9%, diarrhea 20.9% vs. 29.0%, and constipation 39.4% vs. 50.6%), respectively. Six additional symptoms were assessed in outpatient acupuncture sessions. Incidence of these symptoms were: issues with general well-being (92.0%), tiredness (88.2%), SOB (44.0%), decreased ADLs (35.1%), decreased social well-being (29.1%), and decreased spiritual well-being (24.1%).

At baseline pretreatment ESAS symptoms with the highest reported severity in the outpatient setting were neuropathy (5.78), pain (5.58), and tiredness (5.59). Multiple patient-reported symptom scores in the outpatient clinic setting demonstrated a clinically significant (as defined by a change of ≥ 1) and statistically significant ($p < 0.05$) difference after a single acupuncture treatment (Fig. 1). Patients reported clinically significant mean improvements in almost all symptoms surveyed, including pain (ESAS score change of -2.97), neuropathy (-2.68), decreased general well-being (-2.60), nausea (-1.83), anxiety (-1.56), insomnia (-1.14), depression (-1.23), anorexia (-1.19), tiredness (-1.85), issues with ADLs (-1.32), and SOB (-1.14) (Table 3).

Among inpatients, all symptoms surveyed demonstrated clinically and statistically significant changes after a single treatment. Pretreatment symptoms with the highest reported severity were pain (6.90), insomnia (6.16), and constipation (5.44). The symptoms with the largest degrees of improvement, which all demonstrated improvement of greater than 3 points, were anxiety (-3.69), nausea (-3.61), and insomnia (-3.26). Multiple inpatient documents reported patients falling asleep in response to acupuncture. Other symptoms demonstrating clinically significant improvements included: depression (-2.98), pain (-2.77), neuropathy (-2.68),

TABLE 1. PATIENT CHARACTERISTICS

<i>Characteristic</i>	<i>Outpatient (all)</i>	<i>Outpatient (cancer)</i>	<i>Inpatient (all)</i>	<i>Inpatient (cancer)</i>	<i>Inpatient (nonmalignant)</i>
No. of unique patients	34	30	58	28	29
Average No. of treatments	5.7	5.5	2.17	2.25	2.10
Age average (range)	60 (21–87)	62 (21–87)	45 (29–80)	56 (29–80)	35 (24–63)
Age in years	<i>N</i> (%total)	<i>N</i> (%total)	<i>N</i> (%total)	<i>N</i> (%total)	<i>N</i> (%total)
<30	1 (3%)	1 (3%)	9 (16%)	1 (4%)	7 (24%)
31–60	14 (46%)	10 (33%)	37 (64%)	16 (57%)	21 (72%)
>61	19 (56%)	19 (63%)	12 (21%)	11 (39%)	1 (3%)
Gender					
Female	20 (59%)	18 (60%)	36 (62%)	17 (61%)	18 (62%)
Male	14 (41%)	12 (40%)	22 (38%)	11 (39%)	11 (38%)
Race					
White	22 (65%)	22 (73%)	20 (35%)	20 (71%)	—
Black	12 (35%)	8 (27%)	37 (64%)	7 (25%)	29 (100%)
Other	—	—	1 (2%)	1 (4%)	—
Insurance					
Medicare	20 (59%)	19 (63%)	18 (31%)	8 (29%)	10 (34%)
Medicaid	5 (15%)	3 (10%)	22 (38%)	5 (18%)	16 (55%)
Private	9 (26%)	8 (27%)	17 (29%)	15 (54%)	2 (7%)
Uninsured	—	—	1 (2%)	—	1 (3%)
Cancer type					
Hematologic		9 (30%)		6 (20%)	
Breast		8 (27%)		2 (7%)	
GI		6 (20%)		7 (24%)	
Head/neck		4 (13%)		—	
GU		1		3 (10%)	
Lung		1 (%)		4 (14%)	
Other		1 (%)		6 (21%)	
Stage					
Stage I–II		4 (13%)		5 (18%)	
Stage III–IV		17 (57%)		16 (57%)	
Unknown		9 (30%)		7 (25%)	
Recent treatments (within 3 months of acupuncture session)					
Hormone		5 (17%)		1 (4%)	
Chemotherapy		16 (53%)		16 (57%)	
Radiation		1 (3%)		5 (18%)	
Surgery		1 (3%)		5 (18%)	

GI, gastrointestinal; GU, genitourinary.

anorexia (−2.20), constipation (−1.95), and diarrhea (−1.26). There were no major differences between the combined inpatient population when analyzing only patients with a primary diagnosis of cancer.

