*JNCI Cancer Spectrum*, 2023, **7(4),** pkad042
https://doi.org/10.1093/jncics/pkad042
Advance Access Publication Date: June 12, 2023
**Commentary**

# SIO-ASCO guideline on integrative medicine for cancer pain management: implications for racial and ethnic pain disparities

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## Abstract

Racial and ethnic disparities in pain management pose major challenges to equitable cancer care delivery. These disparities are driven by complex interactions between patient-, provider-, and system-related factors that resist reductionistic solutions and require innovative, holistic approaches. On September 19, 2022, the Society for Integrative Oncology and the American Society of Clinical Oncology published a joint guideline to provide evidence-based recommendations on integrative medicine for cancer pain management. Integrative medicine, which combines conventional treatments with complementary modalities from cultures and traditions around the world, are uniquely equipped to resonate with diverse cancer populations and fill existing gaps in pain management. Although some complementary modalities, such as music therapy and yoga, lack sufficient evidence to make a specific recommendation, other modalities, such as acupuncture, massage, and hypnosis, demonstrated an intermediate level of evidence, resulting in moderate strength recommendations for their use in cancer pain management. However, several factors may hinder real-world implementation of the Society for Integrative Oncology and the American Society of Clinical Oncology guideline and must be addressed to ensure equitable pain management for all communities. These barriers include, but are not limited to, the lack of insurance coverage for many complementary therapies, the limited diversity and availability of complementary therapy providers, the negative social norms surrounding complementary therapies, the underrepresentation of racial and ethnic subgroups in the clinical research of complementary therapies, and the paucity of culturally attuned interventions tailored to diverse individuals. This commentary examines both the challenges and the opportunities for addressing racial and ethnic disparities in cancer pain management through integrative medicine.

Pain is a prevalent symptom associated with poor quality of life, impaired physical functioning, and worse health-related outcomes in the cancer population (1). More than one-third of cancer patients remain inadequately treated for pain (2,3), and racial and ethnic disparities in pain management persist (4,5). These disparities present unique challenges because of their multifactorial nature and the complex interactions between patient-, provider-, and system-related factors that resist reductionistic solutions (6). Novel holistic approaches are required to make progress toward equitable cancer pain management.

In its Strategic Plan 2021-2025, the National Center for Complementary and Integrative Health (NCCIH) identified the research of complementary and integrative health (CIH) approaches to pain management as one of its top scientific priorities, with an emphasis on underserved racial and ethnic populations to address pain disparities (7). The term *complementary* refers to nonmainstream approaches used "together with" conventional medicine and is different than *alternative*, which refers to nonmainstream approaches used "in place of" conventional medicine. *Integrative* is a broader term that refers to the combined use of conventional and complementary approaches "in a coordinated way." Because of their multicultural roots and origins, complementary modalities have the potential to resonate with racially and ethnically diverse populations from around the world (8). Therefore, integrative approaches, which combine conventional medicine with complementary modalities from diverse cultures, are uniquely equipped to fill gaps in cancer pain management and reduce racial and ethnic treatment disparities.

On September 19, 2022, the Society for Integrative Oncology (SIO) and the American Society of Clinical Oncology (ASCO) published a joint guideline to provide evidence-based recommendations on CIH approaches to cancer pain management (9). The

**Received:** April 26, 2023. **Accepted:** June 02, 2023
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**Box 1. Addressing racial and ethnic disparities in cancer pain management through complementary and integrative health (CIH) approaches—key takeaways and recommendations**

Challenges and barriers

A complex interplay of patient-, provider-, and system-level factors contribute to racial and ethnic disparities in CIH use and accessibility.

- Although some CIH approaches are free or low cost, others have high out-of-pocket expenses and are not covered by insurance.
- The availability of CIH practitioners and services differs by geography, with some modalities (eg, yoga, acupuncture) being less accessible in racially and ethnically diverse and/or low-income neighborhoods.
- There is a shortage of CIH practitioners from minoritized backgrounds, which may negatively shape social norms surrounding CIH use in minoritized communities.
- Belief systems (eg, low expectations of benefit, negative social norms) may negatively influence the acceptability of CIH approaches.
- Underrepresentation of various racial and ethnic groups represents a key limitation of many trials of CIH approaches to cancer pain management.
- Culturally attuned interventions are lacking, and there is limited evidence that informs how to tailor existing treatments to diverse persons and communities.

Recommendations and future directions

More research is needed to:

- develop Medicare reimbursement policies and novel accessible care delivery models (eg, group-based format, telemedicine platforms) to reduce costs and other barriers to CIH approaches;
- address limited availability of CIH practitioners in underserved neighborhoods and promote a more diverse workforce of CIH practitioners;
- disseminate the evidence base of CIH approaches to patients, providers, and other key stakeholders;
- implement data-driven recruitment strategies to promote more diverse representation in clinical trials of CIH approaches; and
- develop and adapt evidence-based pain interventions that use CIH approaches and draw from the cultural resources and identities of diverse populations.

guideline has the potential to expand nonpharmacologic treatment options and inform culturally attuned approaches to cancer pain management; however, key issues must be tackled to ensure equitable implementation of the guideline in diverse communities. This commentary seeks to examine the challenges and opportunities for addressing racial and ethnic pain treatment disparities in oncology through the CIH approaches described in the SIO-ASCO guideline (Box 1).

## The SIO-ASCO guideline on integrative medicine for pain management in oncology

In recent decades, CIH approaches have demonstrated a growing evidence base for pain management in cancer populations that helped inform the SIO-ASCO guideline (10-12). The NCCIH has historically classified CIH modalities into 5 broad categories: mind-body practices (eg, biofeedback, meditation, yoga), body-based practices (eg, chiropractic, reflexology), alternative medical systems (eg, Chinese Traditional Medicine, homeopathy), energy therapies (eg, reiki, breathing techniques), and natural products (eg, herbal and vitamin supplements). However, in its latest strategic plan, the NCCIH adopted a new framework to classify CIH modalities on the basis of their primary therapeutic input: physical, psychological, nutritional, or a combination of these inputs.

The latest SIO-ASCO guideline covers a range of psychological (eg, hypnosis, guided imagery), physical (eg, massage, reflexology), nutritional (eg, honey, glutamine), and combined (eg, music therapy, yoga, acupuncture) approaches (9). Acupuncture, massage, and hypnosis were recommended for cancer pain management, and the moderate strength of the recommendations indicate that results were consistent across good quality studies (with only few or minor exceptions) demonstrating a true net benefit of these modalities relative to harms. Other modalities, such as music therapy and yoga, lacked sufficient evidence to recommend for or against their use in pain management, suggesting that the true magnitude and direction of effect could not be discerned from the available studies.

