

## INTRODUCTION

# Advancing the Global Impact of Integrative Oncology

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Cancer is a global disease. In 2015, there were 17.5 million cancer cases and 8.7 million cancer deaths worldwide (1). By 2020, these numbers are expected to rise to 21.7 million new cases and 13 million deaths (2). With 16% of all deaths due to cancer in 2015, it is the second leading cause of death worldwide, and the past decade has seen a 33% increase in the number of cancer cases globally, due in large part to population aging and growth (1). From Cameroon to England, China to the Middle East, in our wealthiest and poorest countries, cancer is present; it does not discriminate.

People throughout the world employ a variety of strategies to cope with the physical, emotional, and spiritual impact of cancer. In recent years, the field of integrative oncology has emerged as a scientific discipline to carefully research and bring together evidence-based complementary/traditional medicine therapies and conventional cancer treatment to address the diverse needs of cancer patients and their families. Many complementary therapies, such as acupuncture, yoga, and natural products originated from regions outside of North America thousands of years ago and are used extensively in their countries of origin today. For example, in China the use of Traditional Chinese Medicine (TCM) herbal therapies in cancer patients exceeds 80% (3).

Despite such wide empirical use, rigorous research in this area remains limited. Because of the many barriers in language, culture, regulatory environments, and funding mechanisms, much is “lost in translation.” The clinical wisdom of the East is unknown to the West, while the experimental rigor of the West remains poorly integrated into the research enterprises of the East. However, there are indications that this is changing. In 2015, Professor Youyou Tu in China received the Nobel Prize for her impactful work on the herbal extract artemisinin for malaria (4), inspiring researchers in the field to apply rigorous methods to their research in integrative medicine, and further indicating the rise of this important emerging field.

In the United States, the Memorial Sloan Kettering Cancer Center established its Integrative Medicine Service in 1999. Soon, other leaders in cancer care, such as the University of Texas MD Anderson Cancer Center and the Dana-Farber Cancer

Center were forming dedicated programs focused on integrating complementary therapies into cancer care. Over the past several years, the presence of integrative medicine at US National Cancer Institute (NCI)-designated cancer centers has increased greatly, with the majority of centers now offering some form of integrative treatment (5).

Established in 2003, the Society for Integrative Oncology (SIO) is an international, multidisciplinary, and interprofessional organization that seeks to advance evidence-based, comprehensive, integrative health care to improve the lives of people affected by cancer ([www.integrativonc.org](http://www.integrativonc.org)). Today, SIO has nearly 500 members representing 21 countries. In this special *Journal of the National Cancer Institute* monograph, we present a collection of original research and perspective manuscripts to highlight both the challenges and opportunities for advancing the global impact of integrative oncology.

On the research path, it is essential to confront the vast global disparities that exist in cancer care and the role that effective integration of allopathic and traditional medicine can play to address these imbalances (6). Recognizing this need, in concert with the steadily increasing growth and impact of our field around the globe, a group of multidisciplinary scholars propose a long-needed definition of “integrative oncology” to give this field a focus and clarity, no matter what language we speak (7).

From here, we move to the Middle East, where a group of clinician researchers from five countries are collaborating to advance the practice of integrative oncology (8). We then consider a global overview of the integrative oncology activities in pediatric units of low- and middle-income countries (9); learn about the findings of a prospective cohort study on Chinese colorectal cancer patients and their use of traditional Chinese herbal medicine (10); visit the United Kingdom to learn about “whole person” oncology (11); and appreciate the growth of integrative medicine in leading NCI Comprehensive Cancer Centers in the United States (5).

We then turn to specific evidence-based approaches to improve integrative oncology clinical care, including comprehensive lifestyle changes to optimize cancer prevention and

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outcomes (12); mind-body therapies for managing distress (13); and the role of physical activity along the cancer care continuum (14). To accelerate the pace of evidence generation for patients and health care providers, we highlight important research methods: a new paradigm of comparative effectiveness research to evaluate real-world outcomes (15); the patient perspective to inform design and conduct in patient-centered outcomes research (16); and a report on the development and validation of a patient-reported outcome tool for use with Traditional Chinese Medicine (17).

We conclude the monograph with three papers from the NCI, whose vision and leadership paves the way to advance comprehensive cancer care, including integrative oncology via rigorous research. The NCI has established a long-term collaboration with the China Academy of Chinese Medical Sciences for a number of basic natural product research projects, coordinated by the Office of Cancer Complementary and Alternative Medicine (18). Recently, NCI organized two separate workshops and presented white papers on cancer Complementary and Alternative Medicine therapeutics research (19) and oncology acupuncture for symptom management (20). The leading investigators and scholars in the field presented on the state of science, challenges, and opportunities, in addition to making recommendations for advancing rigorous integrative oncology research.

With the publication of this special JNCI monograph, we hope to promote global collaborations among researchers, clinicians, funders, patient advocates, and key societal stakeholders. Together, we can accelerate the pace of discovery and translation to enhance the evidence-informed growth of integrative oncology and alleviate suffering from cancer worldwide.

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