Introduction
This topic brief focuses on the comparative effectiveness of complementary and alternative medicine (CAM)\(^1\) to reduce symptoms related to conventional cancer treatment among children in racial and ethnic minority groups, ages 0 to 18 years, with any type of cancer.

\(^1\) The National Center for Complementary and Alternative Medicine (NCCAM) defines CAM as a group of diverse medical and healthcare systems, practices, and products that are not generally considered part of conventional medicine. Conventional medicine (also called Western or allopathic medicine) is medicine as practiced by holders of M.D. (medical doctor) and D.O. (doctor of osteopathic medicine) degrees and by allied health professionals, such as physical therapists, psychologists, and registered nurses. The boundaries between CAM and conventional medicine are not absolute, and specific CAM practices may, over time, become widely accepted.\(^1\) Subgroups of CAM therapies are (1) biologically based therapies (e.g., herbals, supplements, special diets); (2) mind-body therapies (e.g., mindfulness, hypnosis, guided imagery); (3) manipulative and body-based therapies (e.g., massage); (4) energy therapies (e.g., acupuncture and Reiki); and (5) alternative medicine systems (e.g., traditional Chinese medicine, Ayurveda, homeopathy).

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Conventional medical treatments for childhood cancers include chemotherapy and radiation. Common short-term treatment–related symptoms include, but are not limited to, nausea, diarrhea, hair loss, fatigue, skin and weight changes, kidney problems, and anxiety.\(^2,3\) 

Information about the comparative effectiveness of CAM may help children with cancer and their caregivers make informed choices about options to reduce symptoms related to cancer treatment. It may also lead to improved outcomes that are important to children, their parents, and caregivers. In addition, increased knowledge about positive and negative interactions between CAM and conventional cancer therapies, as well as conventional treatments for symptoms, may foster communication between doctors and families about using CAM to reduce treatment-related symptoms.

**Burden on Society**

*Childhood cancer incidence has increased but is lower among minority children.* Although cancer in children is uncommon, data indicate an upward trend in the number of new cases (incidence) of childhood cancer. The incidence of childhood cancer increased from 11.5 cases per 100,000 children in 1975 to 14.8 per 100,000 in 2004.\(^4\) This trend continued with an annual increase of 0.6% in the number of new cases each year between 2005 and 2009.\(^5\) The American Cancer Society (ACS) projects that 11,630 new cases of childhood cancer among children ages 0 to 14 years will be diagnosed in 2013.\(^5\)

The most recent data we identified for childhood cancer incidence among racial and ethnic groups was SEER data collected from 1990 to 1995. These data show that black children had lower cancer incidence rates than white children during that time period. Hispanic and Asian/Pacific Islander children’s cancer incidence rates were between those for white children and black children. Incidence among American Indian children was the lowest.\(^6\) In January of 2009, the estimated number of children aged 0 to 19 years living with cancer was 363,000.\(^7\)

*CAM is used by children with cancer.* Herbal remedies, diets and nutrition, and faith-healing were the most commonly studied CAM in a recent systematic review on the prevalence of CAM use. Fewer studies in the review reported on the use of homeopathy, megavitamins, mind-body therapies, and massage. Seven studies included in the review evaluated the association between race/ethnicity and CAM use; however, the review authors did not synthesize the
results from these studies. Estimates of CAM use among children with cancer vary widely, but most studies found that greater than 30% of children used CAM. A commonly reported reason for CAM use is to relieve adverse effects (such as nausea or pain) from cancer treatment.

Minority children may be less likely to use CAM. Data from the National Health Interview Survey, which was not limited to children with cancer, show that one in nine children use CAM. These data also show that CAM use is approximately two times more common among white children (12.8%) than black children (5.9%), and that non-Hispanic children (12.8%) are about 1.5 times as likely to use CAM as Hispanic children (7.9%). These data are not limited to children with cancer, and it is not clear if the same patterns of use apply to that group of children.