This guideline has key implications for current and future research efforts to make advancements toward more equitable pain management in oncology. For the CIH modalities that lacked sufficient evidence for clinical recommendations, research should examine these through the lens of unmet pain management needs in marginalized or underserved populations, prioritizing the modalities that demonstrate unique potential to resonate with diverse populations and/or fill gaps in care. For the CIH approaches that demonstrated robust evidence for cancer pain management, an important research priority should be the mitigation of racial and ethnic disparities in the use of these evidence-based modalities.

## Racial and ethnic disparities in the use of CIH approaches for cancer pain management

A large body of research has examined racial and ethnic disparities in the use of CIH approaches for pain management in cancer populations (13). Although some research has found no statistically significant differences between racial and ethnic groups (14-18), most studies have documented key disparities in the use, acceptability, and/or accessibility of CIH approaches (19-27). For example, mind-body practices (eg, prayer, meditation) are

commonly used among Black patients (28,29) and Hispanic patients (30), and traditional herbal remedies are common among Chinese patients (31,32). However, many of these commonly used modalities were deemed to have insufficient evidence in the SIO-ASCO guideline. By contrast, acupuncture and massage, both of which are recommended in the guideline, are generally less widely used among these minoritized racial and ethnic groups (25). The mechanisms and inequities underlying these racial and ethnic disparities remain an active area of research and represent promising targets to promote better pain management in underserved cancer populations.

## Challenges and barriers to addressing racial and ethnic pain disparities through CIH approaches

Growing research has highlighted possible mechanisms and inequities that could explain the documented disparities in CIH use by cancer patients from minoritized groups. Many CIH approaches are not covered by insurance (33-35). Acupuncture has historically cost on average $94-$103 per visit (36,37), and more recent estimates indicate that the total annual amount paid for acupuncturist visits was a mean of $1022 (38). Further, research from the past 2 decades suggests that 75% of adults who used acupuncture had no insurance coverage for acupuncture (39), and the proportion of acupuncturist visits with any insurance coverage has increased marginally in recent years (38). Given that members of underserved racial and ethnic groups are more likely to have lower income and higher unemployment rates than White individuals because of entrenched structural and systemic racism (40), the high costs of many CIH approaches, along with the limited insurance coverage (34,38,39,41), could potentially explain why minoritized patients were found to be less likely to use acupuncture and more likely to use CIH approaches that are free, such as prayer and meditation (25,28,29). Indeed, higher income has been shown to be an important predictor of CIH use (42).

Besides affordability, the availability of CIH approaches may also contribute to racial and ethnic disparities. For example, yoga and acupuncture clinics tend to be concentrated in upper-income neighborhoods and less accessible in neighborhoods with lower income levels and historically underserved groups (43). One study found that the availability of acupuncture, meditation, yoga, and Tai Chi was statistically significantly lower in community hospitals serving lower-income populations compared with community hospitals serving middle-income populations (44). Of the estimated 38 000 licensed acupuncturists in the United States, nearly 50% are located in New York, California, and Florida, whereas states with a larger (>30%) Black population, such as Mississippi and Louisiana, have fewer than 2 acupuncturists per 100 000 people (45). To improve accessibility for underserved geographic regions, many cancer centers are leveraging technology to deliver interventions remotely (46). Although some CIH approaches (eg, yoga, meditation) can be implemented virtually, other modalities with strong evidence base for pain, such as acupuncture and massage, are not well suited for remote delivery, which further reduces access.

In addition to costs and availability of CIH services, the belief systems of cancer patients play an important role in racial and ethnic disparities. Minoritized patients tend to have lower expectations of benefits, greater perceived barriers, and more negative social norms regarding CIH use, all of which are associated with a lower likelihood of using CIH approaches (14,22,47,48). These beliefs reflect differences in lived experiences, which may be shaped by structural racism and other systemic issues that disproportionately disadvantage certain persons or communities (49). An often overlooked influence in the belief systems of patients is the paucity of CIH practitioners of color or other minoritized backgrounds. Although information on the racial and ethnic characteristics of acupuncturists and other practitioners is limited, the available data suggest that CIH providers are disproportionately White (45,50). Patients of color may face more difficulties communicating and establishing rapport with White providers who do not come from similar backgrounds; indeed, emerging perspectives suggest these lower-quality patient–provider interactions could negatively shape expectations and beliefs surrounding CIH approaches and contribute to lower likelihood of seeking these therapies (51-53).

Just as limited diversity of CIH practitioners exacerbates racial and ethnic disparities, underrepresentation of minoritized communities in clinical research is also a key contributor. Lack of diverse participants is a major limitation of many trials of CIH approaches to cancer pain management (54). For example, the use of acupuncture for aromatase inhibitor–related joint pain received the strongest level of recommendation in the SIO-ASCO guideline (9). However, a large trial that contributed to the evidence base for this recommendation had limited representation from various racial and ethnic groups (5% Black, 7% Asian, and 9% Hispanic and Latino) (55). This underrepresentation is not unique to acupuncture research. In a recent Cochrane review of music therapy (81 trials with n = 5576 cancer patients), only 10% of trial participants were identified as Black and 6% as Latino, and most trials failed to report racial demographic information (56). More diverse inclusion in clinical trials of all CIH modalities is a critical next step to promoting greater equity in cancer pain management (57).

Finally, it is unlikely that a one-size-fits-all approach is sufficient to address racial and ethnic pain disparities in oncology (57). Acupuncture has a robust evidence base for cancer pain management relative to most other CIH approaches, but it may not be the optimal treatment option for all cancer patients with pain. Other modalities may have stronger cultural resonance with certain persons or communities and therefore have greater potential for acceptability and uptake in real-world settings. For example, ethnographic and phylogenetic research has identified music as a defining characteristic of humankind across various cultures and societies around the world (58,59). These findings highlight the unique potential of music therapy to appeal to diverse cancer populations; however, evidence of its effectiveness in cancer pain management remains insufficient to recommend its use. This is also true for other CIH modalities (eg, prayer) commonly used by minoritized racial and ethnic groups (9). There remains a critical need for more research into culturally attuned interventions, including optimal strategies for adapting existing evidence-based treatments for diverse cancer populations.

Taken together, the above factors—high costs and the lack of insurance coverage for many CIH approaches, the limited diversity and availability of CIH providers, the negative expectancy and social norms surrounding CIH use, the underrepresentation of various racial and ethnic groups in the clinical research of CIH, and the paucity of culturally attuned interventions tailored to diverse individuals—represent key barriers that must be addressed to promote equitable cancer pain management through the CIH approaches discussed in the SIO-ASCO guideline.

