



**INSIDE:**

Young Adult Cancer Survivors ..... 1  
 Meditation and the Immune System ..... 2  
 Walking and Metastatic Cancer ..... 2  
 Dietary Patterns and Telomere Length ..... 3  
 Lifestyle Modification and Breast Cancer ..... 4  
 Physical Activity for Caregivers ..... 5

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**RESEARCH UPDATES SPRING 2017**

**FOR THE LATEST IN WORLDWIDE SUPPORTIVE CANCER CARE**

**IN THIS ISSUE:** Galán's team reviews the individual needs of adolescent and young adult cancer survivors. Black and Slavich explore the impact of mindfulness on the immune system. A paper by Tsianakas's team looks at the impact of a walking program for individuals with recurrent or advanced cancers. Rafie and colleagues explore the impact of dietary patterns on telomere length. And lastly, Lambert and colleagues explore the role of physical activity in the lives of caregivers.

**YOUNG ADULT CANCER SURVIVORS**

Galán, S., de la Vega, R., & Miró, J.

**Needs of adolescent and young adults after cancer treatment: A systematic review**

*European Journal of Cancer Care* (2016): 1–14. DOI: 10.1111/ecc.12558

**ABSTRACT |** The aim of this study was to conduct a systematic review of the literature on the needs of adolescents and young adults (AYA) who have survived cancer. PRISMA recommendations for systematic review were followed and the quality of the studies reviewed was also assessed with a specific checklist. The following databases were searched from their inception to May 2016: ERIC, EMBASE, MEDLINE, PILOTS, ProQuest, PsycARTICLES, PsycBOOKS, psycCRITIQUES, PsycINFO, Social Services Abstracts and Sociological Abstracts. Fourteen studies were identified and analysed. The results show that the most common needs to AYA cancer survivors are as follows: “individualised information and advice,” “counselling and psychological support” and “social support, and social relationships.” These results are different from those reported in studies on adults, which shows the importance of specifically addressing the needs of this population. In order to advance in this emerging area of study and facilitate the work of health professionals, it is crucial to reach a consensus on two central issues: how the needs of AYA survivors should be conceptualized and what the most valid and reliable procedure for assessing patient's needs is.

**INSPIREHEALTH'S INTERPRETATION:** The authors of this study set out to identify the needs of adolescent and young adult (AYA) cancer survivors by performing a systematic review. For this paper, “cancer survivor” refers to someone who has completed treatment for cancer and has the desire to move on with life. AYA refers to people aged 14-39 years. Different experiences and risks have been identified for AYA cancer survivors compared to other cancer survivor populations. These are related to type of cancer, longer term treatment effects, and developmental factors such as age related worries (e.g. fertility). Because of these differences, it is important to consider that the healthcare and support needs of AYA cancer survivors may be different. In a systematic review, results from several studies are analyzed together to draw more comprehensive conclusions on a topic.

The articles included in this systematic review were found by searching databases with keywords. Of 1201 articles considered, only 14 met the inclusion and specific quality assurance criteria. These articles were a mix of qualitative and quantitative method studies, included both male and female participants, and included participants with various types of cancer. Common themes among the studies were identified and categories of needs were created to classify the results. Categories were scored based on how many times themes in that category were assessed in the 14 studies. The highest scored categories were: individualized information and results, counselling and psychological support, and social support and social relationships. The studies also reported within population differences, needs varied depending on time after end of treatment, type of treatment, sex, and age. Because social support is typically sought from family and friends in the AYA population it is also important to

consider the influence of factors related to these relationships. Identifying needs is the first step in developing relevant tools for health professionals and a supportive healthcare system for AYA cancer survivors. This information will help in designing prevention and intervention strategies to support AYA cancer survivors. Overall, this article provides support for increased access to individualized information and counselling services, and highlights the importance of relationships and social support for AYA cancer survivors. InspireHealth offers programs specifically for AYA cancer survivors including support groups, movie nights, mindfulness and outdoor adventure events.

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## MEDITATION AND THE IMMUNE SYSTEM

Black, D.S., & Slavich, G.M.

### Mindfulness meditation and the immune system: A systematic review of randomized controlled trials

*Annals of the New York Academy of Sciences* (2016), 1373, 13-24.

