



Establishing an Integrative Oncology Service: Essential Aspects of Program Development

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Accepted: 5 February 2024

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Abstract

Purpose of Review Over the last 2 decades, integrative oncology (IO) has seen exponential growth within cancer care. It aims to combine evidence-based complementary therapies with conventional treatments to improve the well-being and quality of life for individuals dealing with cancer. The proliferation of integrative medicine programs in major cancer centers globally reflects varying approaches shaped by cultural, demographic, and resource-based factors.

Recent Findings Drawing upon the expertise of leaders in IO from the Society for Integrative Oncology (SIO) Clinical Practice Committee, this manuscript serves as a practical guide for establishing an IO practice. Collating insights from diverse professionals, including oncologists, integrative oncologists, supportive care physicians, researchers, and clinicians, the paper aims to provide a comprehensive roadmap for initiating and advancing IO services. The primary objective is to bridge the gap between conventional cancer care and complementary therapies, fostering a patient-centric approach to address the multifaceted challenges encountered by individuals with cancer.

Summary This paper delineates several key sections elucidating different aspects of IO practice. It delves into the core components necessary for an IO service's foundation, outlines the initial medical consultation process, and presents crucial tools essential for successful consultations. By consolidating insights and expertise, this manuscript seeks to facilitate the integration of IO into mainstream cancer care, ultimately enhancing patient outcomes and experiences.

Keywords Complementary medicine · Integrative oncology · Cancer care · Practice guidelines · Patient-centered care · Supportive care

Introduction

The consensus definition characterizes integrative oncology (IO) as a “patient-centred, evidence-informed field that utilizes practices engaging the mind and body while incorporating natural products, and embracing lifestyle modifications, drawn from various traditions” [1]. IO as a field of medicine aims to interweave these elements harmoniously with conventional cancer treatments to optimize health, enhance the quality of life, and improve clinical outcomes

across the entire spectrum of cancer care, spanning from prevention to post-treatment.

This paradigm shift has spurred health systems and cancer centers internationally to incorporate IO principles into their care delivery ecosystem [2, 3]. Historically, each entity has developed its own IO program, in alignment with its own organizational culture, setting, and resources, towards serving the needs of its community [4].

Here, the Society for Integrative Oncology (SIO) Clinical Practice Committee provides a comprehensive practical guide on IO care delivery for those looking to integrate or grow the IO presence in their cancer clinical setting. The insights within this guide draw from a diverse group of professionals, including medical and radiation oncologists, integrative medicine, supportive and palliative care physicians, researchers, and multidisciplinary IO practitioners. Most of

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This manuscript came as a result of collaborative effort of the members of the Society for Integrative Oncology Clinical Practice Committee.

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the authors hold leadership positions in the field of IO as clinicians, service leads, and/or academicians.

Our mission is twofold: first, to shed light on the roadmap for those who are pioneering the establishment of new IO services, and second, to offer insights and best practices for those who are looking to enhance and develop their existing IO programs.

In the pages that follow, we will explore the essential components of establishing an IO service within an academic or community-based oncology center. This endeavor will encompass everything from the core principles and early establishment of IO services to the initial medical consultations, essential tools, symptom management, inpatient and outpatient care models, the integration of telehealth, the intersection of research and clinical practice, the economics of health, overcoming barriers, and the promotion of multidisciplinary collaboration.

Initiating and Establishing an Integrative Oncology Service

Establishing an IO service is a significant step towards providing a holistic, patient-centered cancer care experience. This journey to bring IO into cancer care may follow one of several pathways explored here, each with its unique challenges and opportunities.

Setting the Standard

Regardless of the chosen pathway, setting a high standard of care is paramount. This entails delivering quality, coordinated, evidence-informed care; creating streamlined referral pathways; maintaining clear communication before and after consultations; credentialing providers; and establishing terms of reference and scopes of practice. This also includes oncology specific education and training for providers. These measures reduce risks to the institution and enhance the integration of IO services. Financial models also play a crucial role, ensuring that a sustainable model of care is built from the early stages. Inclusion of the consumer and patient advocate's voice is a fundamental element, as their insights and preferences are essential for tailoring care. Additionally, cultural humility, alongside clinical expertise, is vital for all practitioners and may vary across global settings [5–9].

Pathway #1: Initiation and Growth from the Outside

In some instances, the journey begins when an IO program or service does not yet exist. Here, you may receive an invitation to establish the IO service. To succeed in this scenario, the identification of key stakeholders, effective referral strategies, and a focus on delivering high-quality care are

critical. This involves the development of sound communication strategies, medical record integration, and a credentialing process for the multidisciplinary team. Some programs benefit from philanthropic support, enabling them to take calculated risks and invest in team development, marketing, and infrastructure. For others, a more cautious approach begins with a solid foundation incrementally developing an interdisciplinary team.

Pathway #2: Growth from the Inside

The landscape of cancer care is evolving rapidly due to the changing demographics of people living longer with a cancer diagnosis. Increasingly, cancer patients are interested in exploring complementary therapies as part of their comprehensive cancer care [10, 11]. This shift in expectations fuels the growth of IO services. Research and the publication of expert guidelines have been instrumental in identifying the unmet needs of this population. As a result, more centers are establishing “wellness or well-being centers,” IO services, and supportive care or survivorship programs; integrative therapies are an important component of these evolving services [12].

Pathway #3: External/Independent Service to the Cancer Center

In some regions and healthcare systems, creating an external, independent IO service is the only viable option. This may include establishing telehealth or online-based services, satellite wellness programs, and private businesses. However, the governance of such programs is nuanced and varies across states and countries.