## Future directions and opportunities to address racial and ethnic pain disparities through CIH approaches

To date, most efforts to promote greater use and accessibility of CIH have focused on insurance policy and reimbursement. Driven in part by the opioid crisis, organizations such as the American Medical Association and the National Association of Attorneys General have called for broader insurance coverage of nonpharmacological therapies, such as acupuncture and other CIH approaches (60-62). These efforts, coupled with the growing evidence base of acupuncture, led to the recent decision by the Centers for Medicare and Medicaid Services to cover acupuncture for Medicare patients with chronic low back pain (63). Although this decision represents a promising step, further action is needed to translate greater insurance coverage of acupuncture into equitable and sustainable access for diverse cancer patients (64). Indeed, research suggests that minoritized cancer patients are half as willing as White patients to use acupuncture if treatments are covered by insurance (22). Aside from lack of previous experience with acupuncture because of cost, another possible explanation for this finding is that minoritized patients tend to have lower-quality health insurance and greater propensity to lose their existing insurance (65). These factors could make them hesitant to commit to insurance-covered treatments such as acupuncture, which often require multiple follow-up visits for effectiveness (66) and contribute to large out-of-pocket expenses for patients with high-deductible plans (38). Insurance policy reform is also needed for other modalities (eg, massage, hypnosis) that are currently recommended for pain management but not widely covered. Insurers and funders have historically cited the limited evidence base of CIH approaches as one of the main rationales behind lack of coverage (35,38). However, the publication of SIO-ASCO guidelines, with its updated review of the evidence, offers a timely opportunity to revisit these insurance coverage decisions. Centers for Medicare and Medicaid Services and insurers should consider expanding coverage to evidence-based CIH approaches that have demonstrated effectiveness for pain.

Given that insurance coverage is disproportionately lower among underserved groups, efforts to expand access must go beyond insurance policy and reimbursement. An active area of research is the investigation of novel care delivery models to reduce costs and increase access to CIH approaches. Group-based acupuncture, also known as community acupuncture, has a low-cost fee structure that results in lower out-of-pocket expenses for patients without relying on insurance reimbursements (67). In this model, providers treat patients simultaneously in a communal space, and appointments are often staggered only 10-15 minutes apart to facilitate scheduling and accommodate more patients; because of the higher clinical volume, group-based acupuncture clinics are typically able to provide services based on a sliding-scale fee (67). This model has demonstrated feasibility and a high level of acceptability among minoritized patients (68-71). Further, in a randomized trial of cancer patients with pain, group-based acupuncture produced greater pain relief and was delivered at lower cost compared with conventional acupuncture (72). Despite this promising evidence, the pain outcomes achieved with this care model have not been consistent across studies. In a large pragmatic trial of racially and ethnically diverse, medically underserved patients with chronic pain from noncancer causes, group-based acupuncture was not as effective as conventional acupuncture, and response rates for clinically meaningful pain reduction were lower relative to other acupuncture trials for pain (73).

Similarly, integrative medicine group visits, which include a variety of CIH approaches for pain management (ie, mindfulness-based techniques, acupressure, massage, nutrition), have also demonstrated feasibility and acceptability for diverse, low-income populations (74); however, the findings from a randomized trial demonstrated that the group visits did not provide benefit for pain relative to usual care (75). Taken together, the mixed findings of group-based delivery models highlight the need for additional research that strikes a delicate balance between promoting acceptability, accessibility, and adoption among diverse, underserved populations while preserving the effectiveness of CIH approaches in underresourced settings. Hybrid effectiveness–implementation study designs could play an important role in finding solutions (76).

Besides group-based formats, another promising care delivery model to expand access is the use of telehealth services, which expanded rapidly during the COVID-19 pandemic (77). Many CIH approaches have demonstrated the capacity for virtual delivery (78,79), and preliminary research suggests this may increase accessibility for racial and ethnic groups who live in neighborhoods that historically lacked CIH options (80,81). Indeed, a large proportion of cancer patients prefer to seek CIH services closer to home (82). However, some modalities are not suitable for virtual delivery (eg, acupuncture) and must be adapted in creative ways to allow for remote administration (eg, educating patients on self-acupressure through telehealth). Despite growing research in this area (78,80,83,84,85,86), rigorous large trials of virtually delivered CIH approaches are still lacking (87). Future studies in this area will need to be mindful of disparities in digital literacy and access to avoid exacerbating current unmet needs (88).

In addition to reducing costs through health policy and group-based or virtual delivery models, other strategies to increase access have focused on expanding the workforce of CIH providers. Although this type of strategy has not been widely implemented in oncology, similar efforts for other populations may provide a useful model. For example, in 2013, the Department of Defense established Acupuncture Training Across Clinical Settings (ATACS) to address unmet pain management needs among veterans (89). To promote scalability and access, ATACS taught Veterans Administration health-care providers how to deliver an adapted, standardized acupuncture protocol involving only points in the ears (89). Within 3 years, ATACS successfully trained more than 2700 providers. A large, randomized controlled trial (n = 360 cancer survivors) demonstrated that this auricular acupuncture protocol was inferior to conventional, full-body electro-acupuncture but more effective than usual care (90). Thus, in oncology settings where conventional acupuncture is not available, this auricular acupuncture protocol could potentially be taught to a nonacupuncturist workforce to expand nonpharmacological treatment options for cancer patients with pain. Similar standardized auricular acupuncture models (eg, National Acupuncture Detoxification Association protocol) have been implemented in other settings (eg, substance abuse, mental health, disaster relief) (91) and have demonstrated preliminary evidence of benefit for cancer patients (92). However, rigorous trials of these auricular acupuncture protocols for cancer pain management are still needed.

Any strategy targeting the workforce must also address the critical shortage of CIH practitioners from minoritized racial and ethnic groups and underserved communities. Existing educational programs in integrative medicine represent a logical

starting point for establishing career development resources and mentorship structures to attract and cultivate a more diverse workforce of CIH practitioners (93). Collaborations with professional organizations, such as the Black Acupuncturist Association, the Latin American Music Therapy Network, and the Black Music Therapy Network, Inc, may also help strengthen support networks for aspiring CIH practitioners of color.

Because endorsement from community members is a key predictor of CIH use (47), the increased presence of CIH practitioners from minoritized and underserved backgrounds could potentially promote more positive social norms about CIH in their respective communities and lead to greater uptake of these therapies. Knowledge and awareness of CIH are also associated with higher likelihood of using these approaches (47), so more research is needed on other effective modes of information dissemination. One study, for example, found that minoritized patients prefer to receive information about yoga by smartphone (94). Another study of predominantly Black cancer patients showed that the majority wanted their primary oncologist to provide information about CIH approaches for managing pain and other symptoms (28). However, in interviews with providers and other clinical stakeholders at an academic cancer center, many expressed a lack of knowledge about the evidence base of CIH approaches (82). Previous estimates indicate that half of medical schools in the United States do not include curricula on CIH approaches, suggesting that most physicians may be poorly equipped to properly counsel patients about CIH approaches for pain management (95). Educating medical trainees about CIH is a potential intervention and does not necessarily require a major overhaul of medical curricula. Indeed, the guiding principles of integrative medicine (96,97)—its biopsychosocial framework, centrality of the doctor–patient relationship, emphasis on wellness and prevention, interprofessional collaboration, and cultural competence and inclusiveness—align closely with the core competencies of the modern medical curriculum (98,99). Training in CIH approaches will help prepare future oncology providers to counsel patients on evidence-based pain management options and equip them with more tools to address racial and ethnic pain disparities (100-102).