In comparing ESAS changes reported by patients with cancer with that of the combined data, all symptom categories remained clinically significant, with the exception of diarrhea which was no longer statistically significant. Differences in ESAS score improvements between hospitalized patients with nonmalignant hematologic conditions (e.g., sickle cell disease) and patients with cancer were not statistically significant for pain, anorexia, nausea, depression, anxiety, insomnia, constipation, and neuropathy.

Additional subgroup analysis was conducted on the combined patient populations. There was no statistically significant difference in ESAS symptom score changes for patients who received ≥5 versus <4 acupuncture treatments. When patients were stratified by their pretreatment ESAS symptom scores (i.e., mild [1–3], moderate [4–6], or severe [7–10]), there was a statistically significant difference in the

percent change from the pretreatment score for some but not all symptoms. Specifically, patients reporting a higher pretreatment severity also reported a greater percent decrease after a single session of acupuncture. In the outpatient setting, this result was seen for pain, neuropathy, nausea, anxiety, well-being, tiredness, and SOB (all $p < 0.001$). In the inpatient setting, this trend was seen for nausea, anxiety, depression, anorexia, and diarrhea (all $p < 0.001$). For the patients who reported a pretreatment ESAS score of 0 for a symptom, none reported worsening from 0 on the post-treatment survey.

Safety: One adverse event was the retention of a needle during an inpatient treatment, but this did not lead to any clinical events.

Discussion

The use of acupuncture in conventional cancer care settings has gradually increased over the past decade and is available at the majority of cancer centers.²² However, there

TABLE 2. PATIENT REPORTED EDMONTON SYMPTOM ASSESSMENT SCALE SCORE >0

	Outpatient %ESAS score >0	Inpatient %ESAS score >0
Pain	87.1%	92.0%
Neuropathy	70.2%	22.8%
Nausea	33.1%	37.1%
Anxiety	66.1%	54.5%
Insomnia	70.7%	61.7%
Depression	58.9%	44.4%
Anorexia	36.2%	43.1%
Diarrhea	29.0%	20.9%
Constipation	50.6%	39.4%
Well-being	92.0%	
Tiredness	88.2%	
ADLs	35.1%	
SOB	44.0%	
Social Well-being	29.1%	
Spiritual well-being	24.1%	

ADLs, activities of daily living; SOB, shortness of breath; ESAS, Edmonton Symptom Assessment Scale.

are very few articles discussing the implementation of acupuncture programs within cancer centers for both inpatient and outpatient populations. The information presented here would be important for cancer centers wanting to establish an acupuncture program.

An integral part of their pilot program was the use of a sliding scale payment model, as prior work has suggested that many interested patients were unable to access acupuncture due to cost.²³ While there is a net loss in terms of profit in both outpatient and inpatient settings, acupuncture's

clinically significant impact on symptoms may contribute to greater patient satisfaction and/or decreased hospital stays. There is evidence that inpatient integrative pain management approaches may reduce hospital course by half a day, and this is associated with cost savings of ~\$900 per hospital admission.²⁴ While their enrollment numbers are not large enough to conduct this analysis, it is possible that a similar effect may be observed among patients receiving acupuncture at a comprehensive cancer center.

Symptoms demonstrating greatest improvement after a single session of acupuncture were pain in the outpatient setting and nausea in the inpatient setting. These findings are similar to data presented from RCTs on acupuncture use for pain and nausea/vomiting management in cancer.^{5,8,25} In particular, acupuncture is established as part of the National Comprehensive Cancer Network recommendations for pain management in cancer settings.^{10,11} Interestingly, patients also reported improvement in many symptoms that would not be expected to improve acutely immediately after acupuncture, such as diarrhea and constipation. However, the changes in these symptom categories were more modest.