Regardless of the chosen pathway, adhering to the fundamental principles of the IO approach is important. This ensures that evidence-based and evidence-informed interventions are consistently delivered. The name of the program can also impact its perception. IO is still a relatively new concept in cancer care and can be misunderstood. Some programs operate under the umbrella of Supportive Care or Supportive Oncology, while others combine these terms or identify as IO, Integrative Medicine, or Wellness Services [2, 3, 7, 8, 12]. If the service is attached to a comprehensive cancer center, it may function as part of a clinical or research department or exist as a standalone entity. Clearly defining the service's vision and mission can assist in finding a suitable name, although in some instances, naming may be influenced by external factors. We recommend using the name “integrative oncology” in practices offering integrative therapies to cancer patients or survivors or “integrative medicine” if the service also caters to non-cancer patient population.

As we venture into the establishment of an IO service, the importance of cultural humility, patient-centered care, and collaborative, evidence-based practices become increasingly evident. The journey has begun, and the destination promises a more holistic and compassionate approach to cancer care.

Service Structure

Within both academic and community cancer centers, IO programs have become integral components of comprehensive cancer care [1, 4, 7, 13]. These services integrate evidence-based conventional treatments with complementary therapies to address not just the physical aspects of cancer but also its emotional and psychological dimensions. As patients experience these comprehensive IO services, they receive holistic care that addresses not only their physical health but also their emotional and psychological well-being. This approach aims to optimize their overall quality of life and empower them to actively participate in their cancer care journey.

A Collaborative Approach

Multidisciplinary teams (MDTs) are an essential component of comprehensive cancer care, including the expertise of medical, radiation, and surgical oncologists, allied health professionals, and palliative care experts. Physicians and clinicians from IO programs or centers can contribute meaningfully to comprehensive care teams. This collaboration results in the creation of personalized treatment plans that seamlessly integrate both conventional and complementary therapies [13, 14].

Patient-Centered Care

The cornerstone of IO services is patient-centered care [1]. It commences with an initial consultation with a healthcare professional who is well versed in the complexity of cancer, treatment modalities, common side effects, and complementary therapies. Better understanding of the patient's unique needs and treatment goals enables the creation of a comprehensive IO care plan that can complement conventional treatment. In cases where an integrative physician is not available, some centers rely on other healthcare practitioners or care coordinators to identify and manage a person's IO needs.

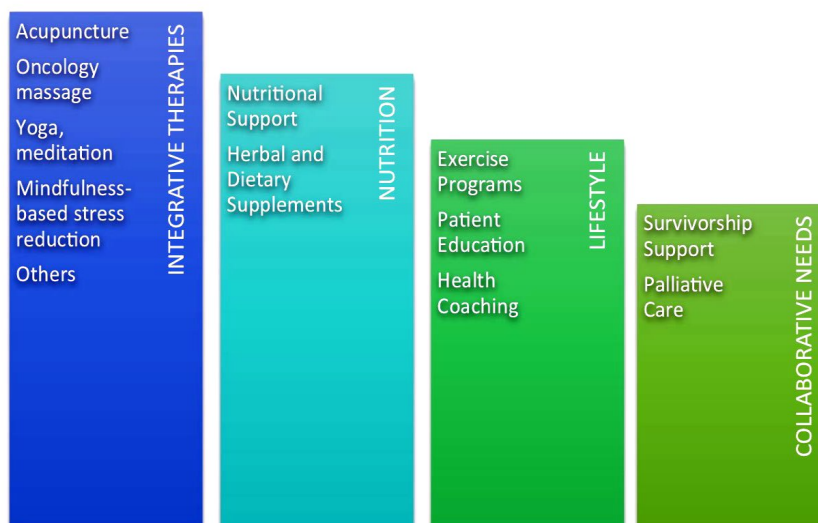
Supportive Therapies

IO programs offer a wide array of supportive therapies [15]. These may include acupuncture, oncology massage therapy, yoga, meditation, mindfulness-based interventions, reflexology, nutrition, selected natural/non-pharmaceutical products, homeopathy, and music therapy. These therapies are grounded in evidence and aim to alleviate treatment side effects, reduce stress, and enhance overall well-being. They also empower patients to make lifestyle changes that can improve their quality of life and health outcomes (Fig. 1) [16].

Nutritional Support

Nutrition stands as a cornerstone in the realm of integrative oncology (IO) services, providing patients with vital guidance on optimizing their dietary habits from diagnosis throughout their cancer journey. In many cancer centers, specialized dietitians or nutritionists equipped with expertise in cancer care offer tailored dietary advice to manage treatment-related side effects and promote overall health.

Fig. 1 Core components of a multidisciplinary, collaborative, patient-centered integrative oncology service



Beyond basic nutrition, some centers emphasize anti-inflammatory diets, microbiome-guided consultations, intermittent fasting, and culinary medicine programs, all aimed at bolstering patients' well-being [17, 18, 19••]. These recommendations extend to dietary supplements, with a keen focus on evaluating the evidence and safety of each approach.

Dietary Supplements in Cancer Care

Natural products, including herbs and dietary supplements, are commonly embraced by cancer patients but often without coordination with their primary oncology team [20]. To address this gap, health providers such as physicians and pharmacists play a pivotal role in guiding patients on the safe use of selected supplements, ensuring they complement rather than compromise conventional treatments [21]. Robust protocols and integration of natural products research help bridge evidence gaps and inform safe usage practices [21–24]. Recent initiatives advocate for open dialogue, balancing factual information with acknowledging uncertainties surrounding supplement use [25]. Moreover, the consultation extends its purview to cover both prescription and non-prescription medications, where physicians meticulously evaluate potential interactions between medications and supplements, often leveraging clinical pharmacists' expertise to ensure patient safety and optimize treatment outcomes [25]. This collaborative effort not only enriches patient care but also fosters enduring relationships between healthcare providers, laying the foundation for comprehensive cancer care beyond the confines of the initial consultation timeframe. Table 1 provides valuable resources and databases for reference.

