

ORIGINAL RESEARCH

Integrative Oncology Models of Care: Practice Patterns From NCCN Member Institutions

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

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Abstract

Background: Patients with cancer frequently desire to incorporate integrative oncology (IO) practices into their care. However, patients are often uncertain about how to best access safe and effective IO practices and providers. The National Comprehensive Cancer Network (NCCN) Best Practices Committee (BPC), in collaboration with a National Cancer Institute (NCI)-Designated Comprehensive Cancer Center, sought information regarding IO practices of NCCN Member Institutions. **Methods:** The BPC conducted a survey of NCCN Member Institution IO practices, which was distributed via a web-based survey tool to a representative at each center. Results were compiled using descriptive statistics.

Results: Twenty-nine centers responded to the survey, with 100% of the responding institutions offering IO services. Services provided included nutritional/dietary services (97%), stress and anxiety management services (76%), mind-body practices (72%), physical therapy/occupational therapy (72%), acupressure/acupuncture (69%), and massage therapy (59%). While the mechanism for patient access varied, the most common was provider referral with some services available by self-scheduling. Twenty-one percent of centers used institutionally designed algorithms for referrals. Significant variation in funding for services existed between institutions, including combinations of self-pay, insurance-based, and philanthropically funded models. **Conclusions:** There was substantial variation in how NCCN Member Institutions deliver IO services. These results provide guidance for health-care organizations seeking to develop IO services and an opportunity to align best practices. As data were compiled solely from sites providing comprehensive cancer services, non-academic community settings may find similar implementation challenging. However, this information provides cancer providers insight into IO services most often sought by patients with cancer.

Over 77% of patients with cancer report using complementary and alternative medicine practices in addition to conventional medical treatments (Hutten et al., 2023). Integrative oncology (IO) is an oncology subspecialty that combines conventional medical treatments, including chemotherapy, radiation, and surgery, with evidence-based complementary and integrative health modalities, prioritizing safety and efficacy (Greenlee et al., 2017; Latte-Naor & Mao, 2019; National Cancer Institute, 2024; Witt et al., 2017). Patients with cancer frequently incorporate integrative therapies to manage symptoms, treat cancer, or for mental health purposes (Hutten et al., 2023).

The use of integrative therapies, such as meditation, yoga, massage, and music therapy, acupressure, and acupuncture has been shown to improve symptoms, physical functioning, and quality of life for patients with cancer (Bower et al., 2024; Carlson et al., 2023; Greenlee et al., 2017; Mao et al., 2022). The National Comprehensive Cancer Network (NCCN) is a not-for-profit alliance of leading cancer centers dedicated to improving and facilitating quality, effective, equitable, and accessible cancer care so all patients can live better lives. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) and the American Society of Clinical Oncology (ASCO) both recommend providers consider integrative therapies, especially in vulnerable populations where conventional treatments may not be tolerated (National Comprehensive Cancer Network, 2024; Paice et al., 2016). However, most integrative oncology therapy services are not reimbursable by insurance, or plans provide partial coverage, leading to various methods and models when implementing institution-based IO programs (Greenlee et al., 2017; Nahin et al., 2016).

The NCCN develops resources in collaboration with leaders and clinical experts from NCCN Member Institutions that provide valuable information to numerous stakeholders and are used worldwide. The NCCN Best Practices Committee (BPC) is comprised of clinical and administrative leaders from each of these centers collaborating to improve operational effectiveness and efficiency at NCCN Member Institutions. Topics of interest

and importance to centers are selected by the BPC and explored through surveys, workgroups, webinars, and meetings.

METHODS

As a member of NCCN, a National Cancer Institute (NCI)-Designated Comprehensive Cancer Center sought detailed information regarding IO models of care from other NCCN Member Institutions to identify current IO program structures and describe the process for care delivery among patients with cancer to further develop their integrative oncology program.