In practice, the authors noted that many patients referred to acupuncture never went on to receive acupuncture treatment. Anecdotally, patients reported cost as a barrier to access. Because of this concern, two surveys of patients were conducted at their institution that identified cost as a major barrier for patients to receive acupuncture.^{23,26} Due to these findings, the authors established a sliding scale as <10% of patients were willing to pay \$80 or more for an acupuncture treatment. Charges to the patient were determined based on their income bracket, with assistance of their financial counseling office (see online Fig. 2 for an overview of this workflow). Patients with incomes of

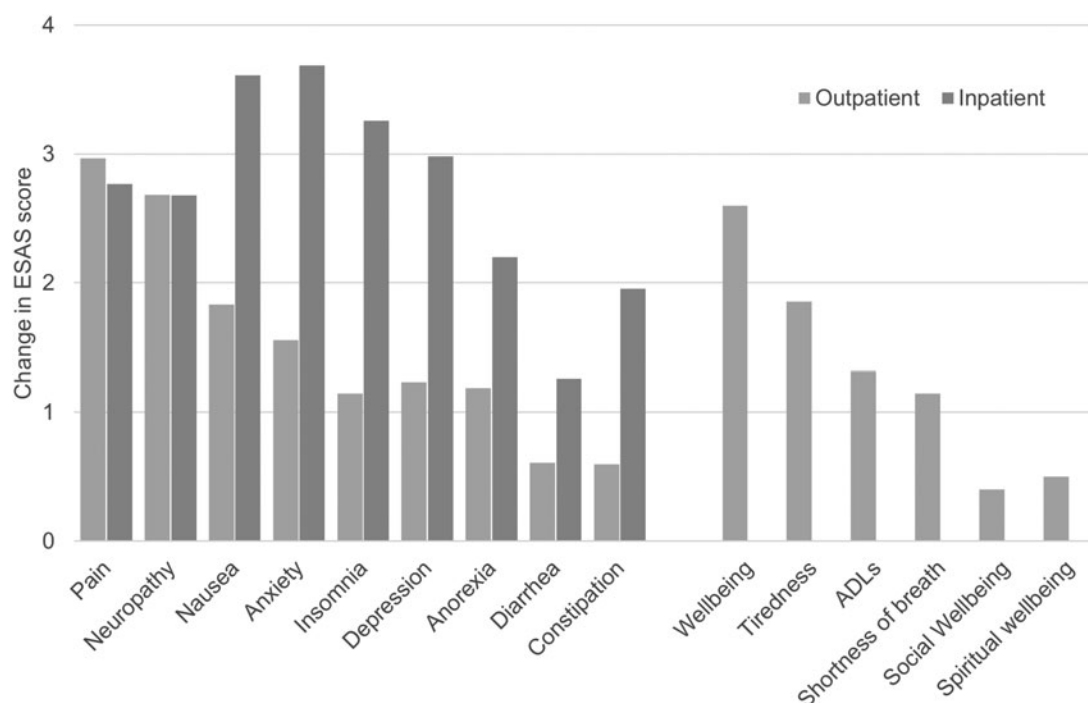


FIG. 1. Degree of ESAS score change from patients who received inpatient or outpatient acupuncture. Additional symptoms asked about in outpatient setting only are shown on the right. ADLs, activities of daily living; ESAS, Edmonton Symptom Assessment Scale.

TABLE 3. PATIENT REPORTED EDMONTON SYMPTOM ASSESSMENT SCALE DATA FROM OUTPATIENT AND INPATIENT POPULATIONS

	<i>Outpatient</i>					<i>Inpatient</i>				
	<i>Before</i>	<i>After</i>	<i>Change</i>	<i>%Change</i>	<i>p</i>	<i>Before</i>	<i>After</i>	<i>Change</i>	<i>%Change</i>	<i>p</i>
Pain	5.58	2.62	-2.97	-53.2%	<0.001	6.90	4.13	-2.77	40.1%	<0.001
Neuropathy	5.73	3.04	-2.68	-46.8%	<0.001	4.96	2.29	-2.68	54.0%	<0.001
Nausea	3.80	1.97	-1.83	-48.2%	<0.001	4.09	0.48	-3.61	88.3%	<0.001
Anxiety	3.83	2.28	-1.56	-40.7%	<0.001	5.33	1.64	-3.69	69.2%	<0.001
Insomnia	4.63	3.49	-1.14	-24.6%	<0.001	6.16	2.91	-3.26	52.9%	<0.001
Depression	3.66	2.43	-1.23	-33.6%	<0.001	4.67	1.69	-2.98	63.8%	<0.001
Anorexia	4.44	3.25	-1.19	-26.8%	<0.001	5.06	2.86	-2.20	43.5%	<0.001
Diarrhea	3.84	3.24	-0.61	-15.9%	<0.001	4.17	2.91	-1.26	30.2%	0.01
Constipation	4.52	3.92	-0.60	-13.3%	<0.001	5.44	3.49	-1.95	35.9%	<0.001
Well-being	5.07	2.48	-2.60	-51.3%	<0.001					
Tiredness	5.59	3.74	-1.85	-33.1%	<0.001					
ADLs	3.88	2.57	-1.32	-34.0%	<0.001					
SOB	3.66	2.51	-1.14	-31.1%	<0.001					
Social well-being	3.42	3.02	-0.40	-11.7%	<0.001					
Spiritual well-being	3.50	3.00	-0.50	-14.3%	0.015					

ADLs, activities of daily living; SOB, shortness of breath.