**ABSTRACT** | Mindfulness meditation represents a mental training framework for cultivating the state of mindful awareness in daily life. Recently, there has been a surge of interest in how mindfulness meditation improves human health and well-being. Although studies have shown that mindfulness meditation can improve self-reported measures of disease symptomatology, the effect that mindfulness meditation has on biological mechanisms underlying human aging and disease is less clear. To address this issue, we conducted the first comprehensive review of randomized controlled trials examining the effects of mindfulness meditation on immune system parameters, with a specific focus on five outcomes: (1) circulating and stimulated inflammatory proteins, (2) cellular transcription factors and gene expression, (3) immune cell count, (4) immune cell aging, and (5) antibody response. This analysis revealed substantial heterogeneity across studies with respect to patient population, study design, and assay procedures. The findings suggest possible effects of mindfulness meditation on specific markers of inflammation, cell-mediated immunity, and biological aging, but these results are tentative and require further replication. On the basis of this analysis, we describe the limitations of existing work and suggest possible avenues for future research. Mindfulness meditation may be salutogenic for immune system dynamics, but additional work is needed to examine these effects.

**INSPIREHEALTH'S INTERPRETATION:** Mindfulness involves paying attention to our thoughts, feelings, and body sensations in the present moment without judging them. These authors summarized that “mindfulness-based interventions serve as a template for translating ancient teachings into a language and practice that is easily understood by contemporary society”. Since the mid-1960s researchers have been interested in understanding how a mindfulness-based practice may positively influence health. Drs. Black and Slavich reviewed the literature published between 1966 and 2015 on mindfulness meditation and immune system activity. They selected 20 studies that used randomized controlled trial designs and tested mindfulness meditation on immune system biomarkers related to inflammatory processes, immune cell count, and antibody responses. Most studies used a Mindfulness-Based Stress Reduction program which was developed and standardized in the 1970s. All studies used weekly group-based sessions spanning between six and ten weeks. Overall about 1600 participants were included for this systematic analysis. Participants were recruited if they had a disease process (e.g. HIV, cancer, rheumatoid arthritis), a risk factor for illness (e.g. poor sleep, obesity), or were healthy (e.g. corporate employees).

Though studies varied in patient population, lab markers measured, and design, overall results indicated biological benefit with a mindfulness practice. Inflammatory markers that dampen the activity of beneficial immune response genes were reduced, immune cell counts generally improved or stabilized (especially among patients with HIV and breast cancer), immune cells resisted death, and some studies showed improved antibody production to the influenza virus. Taken together these findings demonstrate potential biological benefit to a mindfulness practice but the authors caution “against exaggerating the positive effects of mindfulness meditation on immune system dynamics until these effects are further replicated and additional studies are performed.” Although additional research in the area is needed, a mindfulness-based practice can lead to several subjective measures of benefit such as reduced stress, better ability to cope, and improved sleep and mood, without any troublesome or detrimental side effects. InspireHealth offers in-centre meditation classes as well as a weekly online meditation every Thursday between 7:00 and 7:45pm. Registration is available through the website [www.inspirehealth.ca](http://www.inspirehealth.ca)

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## WALKING AND METASTATIC CANCER

Tsianakas, V., Harris, J., Ream, E., et al.

### CanWalk: feasibility study with embedded randomised controlled trial pilot of walking intervention for people with recurrent or metastatic cancer

*BMJ Open* (2017); 7:e013719. doi:10.1136/bmjopen-2016-013719.

**ABSTRACT | Objectives:** Walking is an adaptable, inexpensive and accessible form of physical activity. However, its impact on quality of life (QoL) and symptom severity in people with advanced cancer is unknown. This study aimed to assess the

