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## RESEARCH UPDATES 2019 VOLUME 1

### FOR THE LATEST IN WORLDWIDE SUPPORTIVE CANCER CARE

**IN THIS ISSUE:** Baudry and colleagues discuss the impact that organic food consumption may have on cancer risk. Duncan's team perform a review exploring non-pharmacological interventions on quality of life among cancer survivors. In a systematic review and meta-analysis by Kannan et al, the effectiveness of pelvic floor rehabilitation among men post-prostatectomy is reviewed. Turner and colleagues discuss interventions to promote habitual exercise. Thompson's team explore the global evidence of diet, nutrition, and physical activity to reduce cancer risk. Finally, Zimmerman and colleagues review mindfulness-based interventions on the psychological well-being of adults with advanced cancers.

## ORGANIC FOOD AND CANCER RISK

Baudry, J., Assmann, K.E., Touvier, M., et al.

### Association of frequency of organic food consumption with cancer risk: Findings from the NutriNet-Sante Prospective Cohort Study

*JAMA Internal Medicine* (2018), 178(12):1597-1606. doi:10.1001/jamainternmed.2018.4357

**ABSTRACT | Importance:** Although organic foods are less likely to contain pesticide residues than conventional foods, few studies have examined the association of organic food consumption with cancer risk. **Objective:** To prospectively investigate the association between organic food consumption and the risk of cancer in a large cohort of French adults. **Design, Setting, and Participants:** In this population-based prospective cohort study among French adult volunteers, data were included from participants with available information on organic food consumption frequency and dietary intake. For 16 products, participants reported their consumption frequency of labeled organic foods (never, occasionally, or most of the time). An organic food score was then computed (range, 0-32 points). The follow-up dates were May 10, 2009, to November 30, 2016. **Main Outcomes and Measures:** This study estimated the risk of cancer in association with the organic food score (modeled as quartiles) using Cox proportional hazards regression models adjusted for potential cancer risk factors. **Results:** Among 68 946 participants (78.0% female; mean [SD] age at baseline, 44.2 [14.5] years), 1340 first incident cancer cases were identified during follow-up, with the most prevalent being 459 breast cancers, 180 prostate cancers, 135 skin cancers, 99 colorectal cancers, 47 non-Hodgkin lymphomas, and 15 other lymphomas. High organic food scores were inversely associated with the overall risk of cancer (hazard ratio for quartile 4 vs quartile 1, 0.75; 95%CI, 0.63-0.88; *P* for trend = .001; absolute risk reduction, 0.6%; hazard ratio for a 5-point increase, 0.92; 95%CI, 0.88-0.96). **Conclusions and Relevance:** A higher frequency of organic food consumption was associated with a reduced risk of cancer. If these findings are confirmed, further research is necessary to determine the underlying factors involved in this association.

**INSPIREHEALTH'S INTERPRETATION:** This observational cohort study from France is one of the largest to look at the relationship between organic foods and cancer risk. The study involved classifying 68,946 volunteer participants according to their self-reported intake of organic products and then followed them for an average of 4.5 years. Two months after the enrollment, participants completed a questionnaire about their consumption of 16 categories of foods including estimates of portion-size during three 24-hour periods. During the study, 1340 (2%) were diagnosed with first-time cancer. Those with the highest frequency of organic food consumption had an associated risk reduction of 25% of being diagnosed with cancer during follow-up compared with those with the lowest frequency. This decreased risk was strongest for post-menopausal breast cancer, non-Hodgkin lymphomas (NHL), and all lymphomas. This study found that the participants who reported eating organic food most frequently were more likely to be female, older, better educated, more affluent, non-smokers, had less obesity, ate more vegetables and less red and processed meat, were more active and drank less alcohol. Overall, they had healthier diets and overall lifestyles than people who reported never eating organic food and the above listed factors would be expected to result in fewer cases of cancer in this group.