Educating patients and providers about CIH will go a long way toward increasing clinical trial participation among underrepresented patients (103,104). Inclusion of patient and caregiver stakeholders in the design and implementation of studies, including recruitment strategies, may also help improve diverse representation in clinical research (105). Because CIH approaches may be less familiar to patients, conventional recruitment and outreach methods may not be sufficient. Research has begun to examine which recruitment strategies are most effective for enrolling specific underrepresented groups for CIH research (106). Additional studies like these are needed to develop more targeted and data-driven approaches to enhancing diversity in clinical trials.

Finally, to make meaningful progress toward equitable cancer pain management, research needs to shift from a one-size-fits-all paradigm toward a broader array of culturally attuned interventions that can be tailored to individuals and communities of diverse backgrounds (57). Informed by culturally relevant traditions, such as African American churches, emerging research has investigated how to tailor music therapy interventions to address pain in Black noncancer populations (107,108). More recently, this line of investigation has been extended to Black cancer populations. In a retrospective study of Black and White hospitalized cancer patients who received music therapy during their routine inpatient care, both Black and White patients achieved clinically meaningful pain reduction of similar magnitude with music therapy (109); this stands in contrast to prior research of pain interventions that demonstrated only minimal or smaller responses among Black patients compared with their White counterparts (110,111). Furthermore, Black patients engaged more actively with music, and their providers referred them more frequently to music therapy for pain (109), suggesting that music therapy may not be associated with the same barriers and biases that impede conventional pharmacological treatments (112,113). Although pain reduction with music therapy was similar among Black and White cancer patients, this clinical outcome was achieved through varying approaches: spirituality and self-expression were more common themes in the music therapy sessions with Black patients, whereas family bonds and relaxation were more commonly documented among White patients (109). These preliminary findings can inform how to culturally tailor other CIH interventions to achieve equitable health outcomes.

At its core, integrative medicine is an inclusive paradigm that draws from a range of modalities from different healing traditions to promote patient-centered care (8,96). Future research of CIH approaches should embrace these culturally diverse roots to develop innovative solutions for reducing pain care disparities in oncology.

## Data availability

No new data were generated or analyzed in support of this research.

## Author contributions

Kevin T. Liou, MD (Conceptualization; Project administration; Writing—original draft; Writing—review & editing), Rebecca Ashare, PhD (Writing—review & editing), Brooke Worster, MD (Writing – review & editing), Katie F. Jones, PhD (Writing – review & editing), Katherine A. Yeager, PhD (Writing – review & editing), Amanda M. Acevedo, PhD (Supervision; Writing – review & editing), Rebecca Ferrer, PhD (Supervision; Writing – review & editing), and Salimah H. Meghani, PhD, MBE (Conceptualization; Supervision; Writing – review & editing).

## Funding

This work was supported by the National Cancer Institute at the National Institutes of Health (K08CA266927 to K.T.L). This work is part of a white paper, "Mechanisms Associated with Inequities in Cancer Pain Management," commissioned by the National Cancer Institute (75N91021P00721 to S.H.M.).

## Conflicts of interest

The authors declare no relevant conflicts of interest.

## Acknowledgements

Funds from the National Cancer Institute (NCI) were used to convene experts to develop a white paper that partially informed the manuscript's scientific scope. NCI staff contributed to the design of the white paper, the writing of the manuscript, and the decision to submit the manuscript for publication. The manuscript

was reviewed and approved for submission through the NCI Division of Cancer Control and Population Sciences manuscript clearance process.