Best Practices Committee colleagues designed a BPC survey specific to IO to better understand what services are available at NCCN Member Institutions. Fifteen survey questions were designed to capture details regarding availability and types of IO services offered at NCCN Member Institutions (Table 1). A literature search informed the IO services included in the survey, with an option for "other." The survey was available to 34 NCCN Member Institutions, and 29 centers responded to the survey questions. Multiple questions were incorporated to understand department structure, staffing responsibilities, and metrics used to track outcomes and productivity. Additionally, questions regarding patient referrals, reimbursement, and funding were included; however, specific financial data were not collected.

The survey, initially piloted by one center for clarity and completeness, was distributed without amendment to BPC members using a web-based survey tool (SurveyMonkey, San Mateo, CA). Best Practices Committee members were asked to forward the survey to a content expert within their institution and provide one response per institution. Data were analyzed using descriptive statistics.

RESULTS

Survey data were collected from NCCN Member Institutions from January 31, 2024, through February 14, 2024. Twenty-nine centers (85%) responded to the survey. Of the 29 survey respondents, 100% offer IO services. Methods to access services, types of integrative services offered, and the structure of funding, organization, and referral processes vary significantly among institutions and are reported here.

Table 1. Integrative Oncology Survey Questions

1. Does your cancer center offer Integrative Medicine services?	
Yes	
No, however our center is planning to create a team/department	
No	
2. What types of Integrative Medicine services does your cancer center offer to oncology patients? Check all that apply:	
Acupuncture/acupressure	
Aromatherapy	
Massage therapy	
Mind-body practices	
Music therapy	
Nutritional/dietary services	
Physical therapy/occupational therapy	
Sex therapy	
Sleep management	
Stress and anxiety management	
Other, please specify	
3. How are Integrative Medicine services funded in your organization? Please check all that apply.	
Billing for provider visits	
Patients primarily pay out of pocket	
Integrative Medicine services are primarily donor funded	
Grants	
Other, please specify	
4. What structure best describes Integrative Medicine at your center?	
Centralized Integrative Medicine Department or Clinic within the cancer center	
Decentralized Integrative Medicine providers and/or services throughout the cancer center	
Health System Integrative Medicine providers and/or services that cancer center patients can access	
Other, please specify	
5. Please describe your cancer center's Integrative Medicine reporting structure:	
Write in	
6. If your cancer center utilizes Integrative Medicine APPs, what patient visit types do APPs see?	
New patient visits only	
Established patient visits only	
Both	
No Integrative Medicine APPs	
Other, please specify	
7. If your cancer center utilizes therapists, how are they employed?	
Rows	Columns
Acupuncture	Employed as independent entity or contractor
Counseling/Mental health	Employed by the cancer center/healthcare organization
Massage therapy	Not applicable
Mind-body practices	Unknown
Music therapy	
Sex therapy	

Note. IM = integrative medicine; APP = advanced practice provider; EMR = electronic medical record; NCCN = National Comprehensive Cancer Network; wRVU = work relative value unit; PT = physical therapy; OT = occupational therapy.

Table 1. Integrative Oncology Survey Questions (cont.)

8. For therapists employed as independent entities or contractors, do the therapists provide supplies related to services provided (i.e., acupuncture/massage therapy equipment, musical equipment, etc.)?
Yes
No
9. How are patients referred to Integrative Medicine services? Please check all that apply.
A provider must refer patients
Patients are referred according to algorithm/guideline
Patients can self-schedule without a referral
Other, please specify
10. Are patients scheduled to meet with an Integrative Medicine physician, APP, or nurse before accessing integrative therapies (i.e., acupuncture/acupressure, aromatherapy, massage therapy, etc.)?
Yes
No
11. If patients meet with an Integrative Medicine physician, APP, or nurse before accessing services, what is the format for the majority of those provider visits?
In person
Virtual or telehealth
Other, please specify
12. What percent of your cancer center's scheduled Integrative Medicine appointments are:
No shows
Cancellations
13. What metrics does your cancer center use to measure the outcomes for the Integrative Medicine team/department? Please check all that apply:
Patient experience surveys
Visit volumes
Progress notes in EMR
Volume of oncology patients seen by Integrative Medicine team/department
Integrative Medicine team/department consults for oncology patients
Referring staff/faculty satisfaction
Integrative Medicine staff/faculty satisfaction
NCCN Distress Thermometer
Quality of life assessment tools (Please specify)
Other, please specify
14. Does your cancer center have productivity expectations (e.g., volume, wRVU targets, etc.) for Integrative Medicine physicians and APPs?
Write in
15. Does your cancer center have productivity expectations (e.g., volume, wRVU targets, etc.) for Integrative Medicine therapists (i.e., acupuncture/acupressure, aromatherapy, massage therapy, etc.)?
Write in