This study has notable strengths, such as its large sample size, and prospective design. Some noted limitations of the study include the low overall occurrence of cancer, as well as the study population. With 78% of the study respondents being women, this may decrease the ability to generalize results to the overall population. As is a limitation with the majority of nutrition-related studies, self-reported information (i.e. completing a dietary intake or questionnaire) has limitations such that recording of healthy behaviours could be inflated. At this current stage of research, the relationship between organic food consumption and cancer risk is still somewhat unclear. As noted above, there are many variables that may decrease cancer risk and the ability to untangle organic food consumption from others is always challenging. More research in this area is urgently needed because cancer is a serious public health challenge and foods containing pesticide residues are widely consumed.

Finally, it is important to note that there is compelling evidence that improving factors such as body weight, physical activity, and diet may lower cancer risk. For cancer prevention, InspireHealth supports consuming a healthful diet that limits red and processed meat and added sugars, replacing refined grains with whole grains, and increasing consumption of fruits and vegetables. For additional resources related to organic food choices and consumption, tools such as the Environmental Working Group “Dirty Dozen” and “Clean 15” provide annual lists of the most heavily sprayed and least sprayed produce items.

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## QUALITY OF LIFE INTERVENTIONS

Duncan, M., Moschopoulou, E., Herrington, E., et al.

### Review of systematic reviews of non-pharmacological interventions to improve quality of life in cancer survivors

*BMJ Open* (2017), 7:e015860. doi:10.1136/bmjopen-2017-015860

**ABSTRACT | Objectives:** Over two million people in the UK are living with and beyond cancer. A third report diminished quality of life. **Design:** A review of published systematic reviews to identify effective non-pharmacological interventions to improve the quality of life of cancer survivors. **Data Sources:** Databases searched until May 2017 included PubMed, Cochrane Central, EMBASE, MEDLINE, Web of Science, the Cumulative Index to Nursing and Allied Health Literature, and PsycINFO. **Study Selection:** Published systematic reviews of randomised trials of non-pharmacological interventions for people living with and beyond cancer were included; included reviews targeted patients aged over 18. All participants had already received a cancer diagnosis. Interventions located in any healthcare setting, home or online were included. Reviews of alternative therapies or those non-English reports were excluded. Two researchers independently assessed titles, abstracts and the full text of papers, and independently extracted the data. **Outcomes:** The primary outcome of interest was any measure of global (overall) quality of life. Analytical methods Quality assessment assessing methodological quality of systematic reviews (AMSTAR) and narrative synthesis, evaluating effectiveness of non-pharmacological interventions and their components. **Results:** Of 14 430 unique titles, 21 were included in the review of reviews. There was little overlap in the primary papers across these reviews. Thirteen reviews covered mixed tumour groups, seven focused on breast cancer and one focused on prostate cancer. Face-to-face interventions were often combined with online, telephone and paper-based reading materials. Interventions included physical, psychological or behavioural, multidimensional rehabilitation and online approaches. Yoga specifically, physical exercise more generally, cognitive behavioural therapy (CBT) and mindfulness-based stress reduction (MBSR) programmes showed benefit in terms of quality of life. **Conclusions:** Exercise-based interventions were effective in the short (less than 3–8 months) and long term. CBT and MBSR also showed benefits, especially in the short term. The evidence for multidisciplinary, online and educational interventions was equivocal.

**INSPIREHEALTH'S INTERPRETATION:** This research paper synthesized the findings of 21 systematic reviews examining non-pharmacological (i.e., non-drug/medication) approaches to improving quality of life (QoL) in those living with and beyond cancer. Systematic reviews summarize findings from a number of studies examining the same or similar variables. Overall, the authors were able to summarize the findings of 21 systematic reviews which included 465 primary studies. Thirteen reviews examined mixed tumour groups; seven focused on breast cancer and one on prostate cancer. In other words, a tremendous amount of information was included in this review of reviews. Cancer survivors experience poor QoL for a variety of reasons including depression, anxiety, fear of recurrence, poor social support, impacts on relationships and family, and difficulties coping. Stressful realities such as fatigue, sexual changes and reduced physical functioning can also compound poor QoL. Interestingly, both patients and carers were involved in the design and development of this review so that gathered information was as practical and applicable as possible. Ten of the reviews focused on physical interventions; three focused on yoga; four focused on psychosocial/behavioural intervention; one each focused on online education/multidimensional versus monodimensional interventions/multidisciplinary rehabilitation models/the effects of expressive writing.