## References


1. Zylla D, Steele G, Gupta P. A systematic review of the impact of pain on overall survival in patients with cancer. *Support Care Cancer*. 2017;25(5):1687-1698. doi:10.1007/s00520-017-3614-y.
2. Greco MT, Roberto A, Corli O, et al. Quality of cancer pain management: an update of a systematic review of undertreatment of patients with cancer. *J Clin Oncol* 2014;32(36):4149-4154. doi: 10.1200/jco.2014.56.0383.
3. Roberto A, Greco MT, Uggeri S, et al. Living systematic review to assess the analgesic undertreatment in cancer patients. *Pain Pract*. 2022;22(4):487-496. doi:10.1111/papr.13098.
4. Cleeland CS, Gonin R, Baez L, Loehrer P, Pandya KJ. Pain and treatment of pain in minority patients with cancer. The Eastern Cooperative Oncology Group Minority Outpatient Pain Study. *Ann Intern Med*. 1997;127(9):813-816. doi: 10.7326/0003-4819-127-9-199711010-00006.
5. Fisch MJ, Lee JW, Weiss M, et al. Prospective, observational study of pain and analgesic prescribing in medical oncology outpatients with breast, colorectal, lung, or prostate cancer. *J Clin Oncol*. 2012;30(16):1980-1988. doi:10.1200/jco.2011.39.2381.
6. Scarborough BM, Smith CB. Optimal pain management for patients with cancer in the modern era. *CA Cancer J Clin*. 2018; 68(3):182-196. doi:10.3322/caac.21453.
7. National Center for Complementary and Integrative Health. *NCCIH Strategic Plan FY 2021–2025: Mapping the Pathway to Research on Whole Person Health*. National Center for Complementary and Integrative Health. https://nccih.nih.gov/about/nccih-strategic-plan-2021-2025. Accessed February 20, 2022.
8. Mao JJ, Pillai GG, Andrade CJ, et al. Integrative oncology: addressing the global challenges of cancer prevention and treatment. *CA Cancer J Clin* 2022;72(2):144-164. doi: 10.3322/caac.21706.
9. Mao JJ, Ismaila N, Bao T, et al. Integrative medicine for pain management in oncology: Society for Integrative Oncology-ASCO guideline. *J Clin Oncol* 2022;40(34):3998-4024. doi: 10.1200/jco.22.01357.
10. Greenlee H, DuPont-Reyes MJ, Balneaves LG, 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(3):194-232. doi:10.3322/caac.21397.
11. Lyman GH, Bohlke K, Cohen L. Integrative therapies during and after breast cancer treatment: ASCO endorsement of the SIO clinical practice guideline summary. *J Oncol Pract*. 2018; 14(8):495-499. doi:10.1200/JOP.18.00283.
12. Swarm RA, Paice JA, Anghelescu DL, et al. BCPS adult cancer pain, version 3.2019, NCCN clinical practice guidelines in oncology. *J Natl Compr Cancer Netw*. 2019;17(8):977-1007. doi: 10.6004/jnccn.2019.0038.
13. Ludwick A, Corey K, Meghani S. Racial and socioeconomic factors associated with the use of complementary and alternative modalities for pain in cancer outpatients: an integrative review. *Pain Manag Nurs*. 2020;21(2):142-150. doi: 10.1016/j.pmn.2019.08.005.
14. Liou KT, Trevino KM, Meghani SH, et al. Fear of analgesic side effects predicts preference for acupuncture: a cross-sectional study of cancer patients with pain in the USA. *Support Care Cancer*. 2021;29(1):427-435. doi:10.1007/s00520-020-05504-y.
15. Bauml J, Langer CJ, Evans T, Garland SN, Desai K, Mao JJ. Does perceived control predict Complementary and Alternative Medicine (CAM) use among patients with lung cancer? A cross-sectional survey. *Support Care Cancer*. 2014;22(9):2465-2472. doi: 10.1007/s00520-014-2220-5.
16. Hamilton AS, Miller MF, Arora NK, Bellizzi KM, Rowland JH. Predictors of use of complementary and alternative medicine by non-Hodgkin lymphoma survivors and relationship to quality of life. *Integr Cancer Ther*. 2013;12(3):225-235. doi: 10.1177/1534735412449733.
17. Sohl SJ, Weaver KE, Birdee G, Kent EE, Danhauer SC, Hamilton AS. Characteristics associated with the use of complementary health approaches among long-term cancer survivors. *Support Care Cancer*. 2014;22(4):927-936. doi: 10.1007/s00520-013-2040-z.
18. Stein KD, Kaw C, Crammer C, Gansler T. The role of psychological functioning in the use of complementary and alternative methods among disease-free colorectal cancer survivors: a report from the American Cancer Society's studies of cancer survivors. *Cancer*. 2009;115(suppl 18):4397-4408. doi: 10.1002/cncr.24591.
19. Fouladbakhsh JM, Stommel M. Gender, symptom experience, and use of complementary and alternative medicine practices among cancer survivors in the U.S. cancer population. *Oncol Nurs Forum*. 2010;37(1):E7-E15. doi:10.1188/10.Onf.E7-e15.
20. Frankel E, Garland S, Meghani SH, Vapiwala N, Mao JJ. Patients' perspectives on integrating acupuncture into the radiation oncology setting. *Eur J Integr Med*. 2014;6(5):532-537. doi: 10.1016/j.eujim.2014.06.007.
21. Desai K, Bao T, Li QS, et al. Understanding interest, barriers, and preferences related to yoga practice among cancer survivors. *Support Care Cancer*. 2021;29(9):5313-5321. doi: 10.1007/s00520-021-06083-2.
22. Liou KT, Hung TKW, Meghani SH, et al. What if acupuncture were covered by insurance for pain management? A cross-sectional study of cancer patients at one academic center and 11 community hospitals. *Pain Med*. 2019;20(10):2060-2068. doi: 10.1093/pm/pnz087.
23. Gansler T, Kaw C, Crammer C, Smith T. A population-based study of prevalence of complementary methods use by cancer survivors: a report from the American Cancer Society's studies of cancer survivors. *Cancer*. 2008;113(5):1048-1057. doi: 10.1002/cncr.23659.
24. Jones D, Cohen L, Rieber AG, et al. Complementary and alternative medicine use in minority and medically underserved oncology patients: assessment and implications. *Integr Cancer Ther*. 2018;17(2):371-379. doi:10.1177/1534735417735892.
25. Judson PL, Abdallah R, Xiong Y, Ebbert J, Lancaster JM. Complementary and alternative medicine use in individuals presenting for care at a comprehensive cancer center. *Integr Cancer Ther*. 2017;16(1):96-103. doi:10.1177/1534735416660384.
26. McDermott CL, Blough DK, Fedorenko CR, et al. Complementary and alternative medicine use among newly diagnosed prostate cancer patients. *Support Care Cancer*. 2012; 20(1):65-73. doi:10.1007/s00520-010-1055-y.
27. Rosen JE, Gardiner P, Saper RB, et al. Complementary and alternative medicine use among patients with thyroid cancer. *Thyroid*. 2013;23(10):1238-1246. doi:10.1089/thy.2012.0495.
28. Bari S, Chineke I, Darwin A, et al. Awareness, use and outlook of complementary and alternative medicine (CAM) options in an underserved, uninsured minority cancer patient population. *Integr Cancer Ther*. 2021;20:15347354211051622. doi: 10.1177/15347354211051622.