Note. IM = integrative medicine; APP = advanced practice provider; EMR = electronic medical record; NCCN = National Comprehensive Cancer Network; wRVU = work relative value unit; PT = physical therapy; OT = occupational therapy.

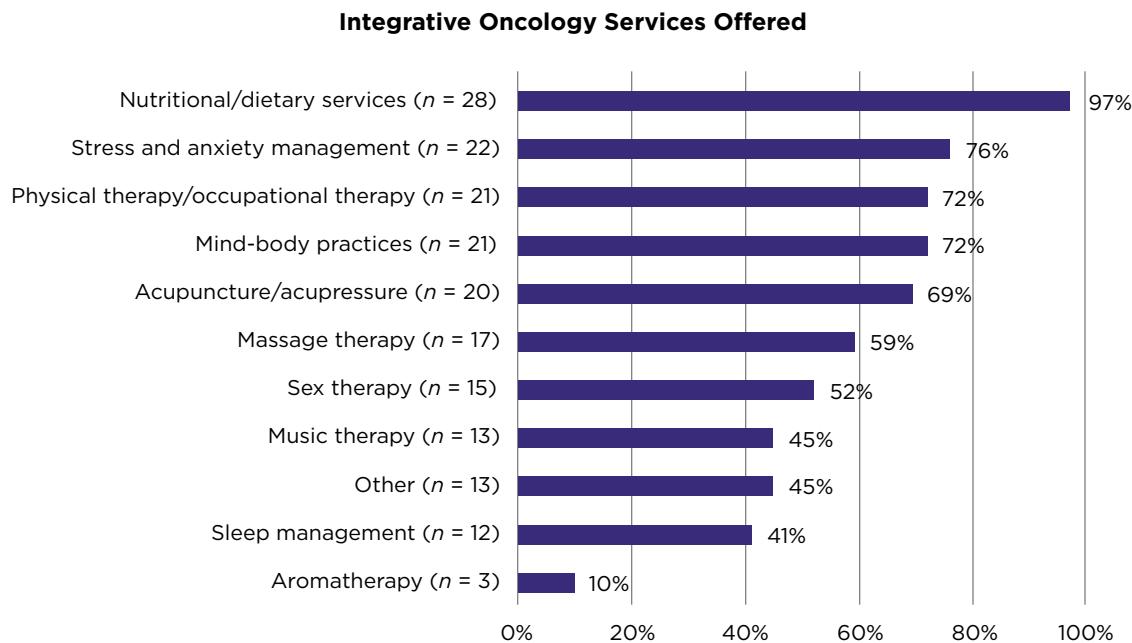


Figure 1. Types of integrative oncology services offered at National Comprehensive Cancer Network (NCCN) Member Institutions ($N = 29$).

Services Provided

Essentially all respondents (97%) provide nutritional and dietary services (Figure 1). In decreasing percentages, additional services offered included stress and anxiety management (76%), mind-body practices (72%), physical and occupational therapy (72%), and acupuncture/acupressure (69%). Centers also offer massage therapy (59%), sex therapy (52%), music therapy (45%), and sleep management (41%). Respondents also reported other services available outside of the listed options (45%), such as art therapy, exercise counseling, nature therapy, and yoga.

Funding

There is significant variation in how IO therapies are funded within centers (Figure 2). The majority of centers (79%) bill for provider services, while donor funding (59%) and grants (28%) subsidize the cost of therapeutic services at others. Some centers also reported that patients primarily pay out-of-pocket for IO services (41%). A few centers cited mixed funding sources based on IO services; however, these data were not captured in detail.