Exercise Programs

Physical activity and personalized exercise programs are an integral part of supportive cancer care within IO services. Experienced and trained professionals work with patients to develop personalized exercise programs. These programs aim to improve physical function, reduce treatment-related toxicities, improve cancer outcomes, and manage risk factors. Additionally, they contribute significantly to the enhancement and maintenance of well-being and quality of life. Research supporting exercise in cancer care is well documented, highlighting its positive impact on patient outcomes [26]. While yoga, tai chi, and qigong offer movement and physical activity, they are often listed as part of the mind–body therapies.

Patient Education

Education is an important aspect of IO services as it empowers patients and caregivers and enhances self-efficacy.

Patients may receive verbal, written, and audio- or video-based information as part of an educational initiative. Workshops and seminars are also available to help patients understand the integrative approaches being offered and make informed decisions [2, 9, 14, 16]. Some hospitals even have patient libraries or learning centers staffed with health education specialists [9]. Additionally, many centers have developed web-based and online resources to share with patients. These resources aim to provide patients with accessible and up-to-date information to support their journey and empower them to make informed decisions and actively engage in their care.

Survivorship Support

As patients live longer with cancer, IO services increasingly focus on survivorship including strategies to prevent recurrence and to address symptoms related to the cancer or its treatment. These programs not only address the challenges of living with cancer but also extend to those living with advanced cancer. In many centers, there are overlaps between survivorship services and other IO components. A proactive approach ensures collaboration to meet the diverse needs of patients during their survivorship journey [27, 28].

Palliative Care

The scope of IO extends to palliative care and end-of-life care, with a specific focus on symptom management and enhancing the quality of life for patients with advanced cancer. Some palliative care programs may already include individuals with expertise in integrative medicine as part of their multidisciplinary teams. The provision of touch therapies, particularly for patients nearing the end of life or in hospice settings, is a developing practice [29].

Health Coaching

To further support patients in implementing recommendations, IO services often include health coaching or health psychology. This increasingly common practice plays a crucial role particularly for making recommended lifestyle and behavior changes during treatment, in the survivorship phase and for patients living longer with advanced cancer diagnoses. In addition, this may also help to reduce the cancer recurrence risk by reducing the risk factors, for example, reducing obesity among breast cancer patients. Some IO practices utilize health psychologists to play a crucial role in weight management programs and to develop behavioral strategies to promote weight loss [30]. Depending on the setting and patient access, health coaches or health psychologists may be available to guide patients in making lifestyle

Table 1 Useful resources for use in patient consultation and education and safe use of herbs and supplements, evidence to guide recommendations

	Resource	About the resource	Fees	URL
Resources with user or group fees	Natural Medicines	<ul style="list-style-type: none"> • Comprehensive unbiased resource with supplement/herbal evidence grades, interaction checker • Multidisciplinary contributors • Clinician level; not very accessible to patients 	Yes, institutional or SIO member licenses available	https://naturalmedicines.therapeuticresearch.com
	Lexicomp	<ul style="list-style-type: none"> • Diverse collection of contributors with thorough review of all monographs • Ongoing surveillance of up-to-date information from manufacturers 	Yes, institutional license	https://www.wolterskluwer.com/en/solutions/lexicomp
	Stockley's Drug Interactions/Herbal Interactions/Interaction Checker	<ul style="list-style-type: none"> • Smaller collection of contributors mainly composed of pharmacology disciplines • Large collection of medication, supplement, and herbal interactions and drug monographs 	Yes, institutional license	https://www.medicinescomplete.com/log-in/
	KNOW (Knowledge in Integrative Oncology Website)	<ul style="list-style-type: none"> • Smaller collection of contributors mainly composed of naturopathic disciplines (mostly FABNO) • Offers comprehensive searching mechanisms to find articles related to integrative oncology • Similar to a PubMed for integrative oncology with link to article • Breaks down quality of data from meta-analysis to pending summaries 	Yes, institutional license	https://www.knowintegrativeoncology.org/
No-cost resources	National Institutes of Health Office of Dietary Supplements-Health Information	<ul style="list-style-type: none"> • Database of ingredient labels for various supplements • Audience are healthcare providers and less accessible for patients 	Free	https://ods.od.nih.gov/HealthInformation/healthprofessional.aspx
	Memorial Sloan Kettering Cancer Center's About Herbs	<ul style="list-style-type: none"> • Comprehensive database of herbal supplements with easy to read information • Written both at the patient level and healthcare provider level • References given for each monograph 	Free	https://www.mskcc.org/cancer-care/diagnosis-treatment/symptom-management/integrative-medicine/herbs/search
	CancerChoices	<ul style="list-style-type: none"> • High yield references addressing some of the most common IO therapies from herbs, nutrition, energy work • Easy to read and digest and therefore a nice quick bedside reference before, during, or after patient visits 	Free	https://cancerchoices.org/resources/reviews-of-complementary-therapies/
	European Scientific Cooperative on Phytotherapy (ESCoP)-Table of herb-drug interactions	<ul style="list-style-type: none"> • Multinational collaborative group in Europe addressing various phytotherapies • Specific indications discussed for each <p>More limited contributing members</p>	Free (individual monographs require subscription)	https://escop.com/interactions/
	Society for Integrative Oncology (SIO) Website	<ul style="list-style-type: none"> • Collaborative multidisciplinary effort with diverse range of references and media • Ongoing webinars and podcasts accessible to both patients and providers • Evidence guidelines for specific IO indications in partnership with ASCO • Monthly IO digest addressing up-to-date topics 	Free PLUS more with SIO membership access	https://integrativeonc.org/knowledge-center/training-modules

changes, fostering well-being, and improving their overall quality of life [30].

The Comprehensive Initial Consultation

At the core of the initial integrative oncology (IO), consultation lies a holistic evaluation of the individual, rooted in a bio-psychosocial care model. This thorough assessment serves as the foundation for guiding patients through counselling and treatment across their cancer journey. This approach remains consistent across various cancer types and stages of the disease trajectory, ensuring that each patient receives tailored care aligned with their unique needs and circumstances. It creates a strong foundation, ensuring that the patient's whole being is considered as they navigate through their cancer care. This approach prioritizes the patient's well-being and empowers them to actively participate in their care plan.