29. Jones RA, Taylor AG, Bourguignon C, et al. Complementary and alternative medicine modality use and beliefs among African American prostate cancer survivors. *Oncol Nurs Forum* 2007; 34(2):359-364. doi:10.1188/07.Onf.359-364.
30. Owens B, Jackson M, Berndt A. Complementary therapy used by Hispanic women during treatment for breast cancer. *J Holist Nurs*. 2009;27(3):167-176. doi:10.1177/0898010108330801.
31. Barrett M, Huang P, Chu A, Chen J, Dhingra L. Complementary and alternative medicine approaches for pain in underserved Chinese-American cancer patients: prevalence and correlates. *J Pain Symptom Manage*. 2016;51(4):e1-e3. doi:10.1016/j.jpainsymman.2016.01.002.
32. Wong-Kim E, Merighi JR. Complementary and alternative medicine for pain management in U.S.- and foreign-born Chinese women with breast cancer. *J Health Care Poor Underserved*. 2007; 18(suppl 4):118-129. doi:10.1353/hpu.2007.0123.
33. Whedon JM, Bezdjian S, Goehl JM, Kazal LA. Trends in insurance coverage for complementary health care services. *J Alternat Complement Med (New York, NY)*. 2020;26(10):966-969. doi:10.1089/acm.2020.0078.
34. Bonakdar R, Palanker D, Sweeney MM. Analysis of state insurance coverage for nonpharmacologic treatment of low back pain as recommended by the American College of Physicians Guidelines. *Glob Adv Health Med*. 2019;8:2164956119855629. doi: 10.1177/2164956119855629.
35. Bleck R, Marquez E, Gold MA, Westhoff CL. A scoping review of acupuncture insurance coverage in the United States. *Acupunct Med*. 2021;39(5):461-470. doi:10.1177/0964528420964214.
36. Austin S, Ramamonjiarivelo Z, Qu H, Ellis-Griffith G. Acupuncture use in the United States: who, where, why, and at what price? *Health Mark Q*. 2015;32(2):113-128. doi: 10.1080/07359683.2015.1033929.
37. Zhang Y, Lao L, Chen H, Ceballos R. Acupuncture use among American adults: what acupuncture practitioners can learn from national health interview survey 2007? *Evid-Based Complement Alternat Med ECAM*. 2012;2012:710750. doi: 10.1155/2012/710750.
38. Candon M, Nielsen A, Dusek JA. Trends in insurance coverage for acupuncture, 2010-2019. *JAMA Netw Open*. 2022;5(1): e2142509. doi:10.1001/jamanetworkopen.2021.42509.
39. Nahin RL, Barnes PM, Stussman BJ. Insurance coverage for complementary health approaches among adult users: United States, 2002 and 2012. *NCHS Data Brief*. 2016;(235):1-8.
40. Meghani SH, Chittams J. Controlling for socioeconomic status in pain disparities research: all-else-equal analysis when "all else" is not equal. *Pain Med*. 2015;16(12):2222-2225. doi: 10.1111/pme.12829.
41. Miccio RS, Cowen VS. A regional analysis of U.S. insurance reimbursement guidelines for massage therapy. *Int J Ther Massage Bodywork*. 2018;11(1):11-16.
42. Nahin RL, Dahlhamer JM, Taylor BL, et al. Health behaviors and risk factors in those who use complementary and alternative medicine. *BMC Public Health* 2007;7:217. doi: 10.1186/1471-2458-7-217.
43. Saper R. Integrative medicine and health disparities. *Glob Adv Health Med*. 2016;5(1):5-8. doi:10.7453/gahmj.2015.133.
44. Desai K, Liou K, Liang K, Seluzicki C, Mao JJ. Availability of integrative medicine therapies at National Cancer Institute-designated comprehensive cancer centers and community hospitals. *J Alternat Complement Med (New York, NY)*. 2021; 27(11):1011-1013. doi:10.1089/acm.2021.0102.
45. Fan AY, Stumpf SH, Faggert Alemi S, Matecki A. Distribution of licensed acupuncturists and educational institutions in the United States at the start of 2018. *Complement Ther Med*. 2018; 41:295-301. doi:10.1016/j.ctim.2018.10.015.
46. Harris J, Cheevers K, Armes J. The emerging role of digital health in monitoring and supporting people living with cancer and the consequences of its treatments. *Curr Opin Support Palliat Care*. 2018;12(3):268-275. doi: 10.1097/spc.0000000000000362.
47. Bauml JM, Chokshi S, Schapira MM, et al. Do attitudes and beliefs regarding complementary and alternative medicine impact its use among patients with cancer? A cross-sectional survey. *Cancer*. 2015;121(14):2431-2438. doi:10.1002/cncr.29173.
48. Bao T, Li SQ, Dearing JL, et al. Acupuncture versus medication for pain management: a cross-sectional study of breast cancer survivors. *Acupunct Med*. 2018;36(2):80-87. doi: 10.1136/acupmed-2017-011435.
49. Ford CL, Airhihenbuwa CO. Critical Race Theory, race equity, and public health: toward antiracism praxis. *Am J Public Health*. 2010;100(suppl 1):S30-S35. doi:10.2105/ajph.2009.171058.
50. American Music Therapy Association. *2021 AMTA Workforce Analysis: A Descriptive Statistical Profile of the AMTA Membership*. December 13, 2021. https://www.musictherapy.org/assets/1/7/2021_Workforce_Analysis_final.pdf. Accessed November 28, 2022.
51. Friesen P, Blease C. Placebo effects and racial and ethnic health disparities: an unjust and underexplored connection. *J Med Ethics*. 2018;44(11):774-781. doi: 10.1136/medethics-2018-104811.
52. Atlas LY. A social affective neuroscience lens on placebo analgesia. *Trends Cogn Sci*. 2021;25(11):992-1005. doi: 10.1016/j.tics.2021.07.016.
53. Yetman HE, Cox N, Adler SR, Hall KT, Stone VE. What do placebo and nocebo effects have to do with health equity? The hidden toll of nocebo effects on racial and ethnic minority patients in clinical care. *Front Psychol*. 2021;12:788230. doi: 10.3389/fpsyg.2021.788230.
54. Zia FZ, Olaku O, Bao T, et al. The National Cancer Institute's conference on acupuncture for symptom management in oncology: state of the science, evidence, and research gaps. *J Natl Cancer Insti Monogr*.2017;2017(52):lgx005. doi:10.1093/jncimonographs/lgx005.
55. Hershman DL, Unger JM, Greenlee H, et al. Effect of acupuncture vs sham acupuncture or waitlist control on joint pain related to aromatase inhibitors among women with early-stage breast cancer: a randomized clinical trial. *JAMA*. 2018; 320(2):167-176. doi:10.1001/jama.2018.8907.
56. Bradt J, Dileo C, Myers-Coffman K, et al. Music interventions for improving psychological and physical outcomes in people with cancer. *Cochrane Database Syst Rev*. 2021;10(10):CD006911. doi:10.1002/14651858.CD006911.pub4.P
57. Crombez P, Bron D, Michiels S. Multicultural approaches of cancer pain. *Curr Opin Oncol*. 2019;31(4):268-274. doi: 10.1097/cco.0000000000000547.
58. Mehr SA, Singh M, Knox D, et al. Universality and diversity in human song. *Science (New York, NY)*. 2019;366(6468):eaax0868. doi:10.1126/science.aax0868.
59. Savage PE, Brown S, Sakai E, Currie TE. Statistical universals reveal the structures and functions of human music. *Proc Natl Acad Sci USA*. 2015;112(29):8987-8992. doi: 10.1073/pnas.1414495112.
60. Weeks J. Influential U.S. medical organizations call for insurance coverage of non-pharmacologic approaches to pain. *J Alternat Complement Med (New York, NY)*. 2016;22(12):947-949. doi:10.1089/acm.2016.29016.jjw.