Organizational Structure

The organizational structure of IO services differs based on both the integrative therapy offered and the center providing services. More than a third (38%) of NCCN Member Institutions described their IO services as decentralized, with providers and services offered throughout the cancer center. Other members (35%) have a centralized, full-service IO department and clinic that receives referrals and schedules appointments while providing an extensive list of services. Seventeen percent of member institutions use a combination of centralized and health system-wide approaches, as previously described, dependent on the specific practices sought by the patient and availability of the provider. Finally, 10% of centers reported that their patients with cancer access integrative medicine services within the larger health system.

Administrative Reporting Structure

Twenty-three centers (79%) provided details on their IO reporting structure. Responses ranged from a standardized structure of a department

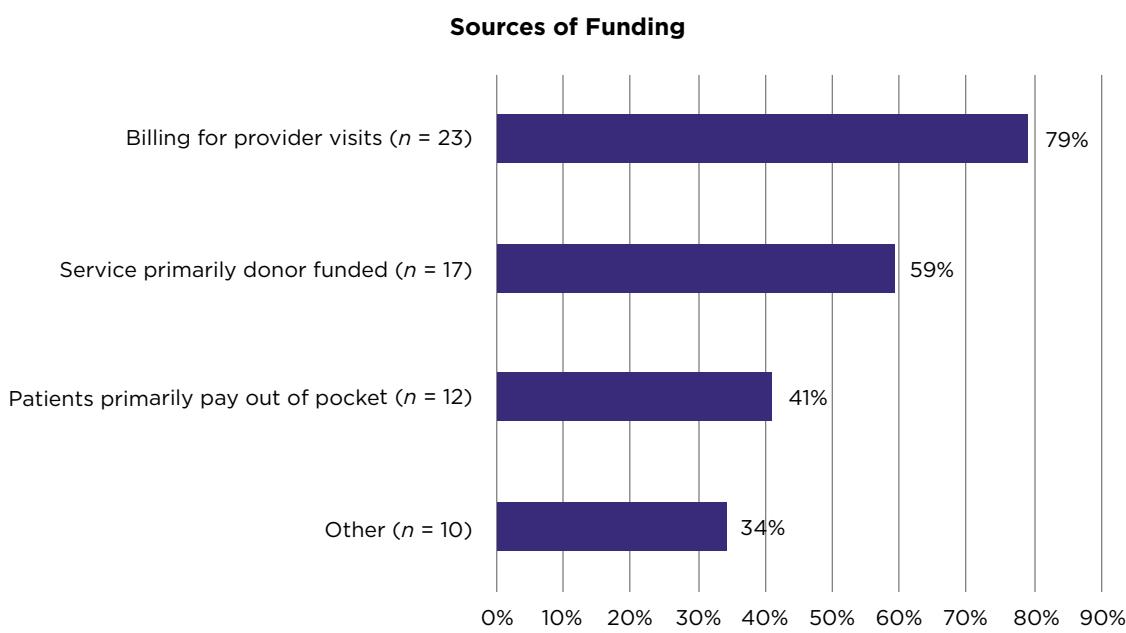


Figure 2. Sources of funding for integrative oncology services at National Comprehensive Cancer Network (NCCN) Member Institutions ($N = 29$). Each integrative oncology program may include multiple sources of funding.

within a division with all the associated administrative support, an established cancer service line, reporting to institutional clinical leadership, and a reporting structure dependent on the service provided. One institution reported their center has no formal reporting structure for IO services.

Advanced Practice Providers

Advanced practice providers (APPs), the standard descriptor for physician associates (PAs) and advanced practice nurses (APNs), are utilized in varying degrees across responding centers. The majority of NCCN Member Institutions that responded do not employ APPs for IO services (61%). Ten NCCN Member Institutions (34%) reported APPs delivering at least some IO care, including nine centers that utilize APPs for both new and established patients. One center limits APP care to established patients only, and one center does not currently utilize APPs for IO, however, plans to offer APP appointments soon.