The integrative oncology consultation encompasses several vital components, beginning with a thorough exploration of the patient's journey and concerns. This journey includes an in-depth review of personal and family history, past and ongoing treatments, and the incorporation of complementary approaches—all viewed through the lens of the patient's sociocultural context. Lifestyle factors, including physical activity, nutrition, supplements, and emotional well-being, are integral aspects of this holistic assessment. Central to the consultation is a focus on the interconnectedness of mind–body–spirit and the patient's primary concerns. Ultimately, this collaborative process culminates in the development of a multidisciplinary care plan, embracing an integrative approach to optimize patient outcomes (Table 2).

This approach places a strong focus on understanding how the disease and its treatment affect the individual. It

seeks to uncover the “why” behind their desire for a consultation, their primary concerns, and the key reasons driving their search for integrative care. The care elements uncovered in the comprehensive assessment can be revisited and revised in subsequent appointments [31].

How this consultation is conducted plays an important role in its therapeutic benefits. Communication style, consultation setting, an empathic approach, and a holistic understanding of the individual are central to this process. The “what” is explored during the consultation, and the recommendations that arise inform the holistic treatment and therapeutic plan moving forward [30]. The actual content of the consultation may involve discussions on lifestyle modification, nutrition, exercise, stress management, sleep quality, mind–body practices, symptom management, and the safe use of herbs, complementary medications, and supplements [31–33]. However, the specifics depend on the reason for consultation, the patient's disease status, and their current self-identified needs; therefore, the recommendations are personalized to each patient. The consultation extends to concurrent medical conditions, risk factors for symptoms, cardiac risks, lifestyle factors that could impact symptoms, cancer treatment toxicity, and short- and long-term outcomes. A close history may often guide a laboratory assessment to identify potentially reversible or modifiable risk factors to proactively promote well-being. Developing a therapeutic relationship and a structured plan to move forward may occur over several consultations, to adjust to the complexity of the patient experience, their treatment, and the timing of the IO consultation [34, 35].

No two patients are the same. As such, the emphasis is on personalized care plans. These plans consider the patient's medical history, treatment regimen, preferences, goals, and the availability of various integrative therapies. The multidisciplinary team collaborates to design comprehensive care

Table 2 Components of the IO initial consultation

1. Patient history, current or recent treatment, goals: the integrative query must be structured in different items and reflects on patient concerns and patient-reported outcome measures (PROMs)
 - (a) Personal and family history
 - (b) Oncology history: Detailed diagnosis, staging, prognosis, previous, current and planned treatments, side effects
 - (c) Carry out a comprehensive assessment within the sociocultural context of the patient
 - (d) Exploring the main concerns that patients have in coming to this consultation
2. Current and past use of complementary therapies or other therapies
3. Lifestyle approach/changes and overall health
4. Physical activity
5. Nutrition and diet
6. Medications
7. Natural products (herbs and dietary supplements) and complementary medication
8. Emotional health and well-being, mind–body–spirit
9. Sleep and other concerns
10. Development of a multidisciplinary plan of care utilizing an integrative approach

strategies that address the physical, emotional, psychological, and social aspects of the patient's unique experience.

Baseline Symptom Assessment

Patient-Reported Outcome Measures (PROMs) are an essential part of the initial assessment, guiding the consultation dialogue. PROMs may include tools such as the ESAS (Edmonton Symptom Assessment score), MyCAW (Measure Your Concerns and Well-Being), and MD Anderson Symptom Inventory (MDASI), commonly used in the IO field. These tools assist the clinician in identifying symptom clusters that may be responsive to IO modalities such as acupuncture, oncology massage, exercise, and other therapeutic interventions. By addressing the patient's symptoms, concerns, and their current treatment, medication, supplements, and self-care practices, practitioners gain insights into the patient's physical and emotional well-being. The initial consultation often lasts approximately 1 h to create a calm and open environment that encourages effective communication [16, 35, 36].

Lifestyle and Overall Health

Recognizing the intricate relationship between lifestyle and cancer, the integrative consultation delves into the patient's lifestyle choices and behaviors. From physical activity to nutrition and stress management, physicians offer guidance on positive lifestyle modifications that complement medical treatments and contribute to the patient's well-being and survivorship. Strategies like health coaching and shared medical consultations, along with group education, may be used to promote healthier behaviors. Physicians assess the patient's physical activity based on established guidelines and patient-reported activity levels. Ideally, they then refer to specialist exercise practitioners (e.g., exercise physiologists and physio/physical therapists) for development of evidence-based exercise recommendations tailored to individual needs, taking potential side effects into account [37, 38]. Referrals and strategies for implementation may be discussed during this or subsequent consultations [32, 33, 35].

Emotional Health and Well-Being

The emotional well-being of patients is recognized as a vital component of holistic care. Screening for distress becomes a critical component of both initial and follow-up encounters. Emotional needs may evolve as patients traverse the challenging landscape of cancer, underscoring the importance of regular assessments in the holistic care of the whole person. Physicians aim to address emotional health through various mind-body approaches, including mindfulness, meditation, reflexology, acupuncture, yoga, and relaxation techniques.

In certain scenarios, referral to psychiatry/psychology/mental health providers is necessary. By nurturing emotional resilience in patients, physicians equip them to navigate the multifaceted challenges posed by their cancer journey. The recently published ASCO-SIO guidelines serve as a valuable resource to inform the provision of evidence-based recommendations for an integrative approach to managing anxiety and depression [39••]. Collaborating closely with a psycho-oncology team if available at your center allows practitioners to identify concerns that may benefit from a collaborative approach.