61. National Association of Attorneys General. *Joint Letter to America's Health Insurance Plans Re: Prescription Opioid Epidemic*. September 18, 2017. https://www.naag.org/press-releases/attorneys-general-urge-health-insurance-companies-to-reduce-provider-incentives-for-prescribing-pain-killers/. Accessed August 23, 2018.
62. Mao JJ, Davis RT, Coeytaux R, et al. Acupuncture for chronic low back pain: recommendations to Medicare/Medicaid from the Society for Acupuncture Research. *J Alternat Complement Med (New York, NY)*. 2019;25(4):367-369. doi:10.1089/acm.2019.29067.jjm.
63. Centers for Medicare & Medicaid Services. CMS finalizes decision to cover acupuncture for chronic low back pain for Medicare beneficiaries. 2020. https://www.cms.gov/newsroom/press-releases/cms-finalizes-decision-cover-acupuncture-chronic-low-back-pain-medicare-beneficiaries. Accessed January 21, 2020.
64. Liou KT, Korenstein D, Mao JJ. Medicare coverage of acupuncture for chronic low back pain: does it move the needle on the opioid crisis? *J Gen Intern Med*. 2021;36(2):527-529. doi:10.1007/s11606-020-05871-6.
65. Sohn H. Racial and ethnic disparities in health insurance coverage: dynamics of gaining and losing coverage over the lifecourse. *Popul Res Policy Rev*. 2017;36(2):181-201. doi:10.1007/s11113-016-9416-y.
66. Schwehr NA, Shippee ND, Johnson PJ. Acupuncture 'dose' (number of treatments) and insurance benefits in the USA. *Acupunct Med*. 2018;36(2):88-95. doi:10.1136/acupmed-2016-011341.
67. Chao MT, Tippens KM, Connelly E. Utilization of group-based, community acupuncture clinics: a comparative study with a nationally representative sample of acupuncture users. *J Alternat Complement Med (New York, NY)*. 2012;18(6):561-566. doi:10.1089/acm.2011.0128.
68. Chuang E, Hashai N, Buonora M, Gabison J, Kligler B, McKee MD. "It's better in a group anyway": patient experiences of group and individual acupuncture. *J Alternat Complement Med (New York, NY)*. 2018;24(4):336-342. doi:10.1089/acm.2017.0262.
69. Kligler B, Buonora M, Gabison J, Jacobs E, Karasz A, McKee MD. "I felt like it was God's hands putting the needles in": a qualitative analysis of the experience of acupuncture for chronic pain in a low-income, ethnically diverse, and medically underserved patient population. *J Alternat Complement Med (New York, NY)*. 2015;21(11):713-719. doi:10.1089/acm.2014.0376.
70. McKee MD, Kligler B, Blank AE, et al. The ADDOPT study (Acupuncture to Decrease Disparities in Outcomes of Pain Treatment): feasibility of offering acupuncture in the community health center setting. *J Alternat Complement Med (New York, NY)*. 2012;18(9):839-843. doi:10.1089/acm.2011.0193.
71. McKee MD, Kligler B, Fletcher J, et al. Outcomes of acupuncture for chronic pain in urban primary care. *J Am Board Fam Med* 2013;26(6):692-700. doi:10.3122/jabfm.2013.06.130003.
72. Oberoi DV, Longo CJ, Reed EN, Landmann J, Piedalue KL, Carlson LE. Cost-utility of group versus individual acupuncture for cancer-related pain using quality-adjusted life years in a noninferiority trial. *J Alternat Complement Med (New York, NY)*. 2021;27(5):390-397. doi:10.1089/acm.2020.0386.
73. McKee MD, Nielsen A, Anderson B, et al. Individual vs. group delivery of acupuncture therapy for chronic musculoskeletal pain in urban primary care-a randomized trial. *J Gen Intern Med* 2020;35(4):1227-1237. doi:10.1007/s11606-019-05583-6.
74. Thompson-Lastad A, Gardiner P, Chao MT. Integrative group medical visits: a national scoping survey of safety-net clinics. *Health Equity*. 2019;3(1):1-8. doi:10.1089/heq.2018.0081.
75. Gardiner P, Luo M, D'Amico S, et al. Effectiveness of integrative medicine group visits in chronic pain and depressive symptoms: a randomized controlled trial. *PLoS One* 2019;14(12):e0225540. doi:10.1371/journal.pone.0225540.
76. Curran GM, Bauer M, Mittman B, Pyne JM, Stetler C. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care*. 2012;50(3):217-226. doi:10.1097/MLR.0b013e3182408812.
77. Ramaswamy A, Yu M, Drangsholt S, et al. Patient satisfaction with telemedicine during the COVID-19 pandemic: a retrospective cohort study. *J Med Internet Res* 2020;22(9):e20786. doi:10.2196/20786.
78. Knoerl R, Phillips CS, Berfield J, et al. Lessons learned from the delivery of virtual integrative oncology interventions in clinical practice and research during the COVID-19 pandemic. *Support Care Cancer* 2021;29(8):4191-4194. doi:10.1007/s00520-021-06174-0.
79. Trevino KM, Raghunathan N, Latte-Naor S, et al. Rapid deployment of virtual mind-body interventions during the COVID-19 outbreak: feasibility, acceptability, and implications for future care. *Support Care Cancer*. 2021;29(2):543-546. doi:10.1007/s00520-020-05740-2.
80. Narayanan S, Lopez G, Powers-James C, et al. Integrative oncology consultations delivered via telehealth in 2020 and in-person in 2019: paradigm shift during the COVID-19 world pandemic. *Integr Cancer Ther*. 2021;20:1534735421999101. doi:10.1177/1534735421999101.
81. Campos-Castillo C, Anthony D. Racial and ethnic differences in self-reported telehealth use during the COVID-19 pandemic: a secondary analysis of a US survey of internet users from late March. *J Am Med Inform Assoc*. 2021;28(1):119-125. doi:10.1093/jamia/ocaa221.
82. Mascaro JS, Catic A, Srivastava M, et al. Examination of provider and patient knowledge, beliefs, and preferences in integrative oncology at a National Cancer Institute-designated comprehensive cancer center. *Integr Med Rep* 2022;1(1):66-75. doi:10.1089/imr.2021.0004.
83. Folsom S, Christie AJ, Cohen L, Lopez G. Implementing telehealth music therapy services in an integrative oncology setting: a case series. *Integr Cancer Ther*. 2021;20:15347354211053647. doi:10.1177/15347354211053647.
84. Gomaa S, West C, Lopez AM, et al. A telehealth-delivered tai chi intervention (TaiChi4Joint) for managing aromatase inhibitor-induced arthralgia in patients with breast cancer during COVID-19: longitudinal pilot study. *JMIR Form Res* 2022;6(6):e34995. doi:10.2196/34995.
85. Narayanan S, Lopez G, Liu W, Cohen A, Cohen L. The use of mobile-technologies to deliver integrative medicine during and beyond the COVID-19 world pandemic. *Glob Adv Health Med*. 2020;9:2164956120977437. doi:10.1177/2164956120977437.
86. Knoerl R, Bockhoff J, Fox E, et al. Cancer survivors' perspectives of virtual yoga for chronic chemotherapy-induced peripheral neuropathy pain during the COVID-19 pandemic. *Comput Inform Nurs* 2022;40(9):641-647. doi:10.1097/cin.0000000000000937.
87. Ben-Arye E, Paller CJ, Lopez AM, et al. The Society for Integrative Oncology practice recommendations for online consultation and treatment during the COVID-19 pandemic. *Support Care Cancer* 2021;29(10):6155-6165. doi:10.1007/s00520-021-06205-w.