Options for Addressing the Issue
There is little evidence on the comparative effectiveness of CAM interventions among children with cancer. Likewise, there is little information about racial and ethnic differences around CAM use in pediatric cancer populations. Two recent systematic reviews identified by our searches took a comprehensive approach to investigating CAM use in childhood cancer. These reviews were not limited to a specific therapy or specific type of cancer and also did not clearly differentiate between use of CAM to treat cancer or to reduce symptoms related to cancer treatment. These reviews primarily reported descriptive results detailing how often and what type of CAM is used. Very few of the studies included in these reviews compared types of CAM with each other or with conventional symptom treatments, providing little evidence of the relative benefits or harms of CAM. We also identified one recent review that focused on specific symptoms and any type of CAM. This review considered CAM for the management of procedure-related pain, anxiety, and distress. Based on 32 studies, the authors concluded that hypnosis, distraction, and imagery are the three most common CAM therapies used to address pain, anxiety, and distress, and they may be effective when used alone or in conjunction with pharmacological therapies. However, the review did not address questions related to race and ethnicity.

We identified three systematic reviews that synthesized data on acupressure/acupuncture type therapies for reducing either post-operative or chemotherapy-induced nausea and vomiting.

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Two of these reviews\textsuperscript{13,14} focused on studies of acupressure to reduce post-operative nausea and vomiting, and each reported data from studies of pediatric populations, but the studies used in the analyses did not include or were not limited to children with cancer. The third review, which was focused on acupressure for reducing chemotherapy-induced nausea and vomiting, included at least one study of pediatric populations, but did not analyze data among children separately from adults.\textsuperscript{15} These reviews did not include results related to race and ethnicity.

Guidelines from the Society for Integrative Oncology set forth general recommendations for discussing the use and availability of CAM therapies with cancer patients, as well as recommendations about the use of specific CAM therapies. The guidelines present evidence for each recommendation; however, very little information about childhood cancers and pediatric cancer patients is included in the guidelines.\textsuperscript{16} We did not find any clinical practice guidelines specific to CAM use for children.

Based on available evidence, we cannot draw conclusions about the effectiveness of CAM on reducing symptoms related to treatment of childhood cancers. Nor can we draw conclusions about the presence of disparities between racial and ethnic groups in (1) the incidence of symptoms related to childhood cancer treatment or (2) the use of or effectiveness of CAM therapies for relieving symptoms related to cancer treatment among groups.

Directly applicable research on the use of CAM in pediatric cancer populations is lacking. In 2006, one study noted that approximately 900 reports of clinical trials using a CAM intervention for children were found. However, most studies of CAM among cancer patients do not include children.\textsuperscript{17} Data from adult studies are not always applicable to pediatric populations; children may have different experiences than adults with side effects and drug interactions.\textsuperscript{18} Research that is directly applicable; describes or addresses differences, if any, among racial and ethnic minorities; and can be used to guide the use of CAM in pediatric cancer patients is lacking. Future work would likely require collecting new information over time.

The National Cancer Institute (NCI) states that improvements in overall childhood cancer survival mean that researchers, patients, parents, and healthcare providers are focusing more on reducing the burden of cancer and its treatment.\textsuperscript{19} In 1998, NCI established the Office of

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Cancer Complementary and Alternative Medicine,\textsuperscript{20} and several studies listed on its website are focused on pediatric populations,\textsuperscript{21} suggesting momentum in this area. It is not clear if any of the ongoing studies will address questions of racial and ethnic disparities or explore issues of access related to socioeconomic status.

Ongoing and future research that resolves questions about potential disparities and the comparative effectiveness of CAM may lead to more informed choices about options for reducing symptoms related to cancer treatment. High-quality evidence about positive and negative interactions between CAM and conventional cancer therapies may foster communication between doctors and families about the use of CAM.

**Potential for New Information to Improve Care and Patient-Centered Outcomes Rapidly**

Evidence regarding disparities, efficacy, and patient preferences is a necessary foundation for future research. Because pediatric cancer patients are already using CAM, healthcare providers, patients, and parents need access to reliable information about the comparative benefits and harms of CAM therapies. Available evidence is likely to be adapted and applied quickly if it is broadly disseminated, given the small number of providers treating these children. However, there are some barriers to the implementation of integrating CAM with conventional cancer treatment. Parents and healthcare providers may need training in order to deliver and apply some therapies. Also, clinical practice guidelines and standardization for some CAM therapies are lacking. Access to CAM may be limited to those who can afford to pay for them and who live where CAM resources and services are available.

Research to lessen disparities in the use or benefit of CAM in this population should be considered only after there is documentation that shows disparities exist. This research should also be preceded by evidence that CAM interventions perform better than or as well as conventional medical treatments or evidence showing that patients prefer them even if they do not work quite as well. Comparative effectiveness of and interactions between CAM therapies and conventional treatments may need to be updated as advancements are made in conventional cancer and supportive treatments.

**References**

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