Employment Structure of Integrative Oncology Therapists

National Comprehensive Cancer Network Member Institutions reported varying structures, dependent on either the therapist's role or services provided (Table 2). Most organizations utilize a mix of providers both employed by the cancer center/health-care organization (97%), as well as independent contractors (26%). Of the 25 centers that offer counseling and mental health services, 100% of mental health providers are employees of the cancer center/health-care organization. Similarly, most centers offering sex therapy as an IO service ($n = 14$) directly employ sex therapists (93%). Acupuncture is also a commonly provided service offered at 72% of responding centers ($n = 21$). Of those that provide acupuncture, 81% employ their acupuncturists, while 19% utilize independent contractors. Seventy-eight percent of members who provide massage therapy ($n = 19$) employ massage therapists, while 11% use independent contractors, and another 11% of respondents were unsure of the employment model for

Table 2. Employment Types of Integrative Oncology Therapists at National Comprehensive Cancer Network (NCCN) Member Institutions (N = 29)

	N	%
Counseling/mental health	25	86.2%
Employed by the cancer center/health-care organization	25	100.0%
Employed as independent entity or contractor	0	0.0%
Unknown	0	0.0%
Sex therapy	14	48.3%
Employed by the cancer center/health-care organization	13	92.9%
Employed as independent entity or contractor	0	0.0%
Unknown	1	7.1%
Acupuncture	21	72.4%
Employed by the cancer center/health-care organization	17	81.0%
Employed as independent entity or contractor	4	19.0%
Unknown	0	0.0%
Massage therapy	19	65.5%
Employed by the cancer center/health-care organization	15	78.9%
Employed as independent entity or contractor	2	10.5%
Unknown	2	10.5%
Music therapy	12	41.4%
Employed by the cancer center/health-care organization	9	75.0%
Employed as independent entity or contractor	1	8.3%
Unknown	2	16.7%
Mind-body practices	20	69.0%
Employed by the cancer center/health-care organization	14	70.0%
Employed as independent entity or contractor	5	25.0%
Unknown	1	5.0%

this specialty. For centers that offer music therapy ($n = 12$), 75% employ music therapists, 8% utilize independent contractors, and 17% use either volunteers or did not specify their staffing model. Finally, 70% of centers directly employ mind-body therapists ($n = 20$), 25% offer mind-body services through independent contractors, and the remaining 5% are unspecified as to employment status.

Patient Referral Processes

Survey responses revealed several options for patients to access IO services. Referral by a provider is the most common pathway (72%). However, 62% of responding institutions also allow patients to self-schedule an IO service, such as massage therapy or group classes, without a referral. A patient referral algorithm or guideline is used by 21% of

centers to connect patients to cancer support services depending on the specific therapy requested. Notably, patients are not required to meet with a medical provider prior to accessing specific therapies such as aromatherapy, massage therapy, and acupuncture/acupressure at the majority (83%) of cancer centers. Centers that require a referral from an IO provider before accessing integrative therapies ($n = 5$) typically see patients via telehealth (20%), in-person (40%), or a combination of telehealth and in-person (40%) with subsequent referral to appropriate therapists or practices.

Outcome Metrics for Integrative Oncology Teams

Visit volumes (84%), followed by patient experience surveys (72%), are the most common metrics

used to assess outcomes for IO teams/services. National Comprehensive Cancer Network Member Institutions also use the volume of cancer patients seen (44%), progress notes in the electronic medical record (32%), volume of IO consults (32%), referring staff/faculty satisfaction (24%), IO staff/faculty satisfaction (24%), quality of life assessment tools (20%), and the NCCN Distress Thermometer (12%) as additional measures for patient outcomes and quality of care provided.

Productivity Measures for Integrative Oncology Providers

Most NCCN Member Institutions acknowledged productivity expectations such as volume and work relative value unit (wRVU) targets for physicians and APPs. However, specific metrics were not ascertained in this survey. The most common measure noted was scheduled template volumes.