feasibility and acceptability of a randomised controlled trial (RCT) of a community based walking intervention to enhance QoL in people with recurrent/metastatic cancer. **Design:** We used a mixed-methods design comprising a 2-centre RCT and nested qualitative interviews. **Participants:** Patients with advanced breast, prostate, gynaecological or haematological cancers randomized 1:1 between intervention and usual care. Intervention: The intervention comprised Macmillan's 'Move More' information, a short motivational interview with a recommendation to walk for at least 30 min on alternate days and attend a volunteer-led group walk weekly. **Outcomes:** We assessed feasibility and acceptability of the intervention and RCT by evaluating study processes (rates of recruitment, consent, retention, adherence and adverse events), and using end-of-study questionnaires and qualitative interviews. Patient reported outcome measures (PROMs) assessing QoL, activity, fatigue, mood and self-efficacy were completed at baseline and 6, 12 and 24 weeks. **Results:** We recruited 42 (38%) eligible participants. Recruitment was lower than anticipated (goal n=60), the most commonly reported reason being unable to commit to walking groups (n=19). Randomisation procedures worked well with groups evenly matched for age, sex and activity. By week 24, there was a 45% attrition rate. Most PROMs while acceptable were not sensitive to change and did not capture key benefits. **Conclusions:** The intervention was acceptable, well tolerated and the study design was judged acceptable and feasible. Results are encouraging and demonstrate that exercise was popular and conveyed benefit to participants. Consequently, an effectiveness RCT is warranted, with some modifications to the intervention to include greater tailoring and more appropriate PROMs selected.

**INSPIREHEALTH'S INTERPRETATIONS:** The benefits of walking are well-documented, however, the scientific literature is unclear as to whether walking improves well-being in people with recurrent or metastatic cancer. This randomized controlled design piloted the feasibility of a walking program for patients diagnosed with advanced cancers. Forty-two participants with advanced breast, prostate, gynaecological, or haematological cancer were recruited into this study. Half of them participated in a 12-week (three month) program that consisted of walking for 30 minutes on alternate days, a 15 minute motivational telephone interview, printed material promoting physical activity, and encouragement to attend a weekly walking group. Researchers also encouraged participants to plan ways to increase physical activity. The other half of the participants served as a control, which consisted of standard care.

Just over half of the participants completed the 12-week exercise program, while almost a third of the exercise participants withdrew after the first six weeks. Primary outcomes in the form of surveys that assessed functional assessment and well-being (physical, social, emotional, functional) were largely non-significant between the walking group and the control. This may have been due to the small sample size. However, participant interviews indicated a positive response for the walking program. Also, the process of completing surveys and using pedometers to measure well-being may have stimulated participants in both groups to increase physical activity. There were no adverse effects and most self-initiated walks were acceptable for the participants. The main conclusion of this pilot study is that a community-based walking program may be feasible and beneficial for those with advanced cancer. It is best to work with a trained professional to assist with exercise program design.

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## DIETARY PATTERNS AND TELOMERE LENGTH

Rafie, N., Hamedani, H., Barak, F., et al.

### Dietary patterns, food groups and telomere length: a systematic review of current studies

*European Journal of Clinical Nutrition* (2017): 71, 151–158.

**ABSTRACT |** Telomere length (TL) is recognized as a biomarker of aging and shorter telomeres are linked with shorter lifespan. Inter-individual variability in telomere length is highly heritable. However, there has been a resurgence of interest in the controversial relationship between diet and TL. Evaluating the impact of diet at the food group and dietary pattern level will provide greater insight into the effect of diet on TL dynamics, which are of significant importance in health and longevity. This article reports the first systematic review of the relation between food groups, dietary patterns and TL in human populations based on PRISMA guidelines. **Design:** PubMed, Science Direct, The Cochrane Library and Google Scholar databases were electronically searched for all relevant studies, up to November 2015. Among the 17 included studies, 3 and 10 of them were regarding the effect of dietary patterns and various food groups on TL, respectively. Also, in 4 studies, both dietary patterns and different food groups were assessed in relation to TL. Mediterranean dietary pattern was related to longer TL in 3 studies. Five studies indicated beneficial effect of fruits or vegetables on TL. In 7 studies, a reverse association between TL and intake of cereals, processed meat, and fats and oils was reported. Our systematic review supports the health benefits of adherence to Mediterranean diet on TL. Except for the fruits and vegetables, which showed positive association with TL, results were inconsistent for other dietary factors. Also, certain food categories including processed meat, cereals and sugar-sweetened beverages may be associated with shorter TLs. However, additional epidemiological evidence and clinical trials should be considered in future research in order to develop firm conclusions in this regard.

**INSPIREHEALTH'S INTERPRETATION:** In the November 2014 issue of *Research Updates*, we reviewed a small Canadian study entitled "Mindfulness-based cancer recovery and supportive-expressive therapy maintain telomere length relative to controls in distressed breast cancer survivors", which examined the effects of psychological interventions on telomere length.