<2.5×the federal poverty level (FPL) would qualify for no out of pocket fee. Patients with incomes of 2.5–4×FPL would be charged \$10 per 30-min procedure. Patients with incomes >4×FPL would be charged \$25 per 30-min procedure. Almost all patients (97%) qualified for acupuncture at a reduced cost or free. This pilot program showed that 46% of patients qualified for free acupuncture and another 51% qualified for acupuncture at a reduced cost. Indeed, this cancer center is located in a socioeconomically disadvantaged neighborhood which may have explained the low utilization of acupuncture before this pilot program.²⁷ Cancer centers should be mindful of patients' socioeconomic status when considering a business case for acupuncture with special attention to the fee structure.

The primary cost for establishing the program was ~\$120,000 per year for salary and staff benefits. Other costs that were not assessed included the administrative support to schedule these appointments, as well as the cost of the outpatient clinic rooms. For this pilot, these rooms were not being utilized for other purposes. For the period June 2019 to March 2020, a total of 309 outpatient acupuncture treatments were completed. Out of these, 141 treatments (established or initial) were provided at no charge, 158 established visits were provided at \$25 per session, and 10 initial visits were provided at \$50 per session. In total, \$4,450 in revenue was generated by the program in 9 months (Table 4). From an administration perspective, their acupuncture program was intended to be a value-added service, and thus, cost recovery was not anticipated due to the implementation of a sliding scale payment model.

Compared to previous studies in oncology acupuncture, this study also examined the impact of single-session acupuncture treatments. The observed improvements in patient-reported symptoms are similar to previously published real-world data, which report improvement in most ESAS symptom categories.^{12,13,15} Reports from MD Anderson Cancer Center demonstrated that patients experienced both short- and long-term improvements in multiple symptoms, including hot flashes, fatigue, numbness/tingling,

and nausea, when acupuncture was used in the outpatient setting,¹³ and similar improvements for pain, nausea, anxiety, drowsiness, and fatigue in the inpatient setting.¹²

The survey data presented here also suggest that there may be immediate, acute benefits of a single acupuncture session on patient's self-reported symptoms in cancer care settings. This is consistent with research published in emergency medicine suggesting that single session acupuncture may be comparable to pharmacotherapy for acute pain management.^{28,29} This study also included sickle cell disease patients, in which many cancers also provide patient care. Their study indicates that these patients may also benefit from acupuncture and is consistent with other preliminary studies.^{30–33} Future research is needed to determine if the findings presented here hold true for other cancer and sickle cell disease populations and if such immediate effects do exist, for how long these patient self-reported improvements persist.

A major limitation of their study is that it was a small study focused on a single freestanding cancer center, thus limiting generalizability for other cancer centers. Due to COVID-19 in combination with personnel changes, the program was halted prematurely. As this is a retrospective analysis of data originally gathered for internal purposes, there is no comparison group. It was commonly noted in patient notes that patients receiving acupuncture would fall asleep, which may have influenced symptoms such as tiredness, insomnia among others.

In conclusion, the authors demonstrate the implementation of a pilot acupuncture program within a NCI-designated comprehensive cancer center that included both inpatient and outpatient services. This service led to significant clinical improvement in symptoms that differed in each setting. In addition, multiple different approaches toward oncology acupuncture exist, such as group acupuncture,³⁴ that were not utilized in their program. There may not be a "one-size fit all" model for establishing acupuncture programs, and so cancer centers need to tailor services to patients' needs and preferences. Additional dissemination of program

FIG. 2. Work flow of pilot acupuncture program.

