

**OBJECTIVES:**

*To provide an overview and update of physical activity (PA) research across the entire cancer control continuum.*

**DATA SOURCES:**

*Previous cancer control frameworks and selected PA and cancer research that has been published over the past 5 years.*

**CONCLUSION:**

*There have been major scientific advances in PA research across many, but not all, of the cancer control categories over the past 5 years.*

**IMPLICATIONS FOR NURSING****PRACTICE:**

*Nurses should have a comprehensive understanding of the potential role of PA across the entire cancer control continuum.*

**KEYWORDS:**

*Exercise, cancer survivor, prevention, rehabilitation, health promotion, palliation, survivorship*

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# PHYSICAL ACTIVITY AND CANCER CONTROL

KERRY S. COURNEYA AND CHRISTINE M. FRIEDENREICH

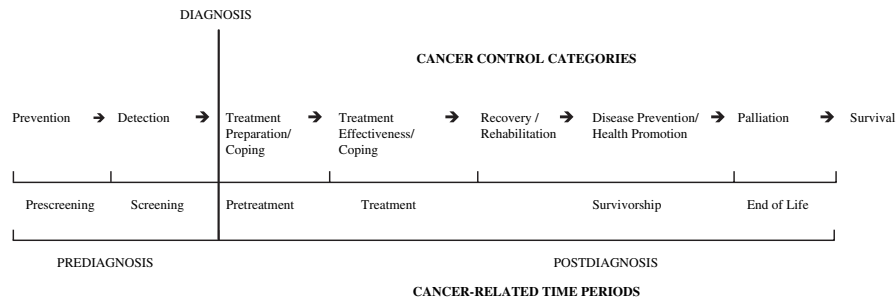
**T**O THE BEST of our knowledge, this is the first time that any peer-reviewed journal has dedicated an entire issue to the topic of physical activity (PA) across the entire cancer control continuum. Consequently, this special issue marks a milestone in the evolution of PA and cancer research and it is a direct result of the rapid growth of knowledge in this field. The compelling data produced in this field has resulted in PA receiving a prominent place in the American Cancer Society's guidelines for cancer prevention<sup>1</sup> and for cancer survivors.<sup>2</sup>

The purpose of this article is to provide an overview and update of PA research across the entire cancer control continuum. We begin by proposing a PA and cancer control framework modified from our original framework proposed in 2001<sup>3</sup> and our adapted framework proposed in 2004.<sup>4</sup> We then briefly highlight what we consider to be some of the major scientific advances in PA research over the past 5 years within each of the cancer control categories. Finally, we offer directions for future research that may guide the major scientific advances over the next 5 years.

## A FRAMEWORK FOR PHYSICAL ACTIVITY AND CANCER CONTROL

**I**n 2001, we proposed a framework called Physical Exercise Across the Cancer Experience (PEACE) to help organize, focus, and stimulate research on PA and cancer control.<sup>3</sup> At that time, our focus was primarily on the supportive care outcomes of PA (eg, physical functioning, quality of life [QOL]) with less attention to the clinical outcomes (ie, disease and treatment-related outcomes). In 2004, we adapted this framework to more explicitly highlight the clinical outcomes.<sup>4</sup> Here, we present a modified framework that integrates our two previous frameworks and also takes into account the Institute of Medicine's (IOM) recent adaptation of the National Cancer Institute's Cancer Control Continuum.<sup>5</sup> Our newly proposed Physical Activity and Cancer Control (PACC) framework is presented in **Figure 1**.

The main changes from our original PEACE framework are the modification of the cancer-related time periods and the explicit



**FIGURE 1.** Physical activity and cancer control framework.

integration of clinical outcomes into the labeling of the cancer control categories. The PACC framework proposes six cancer-related time periods: two pre-diagnosis (pre-screening and screening) and four post-diagnosis (pre-treatment, treatment, survivorship, and end of life). As noted in our original PEACE framework,<sup>3</sup> pre-screening includes the entire time period prior to cancer screening (ie, lifetime), whereas the screening time period includes the time from a given screening test until the result of the test is known (which may last weeks or months). Pre-treatment includes the time period after a definitive cancer diagnosis until treatment is initiated, which may range from weeks to several years for some cancers (eg, non-Hodgkin's lymphoma or prostate cancer). The treatment time period is becoming more difficult to define with the advent of longer-term, less intensive treatments (eg, hormone therapies for breast cancer that can last 5 years or longer). Nevertheless, the focus of the treatment time period is usually on the "primary" cancer treatments such as surgery, radiation therapy, chemotherapy, and biologic therapies. The amount of time spent in the treatment phase may last months or years.

A newly incorporated time period—survivorship—is based on the IOM's recent definition of the survivorship time period as: "the period following first diagnosis and treatment and prior to the development of a recurrence of cancer or death."<sup>5(p. 23)</sup> The IOM has noted: "This period of survivorship represents a distinct phase of the cancer control continuum that has not been well-described."<sup>5(p. 23)</sup> We had originally divided this time period into "post-treatment" and "resumption" time periods, but survivorship has become a popular term that is intended to incorporate both these time periods. We have also added "end of life" as a distinct time period based on the IOM's proposed cancer control continuum. As

noted in our original PEACE framework,<sup>3</sup> it is recognized that these time periods are not always discrete categories and that individuals may cycle through these time periods multiple times (eg, multiple screenings, multiple treatments, multiple recurrences, second primaries).

Based on these six time periods, we still propose the same eight cancer control categories we originally proposed, but we have modified some of the labels to make the clinical outcomes more explicit. The two pre-diagnosis cancer control categories remain the same (prevention and detection), as do the two end-of-life cancer control categories (palliation and survival). The four "in between" cancer control categories have been relabeled treatment preparation/coping (formerly buffering), treatment effectiveness/coping (formerly coping), recovery/rehabilitation, (formerly rehabilitation), and disease prevention/health promotion (formerly health promotion).

The number and nature of these cancer control categories can be contrasted with the IOM's<sup>5</sup> recently proposed framework that was adapted from the National Cancer Institute's cancer control continuum. The IOM's framework highlights six major cancer control categories, two that occur pre-diagnosis (prevention and early detection), one that is diagnosis itself, and three that occur post-diagnosis (treatment, survivorship, and end-of-life care). Five of the cancer control categories are the same as in the PACC framework (prevention, detection, treatment, survivorship, and end of life), but there are several differences. First, we continue to exclude diagnosis as a cancer control outcome in our PACC framework because it does not appear that PA could influence the actual diagnosis of a cancer. Second, we maintain "pre-treatment" as a distinct time period because it may last several months or years for some cancer survivor groups and PA interventions during

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