DISCUSSION

Patients with cancer often use IO therapies to address unmet needs in managing symptoms from cancer and the side effects of treatment (Yun et al., 2017). Here, we identified current IO program structures and described the process for care delivery among NCCN Member Institutions offering integrative therapies for patients with cancer. Notably, 100% of members who responded to the survey (29/29) reported offering IO therapies to patients. However, it is not understood if the remaining 15% of members ($n = 5$) did not respond to the survey because integrative services were not offered at their institution and/or if the institution's content expert was unable to respond within the specified survey timeframe.

The results of this survey suggest most members offer nutritional/dietary services (97%) to patients. This is likely due to existing guidelines stating patients with cancer should be screened for malnutrition and metabolic disorders that may occur as a result of cancer and/or cancer treatment (Arends et al., 2017). In addition, this may be related to the billable nature of nutrition/registered dietitian services, which is frequently covered by insurance, although insurance reimbursement levels for these services are low. Additionally, information related to nutritional supplements is a high priority for patients with

cancer (Dhakal & Bhatt, 2024). Vitamins/minerals, herbs/supplements, and specific diets are three of the most common therapies patients receive recommendations or request information about following a cancer diagnosis (Hutten et al., 2023). Given the access to nutrition services and patient interest, cancer and nutritional outcomes should be routinely incorporated into integrative therapy programs to better understand patient experience and how nutritional interventions may impact cancer outcomes (Dhakal & Bhatt, 2024).

Advanced practice providers in oncology often manage symptoms caused by cancer and cancer treatment using a holistic care approach (Cairo et al., 2017). However, only 34% ($n = 10$) of the responding NCCN Member Institutions utilized APPs within their IO programs. An IO practice model integrating APPs could provide more access to IO services and leverage APP knowledge of symptom management and supportive care. For APPs interested in IO, additional training and education courses on evidence-based incorporation of integrative therapies into oncology care are available. Some examples include Memorial Sloan Kettering Cancer Center's Fundamentals of Integrative Oncology course, Mayo Clinic's Integrative Oncology for Healthcare Professionals Online Course, and the University of Michigan Integrative Oncology Scholars Program, which offers a 1-year certificate and 2-year integrative oncology fellowship.

Lack of payer coverage, institutional resources, and patient financial resources are some of the challenges cancer centers must address in developing an IO practice or service (Latte-Naor & Mao, 2019). The variability in funding sources and reporting structure demonstrates NCCN Member Institutions' innovation to fill an unmet need for patients wanting IO services. A unique example of this includes one center that provides an online mind-body platform through a membership subscription for patients with cancer.

Limitations

It is important to note the limitations of this survey when evaluating IO models of care. Although we were able to determine IO practices offered, specific details regarding frequency of access are

not available. In structuring a future program for IO services, it would be beneficial to assess which services patients most frequently request and prioritize availability based on patient preference/access. This is especially true for institutions that have multiple locations/sites, to which providing IO to patients at all sites may pose a significant challenge (Semeniuk et al., 2023). Another limitation is that details regarding specific types of mind-body practices offered were not queried in the survey. Additionally, the survey did not inquire whether IO services were offered in conjunction with survivorship programs, although one center did note that IO consults are provided within their survivorship program. Finally, responses received were only from NCCN Member Institutions providing IO services ($N = 29$), thus allowing for potential responder bias.

CONCLUSIONS

Patients with cancer often look to complementary modalities to address treatment-related side effects of a cancer therapy regimen, as well as prevent possible recurrence (Lacey et al., 2024). This information regarding NCCN Member Institution IO practices provides cancer providers insight into IO services most often sought by patients with cancer. As detailed in this survey, many components of IO can be integrated into active treatment and have the potential for inclusion in survivorship programs to meet the diverse needs of patients. Despite some limitations, the data collected as part of this survey is the first dataset to provide system-level characteristics of IO models of care offered at NCCN Member Institutions. ●

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Disclosure

The authors have no conflicts of interest to disclose.

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