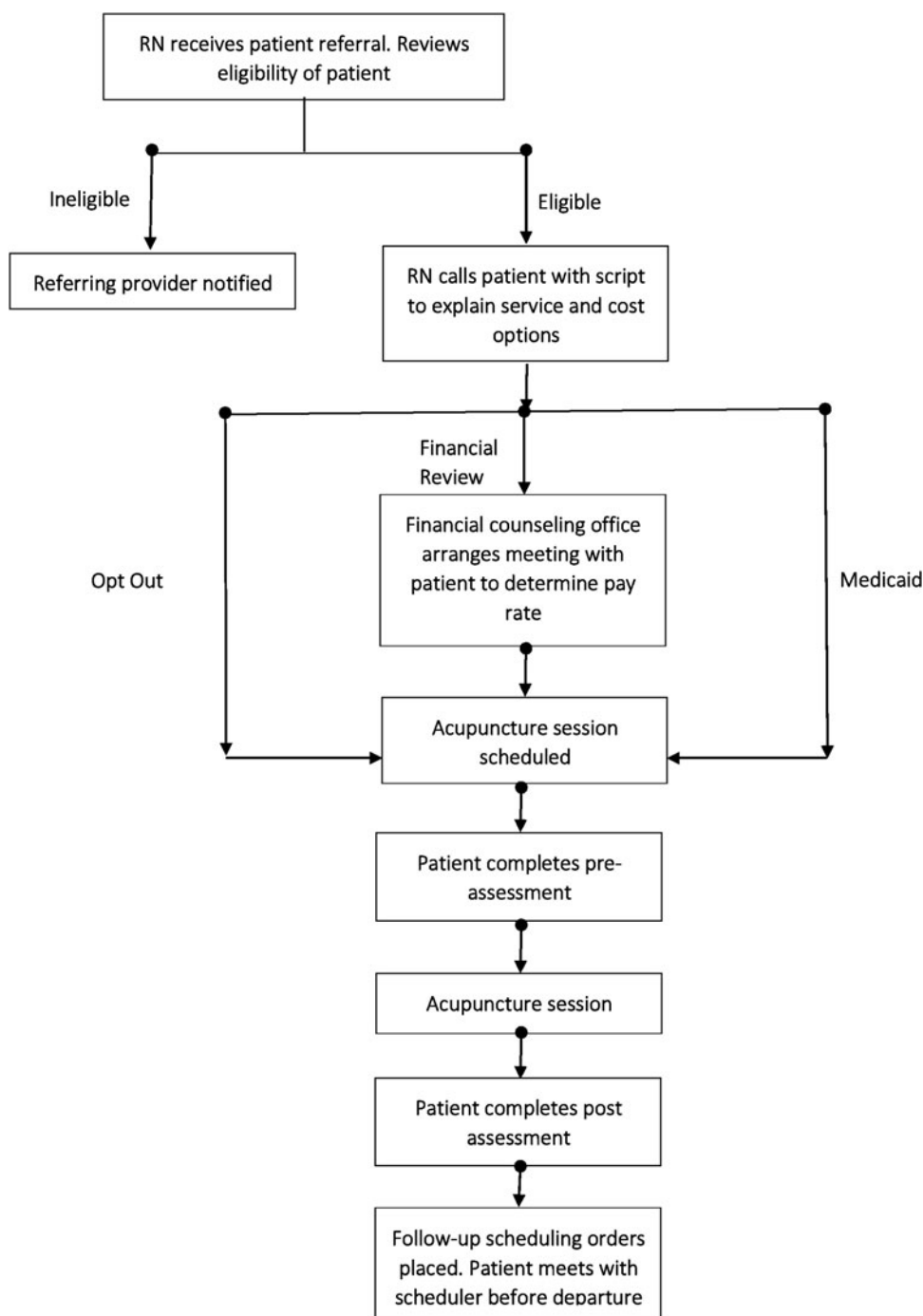


TABLE 4. REVENUE AND COST OF ACUPUNCTURE SERVICE (JUNE 2019–MARCH 2020)

<i>Payment</i>	<i>No. of sessions</i>	<i>Revenue</i>
\$0	141	—
\$25	158	\$3,950
\$50	10	\$500
Total revenue		\$4,450
Total cost		\$120,000

implementation will likely be needed in the future to allow for the continued development and growth of oncology acupuncture programs.

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Authors' Contributions

Y.S.: formal analysis, writing—original draft, and writing—review and editing; T.N.: conceptualization,

investigation, and writing—review and editing; M.F.: formal analysis and writing—review and editing; S.R.-M.: formal analysis and writing—review and editing; G.M.: writing—review and editing; C.K.: writing—review and editing; J.A.D.: writing—review and editing; P.M.: writing—review and editing; F.A.: writing—review and editing; R.T.L.: conceptualization, formal analysis, funding acquisition, investigation, methodology, project administration, resources, supervision, writing—original draft, and writing—review and editing.

Author Disclosure Statement

No competing financial interests exist.

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