For this systematic review, researchers searched the literature for studies assessing the effects of food groups and dietary patterns on telomere length. They used specific criteria to identify the most methodologically sound studies. Telomeres are protein “caps” on the ends of chromosomes that provide stability and protection to our genes. Telomeres naturally shorten during natural and routine cell division and shorter telomeres are associated with normal aging. Shorter telomeres have also been associated with poorer cancer prognosis. Additionally, there is evidence that telomere shortening may be exacerbated by oxidative stress and inflammation. Both of these may be reduced by healthy dietary patterns such as the Mediterranean diet which is high in vegetables and fruit, whole grains, nuts/seeds, healthy fats (e.g. olive oil), legumes and fish, and low in processed foods, high saturated fat foods, and meats. Such a healthy diet is higher in foods with anti-oxidant and anti-inflammatory properties.

The authors identified 17 studies for review. Results were inconsistent but generally showed that consumption of a Mediterranean-style diet was associated with longer telomere length, especially among higher quality studies. Overall, higher consumption of processed cereals/meats and sugar-sweetened beverages was associated with shorter telomere length. The authors caution that despite their best efforts to include only high quality studies, several study limitations were nevertheless noted. Dietary research is notoriously difficult to conduct with many potential limitations, such as variations in study populations, failure to adequately control for confounding factors (such as healthier diet is usually associated with other healthful characteristics such as not smoking, being active and having a healthy body weight), and challenges in measuring actual food consumption. In the meantime, no studies show detriment to eating a mostly Mediterranean-style diet.

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## LIFESTYLE MODIFICATION AND BREAST CANCER

Hamer, J. & Warner, E.

### Lifestyle modifications for patients with breast cancer to improve prognosis and optimize overall health

CMAJ 2017 February 21;189:E268-74. doi: 10.1503/cmaj.160464

**ABSTRACT** | Physical activity has the strongest effect on reducing the risk of breast cancer recurrence and death. All patients with breast cancer (except for those who have an abnormally low body mass index before diagnosis) should avoid gaining weight. Patients who are obese and those who smoke have a higher risk of cancer recurrence, but it is unclear whether their prognosis can be improved by weight loss or smoking cessation. Soy consumption is not harmful.

**INSPIREHEALTH'S INTERPRETATION:** This comprehensive review was recently published in the February 2017 issue of the *Canadian Medical Association Journal*. The two authors searched the literature to identify studies examining the impact of various lifestyle factors on breast cancer survivorship. The authors note that it is often difficult to study lifestyle factors independently because women who engage in healthier behaviours such as physical activity are often leaner, eat a healthier diet, and do not smoke. Studies which statistically control for these variables have more robust results. Women who are overweight or obese at diagnosis have a poorer prognosis as do women who gain more than 10% of their pre-diagnosis weight. Women with metabolic syndrome (at least three of the following: abdominal obesity, high blood pressure, low levels of high density lipoproteins (a good type of cholesterol), high triglycerides, high blood sugar) are at a significantly increased risk for developing distant metastases.

Research to date indicates that weight loss may reduce the risk of breast cancer recurrence especially if the weight loss is associated with a reduction in unhealthy dietary fats such as high fat dairy products. Consumption of low-fat dairy does not seem to be associated with an increased risk of recurrence. A recent meta-analysis showed that a Mediterranean diet including moderate red wine intake neither increased nor decreased the risk of cancer recurrence, though some data suggests that the Mediterranean diet without alcohol improves breast cancer survival. Clearer relationships between alcohol consumption and breast cancer development and recurrence are also emerging. Pooled analysis of four good quality studies showed that intake of more than one drink per day was associated with a 28% increased risk of recurrence. Some researchers believe there is no safe level of alcohol after a diagnosis of breast cancer and others caution to consume one or fewer drinks per day. There is no evidence that soy food consumption increases the risk of recurrence, but soy supplements should be avoided. There is also a clear relationship between currently smoking and cancer recurrence and smoking cessation is always recommended for a variety of health benefits.

Optimizing physical activity has the most robust evidence on reducing breast cancer recurrence. Patients are encouraged to participate in at least 30 minutes of moderate intensity (i.e. able to talk but not sing) activity five days per week together with two to three strength training sessions per week on non-consecutive days. The authors caution that breast cancer biology can vary widely between women and it is always important to note that although healthy lifestyles often protect against recurrence, they cannot always improve outcomes. Women “...should not be made to feel that inadequate lifestyle changes have led to their recurrence of cancer.”