88. Roberts ET, Mehrotra A. Assessment of disparities in digital access among Medicare beneficiaries and implications for telemedicine. *JAMA Intern Med*. 2020;180(10):1386. doi: 10.1001/jamainternmed.2020.2666.
89. Niemtzow R, Baxter J, Gallagher RM, et al. Building capacity for complementary and integrative medicine through a large, cross-agency, acupuncture training program: lessons learned from a military health system and Veterans Health Administration Joint Initiative Project. *Mil Med*. 2018; 183(11-12):e486-e93. doi:10.1093/milmed/usy028.
90. Mao JJ, Liou KT, Baser RE, et al. Effectiveness of electroacupuncture or auricular acupuncture vs usual care for chronic musculoskeletal pain among cancer survivors: the PEACE randomized clinical trial. *JAMA Oncol* 2021;7(5):720-727. doi: 10.1001/jamaoncol.2021.0310.
91. Stuyt EB, Voyles CA. The National Acupuncture Detoxification Association protocol, auricular acupuncture to support patients with substance abuse and behavioral health disorders: current perspectives. *Subst Abuse Rehabil*. 2016;7:169-180. doi:10.2147/sar.S99161.
92. de Valois B, Young T, Thorpe P, Degun T, Corbishley K. Acupuncture in the real world: evaluating a 15-year NADA auricular acupuncture service for breast cancer survivors experiencing hot flushes and night sweats as a consequence of adjuvant hormonal therapies. *Support Care Cancer*. 2022;30(6): 5063-5074. doi:10.1007/s00520-022-06898-7.
93. Zick SM, Czuhajewski C, Fouladbakhsh JM, et al. Integrative Oncology Scholars Program: a model for integrative oncology education. *J Alternat Complement Med (New York, NY)*. 2018; 24(9-10):1018-1022. doi:10.1089/acm.2018.0184.
94. Raghunathan NJ, Korenstein D, Li QS, Mao JJ. Awareness of yoga for supportive care in cancer: implications for dissemination. *J Alternat Complement Med (New York, NY)*. 2019;25(8): 809-813. doi:10.1089/acm.2018.0510.
95. Cowen VS, Cyr V. Complementary and alternative medicine in US medical schools. *Adv Med Educ Pract*. 2015;6:113-117. doi: 10.2147/amep.S69761.
96. Witt CM, Balneaves LG, Cardoso MJ, et al. A comprehensive definition for integrative oncology. *J Natl Cancer Inst Monogr*. 2017;2017(52):lgx012. doi:10.1093/jncimonographs/lgx012.
97. Bell IR, Caspi O, Schwartz GE, et al. Integrative medicine and systemic outcomes research: issues in the emergence of a new model for primary health care. *Arch Intern Med*. 2002;162(2): 133-140. doi:10.1001/archinte.162.2.133.
98. Kligler B, Maizes V, Schachter S, et al.; for the Education Working Group, Consortium of Academic Health Centers for Integrative Medicine. Core competencies in integrative medicine for medical school curricula: a proposal. *Acad Med* 2004; 79(6):521-531. doi:10.1097/00001888-200406000-00006.
99. Chow G, Liou KT, Heffron RC. Making whole: applying the principles of integrative medicine to medical education. *R I Med J (2013)*. 2016;99(3):16-19.
100. Witt CM. Training oncology physicians to advise their patients on complementary and integrative medicine. *J Alternat Complement Med (New York, NY)*. 2018;24(9-10):1016-1017. doi: 10.1089/acm.2018.0146.
101. Witt CM, Balneaves LG, Carlson LE, et al. Education competencies for integrative oncology-results of a systematic review and an international and interprofessional consensus procedure. *J Cancer Educ*. 2022;37(3):499-507. doi: 10.1007/s13187-020-01829-8.
102. Karim S, Benn R, Carlson LE, et al. Integrative oncology education: an emerging competency for oncology providers. *Curr Oncol* 2021;28(1):853-862. Epub 20210210. doi: 10.3390/curroncol28010084.
103. Mao JJ, Tan T, Li SQ, Meghani SH, Glanz K, Bruner D. Attitudes and barriers towards participation in an acupuncture trial among breast cancer patients: a survey study. *BMC Complement Altern Med*. 2014;14:7. doi: 10.1186/1472-6882-14-7.
104. Schapira MM, Mackenzie ER, Lam R, et al. Breast cancer survivors willingness to participate in an acupuncture clinical trial: a qualitative study. *Support Care Cancer*. 2014;22(5):1207-1215. doi:10.1007/s00520-013-2073-3.
105. Janevic MR, Mathur VA, Booker SQ, et al. Making pain research more inclusive: why and how. *J Pain*. 2022;23(5):707-728. doi: 10.1016/j.jpain.2021.10.004.
106. Gardiner P, Lestoquoy AS, Negash NL, et al. Lessons learned and strategies for recruitment of diverse, low-income patients into an integrative medical group visit clinical trial. *Explore (NY)*. 2019;15(3):215-221. doi:10.1016/j.explore.2019.01.003.
107. Bradt J, Potvin N, Kesslick A, et al. The impact of music therapy versus music medicine on psychological outcomes and pain in cancer patients: a mixed methods study. *Support Care Cancer* 2015;23(5):1261-1271. doi:10.1007/s00520-014-2478-7.
108. Low MY, Lacson C, Zhang F, Kesslick A, Bradt J. Vocal music therapy for chronic pain: a mixed methods feasibility study. *J Alternat Complement Med (New York, NY)*. 2020;26(2):113-122. doi:10.1089/acm.2019.0249.
109. Lichtl A, Casaw C, Edwards J, et al. Music therapy for pain in Black and White cancer patients: a retrospective study. *J Pain Symptom Manage*. 2022;64(5):478-485. doi:10.1016/j.jpainsymman.2022.07.007.
110. Hooten WM, Knight-Brown M, Townsend CO, Laures HJ. Clinical outcomes of multidisciplinary pain rehabilitation among African American compared with Caucasian patients with chronic pain. *Pain Med* 2012;13(11):1499-1508. doi: 10.1111/j.1526-4637.2012.01489.x.
111. Anderson KO, Mendoza TR, Payne R, et al. Pain education for underserved minority cancer patients: a randomized controlled trial. *J Clin Oncol* 2004;22(24):4918-4925. doi: 10.1200/jco.2004.06.115.
112. Hirsh AT, Anastas TM, Miller MM, Quinn PD, Kroenke K. Patient race and opioid misuse history influence provider risk perceptions for future opioid-related problems. *Am Psychol*. 2020;75(6):784-795.
113. Fiscella K, Epstein RM, Griggs JJ, Marshall MM, Shields CG. Is physician implicit bias associated with differences in care by patient race for metastatic cancer-related pain? *PLoS One*. 2021;16(10):e0257794.