Not surprisingly, the publications examining physical activity all demonstrated improved QoL. There was inconsistency across the reviews with regard to the types of exercise interventions that were most effective suggesting that any physical activity is likely to provide benefit. Of the psychological and behavioural interventions, none showed consistent benefit. Cognitive behavioural therapy (CBT), social and emotional support, personalized lifestyle interventions, and mindfulness-based stress reduction showed some benefit for QoL especially when provided on an individual basis. Overall, this research supports the model of both individualized and group lifestyle offerings at InspireHealth.

## PELVIC FLOOR TRAINING

Kannan, P., Winser, S.J., Fung, B., et al.

### Effectiveness of pelvic floor muscle training alone and in combination with biofeedback, electrical stimulation, or both compared to control for urinary incontinence in men following prostatectomy: Systematic review and meta-analysis

*Physical Therapy* (2018), 98(11):932-945. doi: 10.1093/ptj/pzy101

**ABSTRACT | Background:** The efficacy of pelvic floor muscle training (PFMT) alone and in combination with biofeedback (BFB), electrical stimulation (ES), or both for urinary incontinence in men following prostatectomy is inconclusive. **Purpose:** The purpose of this study was to determine whether PFMT works well alone or in combination with BFB, ES, or both in comparison with a control. **Data Sources:** The databases Ovid Medline, EMBASE, CENTRAL, Scopus, and Web of Science, and the specialized register of the Cochrane Incontinence Review Group were searched from study inception to August 2017. Abstract proceedings from urological meetings, including the European Association of Urology and the American Urological Association, were also searched. **Study Selection:** Randomized controlled trials that compared PFMT alone and PFMT with ES, BFB, or both and no treatment, placebo, or sham were included in the review. **Data Extraction, Synthesis, and Quality:** Two independent reviewers completed data extraction and quality appraisal. The Grading of Recommendations, Assessment, Development, and Evaluation tool was used for quality appraisal. Meta-analysis was done with software used for preparing and maintaining Cochrane reviews. **Limitations:** Methodological flaws in the included studies limited internal validity. **Conclusions:** PFMT alone, PFMT plus BFB and ES, and PFMT plus ES were more effective than the control for urinary incontinence following prostatectomy. The effect of PFMT plus BFB on post-prostatectomy incontinence remains uncertain.

**INSPIREHEALTH'S INTERPRETATION:** Prostate cancer is one of the most common types of cancer diagnosed worldwide. Prostatectomy, or surgical removal of the prostate gland, is a typical treatment and can be effective in men whose cancer was contained to the prostate gland. A potential side effect of this treatment is urinary incontinence. This occurs when there is damage to the muscles that control the flow of urine from the bladder out of the body. To manage incontinence post surgery, healthcare professionals recommend pelvic floor exercises. The muscles of the pelvic floor are found at the bottom of the pelvis and are involved in elimination functions of the body. By learning and practicing conscious contraction and relaxation of the appropriate muscles, men can improve urination control. There is no standardized pelvic floor exercise protocol however experts agree that the exercises should be done several times throughout the day for a few months to see an improvement. Biofeedback (BF) and Electrical Stimulation (ES) are techniques employed to support pelvic floor muscle training (PFMT): sensors are placed on relevant muscles which allows the person to see their muscle activity (biofeedback) and/or allows for the correct muscles to be stimulated to contract (electrical stimulation). While all of these techniques have been found to be effective for muscle training, it is not known whether one or a combination is most effective for treating incontinence after a prostatectomy. This paper is a summary of the data from 15 research studies with a total of 3503 participants comparing PFMT alone and in combination with ES and BF to no intervention. The authors found that men who did PFMT had improved incontinence compared to men with no training. Men who did PFMT and ES improved incontinence compared to men with no intervention and men who received fake ES. These improvements were observed right after the training but also on follow up (ranging from 1-12 months). PFMT combined with BF didn't have an effect on incontinence compared to no intervention but PFMT with ES and BF was effective in improving incontinence compared to fake ES training. Overall, the authors conclude that PFMT is an important intervention and can be effective as a stand alone treatment.