Sleep and Its Vital Role

The quality and duration of sleep can have a profound impact on a patient's overall health and recovery. Sleep disturbances are a common and significant concern for cancer patients, both during and after cancer therapy. Integrative consultations delve into sleep patterns and offer strategies to enhance sleep hygiene, contributing to the patient's vitality and well-being during treatment. Patients are given an opportunity to explore various approaches, such as cognitive behavioral therapy, acupuncture, yoga, mindfulness, meditation, and even the potential use of selected herbs and supplements. All these options can be discussed during the consultation when taking a patient's history and formulating strategies to improve sleep quality [40].

Follow-Up and Holistic Support

The initial assessment serves as the foundation for ongoing integrative care. Physicians work in conjunction with the multidisciplinary team to develop goals and interventions that are tailored to the patient's evolving needs. Regular follow-up visits provide opportunities to re-evaluate progress, adjust treatment strategies, and continue to offer holistic support. Additionally, plans to address specific side effects, such as chemotherapy-induced peripheral neuropathy or arthralgias resulting from aromatase inhibitors, are prepared. Guidelines, such as from NCCN or the recently published SIO-ASCO on pain and anxiety/depression, support the evidence-based use of IO interventions [39••, 41••]. The timing of follow-up consultations is personalized and depends on the patient's current stage of treatment and prescribed integrative care plan.

Modalities Integrated in an Integrative Oncology Clinic

Every IO clinical service has the challenge of determining which services should be included as part of their clinical center. Several factors come into play when making

this decision. These might include the availability of staff within the facility area, the specific needs and requests of their patients, research and evidence support, adherence to institutional policies, alignment with research interests, and consideration of local competition.

The Cornerstone of Mind–Body Practices

Mind–body practices are a core component of IO. Recognizing the profound connection between mental and physical health, practitioners integrate techniques such as mindfulness meditation, yoga, tai chi/qi gong, and progressive muscle relaxation into their care plans. These practices serve the dual purpose of alleviating stress and anxiety while nurturing emotional resilience and assisting in managing treatment-related symptoms [38]. Mind–body practices can also be offered in a group setting in-person and virtually and found to benefit cancer patients and caregivers [42••, 43].

Addressing the emotional and psychological challenges of cancer is integral to holistic care. Psychosocial counselling, provided by trained therapists or formal psycho-oncology programs, allows patients to explore their feelings, fears, and coping mechanisms. This therapeutic support equips patients with tools to navigate the emotional complexities of their cancer journey [38, 39, 41, 42, 44, and 45].

Traditional Medicine Practices

Acupuncture and acupressure, originating from Eastern medicine, are significant components of IO. These practices involve stimulating specific points on the body to alleviate pain, nausea, fatigue, and other treatment-related side effects. Expert acupuncturists collaborate with integrative oncology practitioners to deliver evidence-based sessions tailored to individual patient needs. An emerging subspecialty, oncology acupuncture, is in development, focusing on the unique needs of cancer patients with multiple benefits to improve symptom burden and well-being during and beyond cancer treatment [46–48]. Other traditional medicine practices are commonly used by cancer patients based on their heritage, culture, and beliefs. Ayurveda, traditional Chinese medicine, Korean medicine, homeopathy, and anthroposophic medicine are examples of whole medical systems. In such scenarios, an understanding of patient's perspectives, empathetic listening, and open communication may help build trust in physician–patient relationship. This mutual trust is important in facilitating a discussion on risk–benefit profile and drug–herb interactions. Some aspects of traditional medicine practices such as dietary use of fresh herbs/spices can be safely incorporated without interfering with patients' conventional cancer therapies. Furthermore, some facilities enlist the expertise of experienced naturopaths in the field of oncology to address nutritional needs

when dietitians might not have the necessary experience to provide the required guidance. This approach ensures that patients receive comprehensive and specialized nutritional support as part of their cancer care [49].

Touch: Massage and Manual Therapies

Massage, reflexology, and manual therapies have been recognized for their ability to provide both physical and psychological benefits to cancer patients. These therapies reduce muscle tension, improve circulation, and promote relaxation. In the context of integrative care, massage is customized to address specific symptoms and is performed by therapists with expertise in oncology massage techniques [36, 40, 50].

Elevating Well-Being Through Exercise, Yoga

The importance of exercise as a complementary aspect of cancer treatment is increasingly recognized [32]. IO programs develop individualized exercise plans that consider the patient's physical condition, treatment phase, and preferences [37]. Specialized exercise practitioners or physical therapists usually develop these programs and draw from established literature on the role of exercise in symptom management and also in survivorship/cancer prevention [26].

Yoga therapy is increasingly acknowledged for its therapeutic benefits in cancer care. It involves tailored yoga practices that cater to the physical and emotional needs of patients. Yoga sessions often encompass gentle postures, breathing exercises, and meditation techniques, promoting relaxation, flexibility, and emotional well-being [38, 50–52]. Yoga therapy needs to be customized per patient preference, physical abilities, and limitations that may exist during cancer therapy or from the cancer itself.

Unlocking Creative Healing with Art and Music

Art and music therapy harness the power of creative expression to promote emotional healing and reduce stress [39••, 53]. Patients can engage in artistic activities or listen to music as part of their integrative care plan, as guided by trained therapists within each discipline. These therapies offer a valuable outlet for self-expression and contribute to the patient's overall sense of well-being.

Supportive Group Programs

Supportive group programs, including support groups, educational workshops, and relaxation classes, create a sense of community and shared experience for cancer patients. These programs serve as platforms for patients to connect, share their journeys, and learn coping strategies from their peers.

Exploring Whole-System Approaches to Healing

Some IO services incorporate other healing systems such as Reiki, traditional healing, and homeopathy. The extent to which these systems are integrated depends on factors like availability and credentialing of practitioners, scope of practice, research support, integration into research protocols, and the acceptance of these therapies by the cancer center and the culture of the countries where the IO practice site is located.

Embracing Global Healing Traditions

IO goes beyond the boundaries of conventional allopathic medicine, often incorporating traditional therapies and healing systems from various cultures. The extent to which these practices are integrated depends on factors such as availability and credentialing of practitioners, scope of practice, and the cancer center's acceptance of these therapies.