## PHYSICAL ACTIVITY FOR CAREGIVERS

Lambert, S.D., Duncan, L.R., Kapellas, S., et al.

### A descriptive systematic review of physical activity interventions for caregivers: Effects on caregivers' and care recipients' psychosocial outcomes, physical activity levels, and physical health

*Annals of Behavioral Medicine* (2016), 50:907–919

**ABSTRACT | Background:** Caregiving can adversely impact individuals' psychosocial and physical well-being. An important task in health research is to find effective ways to enhance caregivers' health and functioning. **Purpose:** To provide a systematic review of the efficacy of physical activity (PA) interventions for caregivers on their and the care recipients' psychosocial outcomes, PA levels, and physical health. **Methods:** Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist, a descriptive systematic review of studies examining the effects of PA interventions for caregivers on their outcomes and those of the care recipients was conducted. Studies were primarily identified through searching electronic databases. **Results:** Fourteen studies were reviewed. PA interventions significantly decreased caregivers' distress and increased their well-being, quality of life, sleep quality, PA levels, self-efficacy for caregiving or exercise, and readiness for exercise. Most PA interventions targeted the caregiver alone. Two studies examined the impact of the intervention on the care recipient and found no significant effect. **Conclusions:** PA interventions hold promise in improving caregivers' outcomes. However, more high quality trials are needed before definitive conclusions can be drawn.

**INSPIREHEALTH'S INTERPRETATION:** While caregiving can improve the care recipient's health and reduce demands on the health care system, it may also have significant impact on the caregivers' psychological and physical health and may place caregivers for cancer patients at a high risk for burden. This review investigated the effect of physical activity interventions on psychological well-being, burden, physical activity levels, physical health, sleep quality, social functioning, and coping/readiness/self-efficacy of cancer patients' caregivers. Fourteen randomized controlled trials were included in this review and targeted caregivers of patients with various chronic illnesses. Studies were group- or home-based, offered telephone support or some combination and ranged from six months to one year. Due to large differences in the caregiver populations (care recipient illness, type of physical activity intervention, outcome measures, data collection time points), a descriptive assessment was performed. This means that the results from all the studies were discussed for each outcome.

Physical activity seemed to improve psychological well-being in half of the studies, particularly in those studies that incorporated yoga. Improvements in caregiver burden approached statistical significance after physical activity interventions. Less than half of the studies found consistent improvements in physical health. Most studies did find improvements in strength, balance, and physical functioning. Exercise interventions seemed to improve caregivers' efficacy for exercise more than self-care or coping self-efficacy. Two studies measured sleep quality, which seemed to improve with physical activity.

The authors conclude that physical activity could have a number of psychological benefits for caregivers. InspireHealth recognizes the unique needs of support people and welcomes them to participate in most InspireHealth classes, and to accompany patients during most consultations.

**InspireHealth** provides patients with the knowledge, tools, and services to support their overall health during and after cancer treatment. Our medical doctors value conventional cancer treatments such as chemotherapy, radiation, and surgery. At the same time, they recognize the importance of supporting health, immune function, body, mind, and spirit.

InspireHealth's programs are supported by current research and can be safely integrated with patient's conventional treatments.

InspireHealth's *Research Updates* are compiled by Rachel Mark, M.A. (kin)—with guidance from the editorial board—using InspireHealth's Research Information System, a unique supportive cancer care knowledge management database. The editorial board includes: Dr. Janice Wright, MD, CEO, Dr. Hannah Nette, MD, Dr. Lori McFarlane, MD, and Terry Heidt, M.Sc. For more information, email [library@inspirehealth.ca](mailto:library@inspirehealth.ca)

#### Lower Mainland Vancouver Centre

#200-1330 West 8th Ave.  
Vancouver, BC, V6H 4A6  
604.734.7125

#### Vancouver Island Victoria Centre

#212-2187 Oak Bay Ave.  
Victoria, BC V8R 1G1  
250.595.7125

#### Southern Interior Kelowna Centre

#123-565 Bernard Ave.  
Kelowna, BC V8R 1G1  
250.861.7125

[inspirehealth.ca](http://inspirehealth.ca)