## EXERCISE AND CANCER

Turner, R.R., Steed, L., Quirk, H., et al.

### Interventions for promoting habitual exercise in people living with and beyond cancer

*Cochrane Database of Systematic Reviews* (2018), 9. doi: 10.1002/14651858.CD010192.pub3.

**ABSTRACT (shortened due to space limitations) | Background:** This is an updated version of the original Cochrane Review published in the Cochrane Library 2013, Issue 9. Despite good evidence for the health benefits of regular exercise for people living with or beyond cancer, understanding how to promote sustainable exercise behaviour change in sedentary cancer survivors, particularly over the long term, is not as well understood. A large majority of people living with or recovering from cancer do not meet current exercise recommendations. **Objectives:** To assess the effects of interventions designed to promote exercise behaviour in sedentary people living with and beyond cancer and to address additional research questions. **Search Methods:** We updated our 2013 Cochrane systematic review by updating the searches of the multiple electronic databases up to May 2018. We also searched the grey literature, trial registries, wrote to leading experts in the field and searched reference lists of included studies and other related recent systematic reviews. **Selection Criteria:** We included only randomised controlled trials (RCTs) that compared an exercise intervention with usual care or 'waiting list' control in sedentary people over the age of 18 with a homogenous primary cancer diagnosis. **Main Results:** We included 23 studies in this review, involving a total of 1372 participants (an addition of 10 studies, 724 participants from the original review); 227 full texts were screened in the update and 377 full texts were screened in the original review leaving 35 publications from a total of 23 unique studies included in the review. **Authors' Conclusions:** Goal setting, setting of graded tasks and instruction of how to perform behaviour, feature in interventions that meet recommendations targets and report adherence of 75% or more. However, long-term follow-up data are still limited, and the majority of studies are in white women with breast cancer.

**INSPIREHEALTH'S INTERPRETATION:** This paper is an update to a review paper published in 2013 examining what type of exercise interventions are most effective for people with a cancer diagnosis who are inactive. Some factors taken into consideration include: type, frequency, duration, and intensity of exercise; whether exercise was supervised and/or done at home; whether interventions were theory-based; and what behaviour change techniques were used in the intervention. Twenty three randomized controlled studies were included in this review with 1327 participants in total. Cancer types in the included studies were breast, prostate, colorectal, and lung. Studies were ranked based on two main factors: if the exercise dose met the recommended guidelines (150 minutes of moderate to vigorous aerobic activity per week and/or 2-3 strengthening sessions per week), and how many people in the studies actually followed the instructions, or adherence. The exercise interventions from the highest ranked studies all included exercise supervision (on average 2x per week) and behaviour change techniques such as goal setting, instruction, and progression.

Overall, the authors classified most of the data from the included studies as low grade evidence with a high risk of bias. This seems to be mostly related to challenges with combining data from different studies due to differences of measuring and reporting data. One other issue was that most studies included had participants report their physical activity rather than objectively measure it. Despite these challenges, this review found that aerobic fitness is improved at 8-12 weeks follow up following an exercise intervention. The authors conclude that due to the lack of quality evidence they could not address the purpose of the review. The need for more exercise interventions to incorporate theory based behaviour change techniques is emphasized. Despite these inconclusive results, the benefits of regular exercise are well-known and patients should work with a qualified professional to determine ways to incorporate regular movement into their routines.