Conclusions

With the expansive growth of IO and IO-based modalities over the past 20 years, there has been increased incorporation into the care of cancer patients. There are many IO modalities, and how and when they are incorporated into oncologic care is individualized to the patient and center. In this manuscript, members of the SIO Clinical Practice Committee present a framework for both current and developing IO centers seeking guidance on how to provide evidence-based complementary interventions for their patients. A foundational principle of IO is the evidence-informed integration of complementary therapies with conventional cancer treatments. For this successful integration to occur, close collaboration between integrative practitioners and the oncology team is essential. This collaborative approach not only ensures that complementary therapies harmonize with medical interventions but also fosters an environment of mutual learning and understanding, where oncologists and integrative medicine specialists engage in active knowledge exchange, thereby enriching the therapeutic landscape and paving the way for innovative approaches in patient-centered care, all united in the common pursuit of enhancing the overall well-being of the patient.

Author Contribution All authors reviewed and contributed to the manuscript.

Declarations

Competing Interests The authors declare no competing interests.

References

Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

1. Witt CM, Balneaves LG, Cardoso MJ, Cohen L, Greenlee H, Johnstone P, et al. A comprehensive definition for integrative oncology. *J Natl Cancer Inst Monogr.* 2017;2017(52):lgx012. <https://doi.org/10.1093/jncimonographs/lgx012>.
2. Seely DM, Weeks LC, Young S. A systematic review of integrative oncology programs. *Curr Oncol.* 2012;19(6):e436–61. <https://doi.org/10.3747/co.19.1182>.
3. Rossi E, Vita A, Baccetti S, Stefano MD, Voller F, Zanobini A. Complementary and alternative medicine for cancer patients: results of the EPAAC survey on integrative oncology centres in Europe. *Support Care Cancer.* 2015;23(6):1795–806. <https://doi.org/10.1007/s00520-014-2517-4>.
4. Mao JJ, Pillai GG, Andrade CJ, Ligibel JA, Basu P, Cohen L, et al. Integrative oncology: addressing the global challenges of cancer prevention and treatment. *CA Cancer J Clin.* 2022;72(2):144–64. <https://doi.org/10.3322/caac.21706>.
5. Weeks L, Seely D, DeGrasse C, Verma S, Boon H, Verhoef M, et al. Developing an operational model for an integrative oncology program: a qualitative descriptive feasibility study. *Support Care Cancer.* 2014;22(3):731–9. <https://doi.org/10.1007/s00520-013-2028-8>.
6. Semeniuk G, Bahadini B, Ahn E, Zain J, Cheng J, Govindarajan A, et al. Integrative oncology and the clinical care network: challenges and opportunities. *J Clin Med.* 2023;12(12):3946. <https://doi.org/10.3390/jcm12123946>.
7. Grant SJ, Hunter J, Bensoussan A, Delaney GP. Guidance for establishing an integrative oncology service in the Australian healthcare setting—a discussion paper. *Support Care Cancer.* 2018;26(2):471–81. <https://doi.org/10.1007/s00520-017-3851-0>.
8. Grant SJ, Hunter J, Seely D, Balneaves LG, Rossi E, Bao T. Integrative oncology: international perspectives. *Integr Cancer Ther.* 2018;18:1534735418823266. <https://doi.org/10.1177/1534735418823266>.
9. Yun H, Sun L, Mao JJ. Growth of integrative medicine at leading cancer centers between 2009 and 2016: a systematic analysis of NCI-designated comprehensive cancer center websites. *J Natl Cancer Inst Monogr.* 2017;2017(52):lgx2004. <https://doi.org/10.1093/jncimonographs/lgx004>.
10. Jones E, Nissen L, McCarthy A, Steadman K, Windsor C. Exploring the use of complementary and alternative medicine in cancer patients. *Integr Cancer Ther.* 2019;18:1534735419846986. <https://doi.org/10.1177/1534735419846986>.
11. Qureshi M, Zelinski E, Carlson LE. Cancer and complementary therapies: current trends in survivors' interest and use. *Integr Cancer Ther.* 2018;17(3):844–53. <https://doi.org/10.1177/1534735418762496>.
12. Grant SJ, Marthick M, Lacey J. Establishing an integrative oncology service in the Australian healthcare setting—the Chris O'Brien Lifehouse Hospital experience. *Support Care Cancer.* 2019;27(6):2069–76. <https://doi.org/10.1007/s00520-018-4460-2>.

13. Zollman C, Walther A, Seers HE, Jolliffe RC, Polley MJ. Integrative whole-person oncology care in the UK. *J Natl Cancer Inst Monogr*. 2017;2017(52):lgx002. <https://doi.org/10.1093/jncimonographs/lgx002>
14. Ben-Arye E, Schiff E, Shapira C, Frenkel M, Shalom T, Steiner M. Modeling an integrative oncology program within a community-centered oncology service in Israel. *Patient Educ Couns*. 2012;89(3):423–9. <https://doi.org/10.1016/j.pec.2012.02.011>.
15. Scotté F, Taylor A, Davies A. Supportive care: the “key-stone” of modern oncology practice. *Cancers (Basel)*. 2023;15(15):3860. <https://doi.org/10.3390/cancers15153860>.
16. Lopez G, Liu W, McQuade J, Lee RT, Spelman AR, Fellman B, et al. Integrative oncology outpatient consultations: long-term effects on patient-reported symptoms and quality of life. *J Cancer*. 2017;8(9):1640–6. <https://doi.org/10.7150/jca.18875>.
17. García-Montero C, Fraile-Martínez O, Gómez-Lahoz AM, Pekarek L, Castellanos AJ, Nogueras-Fraguas F, et al. Nutritional components in Western diet versus Mediterranean diet at the gut microbiota–immune system interplay. *Implications Health Dis Nutr*. 2021;13(2):699. <https://doi.org/10.3390/nu13020699>.
18. Tagliamonte S, Laiola M, Ferracane R, Vitale M, Gallo MA, Meslier V, et al. Mediterranean diet consumption affects the endocannabinoid system in overweight and obese subjects: possible links with gut microbiome, insulin resistance and inflammation. *Eur J Nutr*. 2021;60(7):3703–16. <https://doi.org/10.1007/s00394-021-02538-8>.
- 19.●● Frenkel M, Sapire KJ, Lacey J, Zollman C, Sierpina VS. “What should I eat?”-addressing questions and challenges related to nutrition in the integrative oncology setting. *Curr Oncol Rep*. 2022;24(11):1557–67. <https://doi.org/10.1007/s11912-022-01308-x>. **This manuscript addresses important questions related to nutrition during and after cancer care in the integrative oncology setting.**
20. Lee RT, Barbo A, Lopez G, Melhem-Bertrandt A, Lin H, Olopade OI, et al. National survey of US oncologists’ knowledge, attitudes, and practice patterns regarding herb and supplement use by patients with cancer. *J Clin Oncol*. 2014;32(36):4095–101. <https://doi.org/10.1200/JCO.2014.55.8676>.
21. Frenkel M, Abrams DI, Ladas EJ, Deng G, Hardy M, Capodice JL, et al. Integrating dietary supplements into cancer care. *Integr Cancer Ther*. 2013;12(5):369–84. <https://doi.org/10.1177/1534735412473642>.
22. Lee RT, Kwon N, Wu J, To C, To S, Szmulewitz R, et al. Prevalence of potential interactions of medications, including herbs and supplements, before, during, and after chemotherapy in patients with breast and prostate cancer. *Cancer*. 2021;127(11):1827–35. <https://doi.org/10.1002/cncr.33324>.
23. Lam CS, Koon HK, Ma CT, Au KY, Zuo Z, Chung VC, et al. Real-world data on herb-drug interactions in oncology: a scoping review of pharmacoepidemiological studies. *Phytomedicine*. 2022;103:154247. <https://doi.org/10.1016/j.phymed.2022.154247>.
24. Ben-Arye E, Samuels N, Goldstein LH, Mutafoğlu K, Omran S, Schiff E, et al. Potential risks associated with traditional herbal medicine use in cancer care: a study of Middle Eastern oncology health care professionals. *Cancer*. 2016;122(4):598–610. <https://doi.org/10.1002/cncr.29796>.
25. Frenkel M, Morse MB, Narayanan S. Addressing patient requests to add dietary supplements to their cancer care—a suggested approach. *Nutrients*. 2023;15(24):5029. <https://doi.org/10.3390/nu15245029>.
26. McTiernan A, Friedenreich CM, Katzmarzyk PT, Powell KE, Macko R, Buchner D, et al. Physical activity in cancer prevention and survival: a systematic review. *Med Sci Sports Exerc*. 2019;51(6):1252–61. <https://doi.org/10.1249/MSS.0000000000001937>.
27. Cutshall SM, Cha SS, Ness SM, Stan DL, Christensen SA, Bhagra A, et al. Symptom burden and integrative medicine in cancer survivorship. *Support Care Cancer*. 2015;23(10):2989–94. <https://doi.org/10.1007/s00520-015-2666-0>.
28. Glaser KM, McDaniel DC, Hess SM, Flores TF, Rokitka DA, Reid ME. Implementing an integrative survivorship program at a comprehensive cancer center: a multimodal approach to life after cancer. *J Altern Complement Med*. 2019;25(S1):S106–11. <https://doi.org/10.1089/acm.2018.0383>.
29. Frenkel M, Sapire K, Lacey J, Sierpina VS. Integrative medicine: adjunctive element or essential ingredient in palliative and supportive cancer care? *J Altern Complement Med*. 2020;26(9):779–83. <https://doi.org/10.1089/acm.2019.0316>.
30. Powers-James C, Christie AJ, Narayanan S, Liu W, Gomez T, Cohen L, Lopez G. Frequencies and predictors of health psychology referrals after integrative oncology consultation. *Supp Care Cancer*. 2022;30(8):6963–72. <https://doi.org/10.1007/s00520-022-07105-3>.
31. Frenkel M, Cohen L. Effective communication about the use of complementary and integrative medicine in cancer care. *J Altern Complement Med*. 2014;20(1):12–8. <https://doi.org/10.1089/acm.2012.0533>.
32. Stan DL, Cutshall SM, Adams TF, Ghosh K, Clark MM, Wieneke KC, et al. Wellness coaching intervention for increasing healthy behaviors in breast cancer survivors. *Clin J Oncol Nurs*. 2020;24(3):305–15. <https://doi.org/10.1188/20.CJON.305-315>.
33. Rock CL, Thomson C, Gansler T, Gapstur SM, McCullough ML, Patel AV, et al. American Cancer Society guideline for diet and physical activity for cancer prevention. *CA Cancer J Clin*. 2020;70(4):245–71. <https://doi.org/10.3322/caac.21591>.
34. Ligibel JA, Bohlke K, May AM, Clinton SK, Demark-Wahnefried W, Gilchrist SC, et al. Exercise, diet, and weight management during cancer treatment: ASCO guideline. *J Clin Oncol*. 2022;40(22):2491–507. <https://doi.org/10.1200/JCO.22.00687>.
35. Frenkel M, Cohen L, Peterson N, Palmer JL, Swint K, Bruera E. Integrative medicine consultation service in a comprehensive cancer center: findings and outcomes. *Integr Cancer Ther*. 2010;9(3):276–83. <https://doi.org/10.1177/1534735410378663>.
36. Latte-Naor S, Mao JJ. Putting integrative oncology into practice: concepts and approaches. *J Oncol Pract*. 2019;15(1):7–14. <https://doi.org/10.1200/JOP.18.00554>.
37. Lopez G, Lacey J, Christie AJ, Powers-James C, Narayanan S, Liu W, et al. Patient-reported outcomes in integrative oncology: bridging clinical care with research. *Cancer J*. 2019;25(5):311–5. <https://doi.org/10.1097/PPO.0000000000000401>.
38. Lopez G, Eddy C, Liu W, Li Y, Chen M, Bruera E, Cohen L. Physical therapist-led exercise assessment and counseling in integrative cancer care: effects on patient self-reported symptoms and quality of life. *Integr Cancer Ther*. 2019;18:1534735419832360. <https://doi.org/10.1177/1534735419832360>.
- 39.●● Carlson LE, Ismaila N, Addington EL, Asher GN, Atreya C, Balneaves LG, et al. Integrative oncology care of symptoms of anxiety and depression in adults with cancer: Society for Integrative Oncology-ASCO Guideline. *J Clin Oncol*. 2023;41(28):4562–91. <https://doi.org/10.1200/JCO.23.00857>. **An important paper**

- that came as a result of collaboration of ASCO and SIO based on accumulated evidence-based research on the value of integrative medicine in anxiety and depression management in cancer care.**
40. Narayanan S, Reddy A, Lopez G, Liu W, Ali S, Bruera E, et al. Sleep disturbance in cancer patients referred to an ambulatory integrative oncology consultation. *Supp Care Cancer*. 2022;30(3):2417–25. <https://doi.org/10.1007/s00520-021-06668-x>.
 41. ●● Mao JJ, Ismaila N, Bao T, Barton D, Ben-Arye E, Garland EL, et al. Integrative medicine for pain management in oncology: Society for Integrative Oncology–ASCO guideline. *J Clin Oncol*. 2022;40(34):3998–4024. <https://doi.org/10.1200/JCO.22.01357>. **An important paper that came as a result of collaboration of ASCO and SIO based on accumulated evidence-based research on the value of integrative medicine in pain management in cancer care.**
 42. ●● Deleemans JM, Mather H, Spiropoulos A, Toivonen K, Baydoun M, Carlson LE. Recent progress in mind-body therapies in cancer care. *Curr Oncol Rep*. 2023;25(4):293–307. <https://doi.org/10.1007/s11912-023-01373-w>. **An important paper that brings a more recent update to the evidence that accumulated in recent years about the value of mind-body therapies in cancer care.**
 43. Mallaiah S, Narayanan S, Wagner R, Cohen C, Christie AJ, Bruera E, et al. Yoga therapy in cancer care via telehealth during the COVID-19 pandemic. *Integr Cancer Ther*. 2022;21:15347354221141094. <https://doi.org/10.1177/15347354221141094>.
 44. Lopez G, Narayanan S, Christie A, Powers-James C, Liu W, Garcia MK, et al. Effects of center-based delivery of tai chi and qi gong group classes on self-reported symptoms in cancer patients and caregivers. *Integr Cancer Ther*. 2020;19:1534735420941605. <https://doi.org/10.1177/1534735420941605>.
 45. Gonzalez M, Pascoe MC, Yang G, de Manincor M, Grant S, Lacey J, et al. Yoga for depression and anxiety symptoms in people with cancer: a systematic review and meta-analysis. *Psychooncology*. 2021;30(8):1196–208. <https://doi.org/10.1002/pon.5671>.
 46. Zhang XW, Hou WB, Pu FL, Wang XF, Wang YR, Yang M, et al. Acupuncture for cancer-related conditions: an overview of systematic reviews. *Phytomedicine*. 2022;106:154430. <https://doi.org/10.1016/j.phymed.2022.154430>.
 47. Grant SJ, Spiegel G, Brand A, Kwon KK, Heller G, Choi V, et al. Acupuncture and reflexology for patients undergoing chemotherapy: a cohort study. *Integr Cancer Ther*. 2022;21:15347354221123056. <https://doi.org/10.1177/15347354221123055>.
 48. Jang S, Ko Y, Sasaki Y, Park S, Jo J, Kang NH, et al. Acupuncture as an adjuvant therapy for management of treatment-related symptoms in breast cancer patients: systematic review and meta-analysis (PRISMA-compliant). *Medicine (Baltimore)*. 2020;99(50):e21820. <https://doi.org/10.1097/MD.00000000000021820>.
 49. Souza APS, Silva LCD, Fayh APT. Nutritional intervention contributes to the improvement of symptoms related to quality of life in breast cancer patients undergoing neoadjuvant chemotherapy: a randomized clinical trial. *Nutrients*. 2021;13(2):589. <https://doi.org/10.3390/nu13020589>.
 50. Valle CG, Diamond MA, Heiling HM, Deal AM, Hales DP, Nezami BT, et al. Effect of an mHealth intervention on physical activity outcomes among young adult cancer survivors: the IMPACT randomized controlled trial. *Cancer*. 2023;129(3):461–72. <https://doi.org/10.1002/cncr.34556>.
 51. Greenlee H, DuPont-Reyes MJ, Balneaves LG, Carlson LE, Cohen MR, Deng G, et al. Clinical practice guidelines on the evidence-based use of integrative therapies during and after breast cancer treatment. *CA Cancer J Clin*. 2017;67:194–232. <https://doi.org/10.3322/caac.21397>.
 52. Cramer H, Lauche R, Klose P, Lange S, Langhorst J, Dobos GJ. Yoga for improving health-related quality of life, mental health and cancer-related symptoms in women diagnosed with breast cancer. *Cochrane Database Syst Rev*. 2017;1(1):10802. <https://doi.org/10.1002/14651858.CD010802.pub2>.
 53. Bosman JT, Bood ZM, Scherer-Rath M, Dörr H, Christophe N, Sprangers MAG, et al. The effects of art therapy on anxiety, depression, and quality of life in adults with cancer: a systematic literature review. *Support Care Cancer*. 2021;29(5):2289–98. <https://doi.org/10.1007/s00520-020-05869-0>.

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