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## LIFESTYLE FACTORS

Thompson, R., Mitrou, G., Brown, S., et al.

### Major new review of global evidence on diet, nutrition and physical activity: A blueprint to reduce cancer risk

*British Nutrition Foundation Nutrition Bulletin* (2018), 43, 269–283

**ABSTRACT |** The number of cancer cases is increasing. Despite advances in treatment, cancer causes one in six deaths worldwide and has overtaken cardiovascular disease as the leading cause of death in many parts of the world. Yet around 40% of cancer cases are preventable through lifestyle changes. The newly published Third Expert Report, Diet, Nutrition, Physical Activity and Cancer: A Global Perspective, from World Cancer Research Fund (WCRF) and American Institute for Cancer Research (AICR), provides a comprehensive analysis of the worldwide body of evidence on preventing and surviving cancer through diet, nutrition and physical activity. Using the most meticulous methods, evidence from studies on 17 cancers and 51 million people—including 3.5 million cancer cases—has been reviewed. The findings have been used to produce the latest global Cancer Prevention Recommendations—which together form a blueprint to prevent cancer that people can trust—and to identify priority areas for future research. The Report, summarised in this article, ensures that people are equipped with the knowledge needed to prioritise cancer prevention—be they researchers, medical or health professionals, policymakers, civil society organisations (including cancer organisations), the media or people looking to reduce their own risk of cancer or live well after a diagnosis. A whole-of-government, whole-of-society approach is necessary to create environments for people and communities that are conducive to following the WCRF/AICR Recommendations in order to reduce the number of deaths from preventable cancer.

**INSPIREHEALTH'S INTERPRETATION:** Recent studies are suggesting that up to 40% of cancers may be prevented with lifestyle interventions. This paper summarizes findings from global research examining diet, nutrition and physical activity in relation to cancer risk and survival. This work is used by the World Cancer Research Fund and the American Institute for Cancer Research to create an expert report. Findings presented in the paper confirm that nutrition and physical activity can be directly or indirectly related to cancer, with some factors being protective and others increasing the risk.

As expected, physical activity can decrease the risk of cancer. While there are many different types of activity, regular, moderate intensity activity (such as brisk walking) appears to have the greatest connection. Less physical activity and more screen time may be related to weight gain, overweight, and obesity. Body fat percentage is in turn highly associated with cancer risk (even more so than overall body weight). While it is still important to avoid overweight and obesity, the message is to focus on maintain a healthy body composition (muscle to fat ratio, and decreased body fat percentage). Both regular activity and proper nutrition contribute greatly to this.

The research summarizes that fast food, processed foods, red and processed meat, sugary drinks, alcohol, high glycemic load, high doses of beta-carotene supplements, and foods preserved by salting may also increase the risk of cancer. Many of those foods have artificial components and extra calories, including excessive amounts of salt, fat and sugar. They rarely contain plant-based foods, therefore lacking naturally-occurring fiber, vitamins and antioxidants. Those foods may also increase the risk of body fatness, previously mentioned as risk factor. Red meat is recommended in amounts below 350-500g per week, understanding that its consumption is not needed to have a healthy diet. Sugar is not included as risk factor, but high glycemic load is. High glycemic load foods raise blood glucose (blood sugars) quickly. Examples include white bread, white sugar and sugary beverages. The most important consideration about glycemic load is the way those foods are consumed (quantity, frequency, combination with other foods). The protective dietary factors include whole grains, foods high in fiber (fruit and

vegetables), a Mediterranean dietary pattern, coffee, certain dairy products and dietary calcium intake.

The authors recognize that no single food or nutrient can cause and/or cure cancer, and it is more about dietary patterns and lifestyle. This also suggests that there is no “cancer diet”, but many dietary patterns contribute to a healthy diet that helps to reduce the risk of cancer. The authors acknowledge that availability, affordability and acceptability of healthy foods may be the root cause of not following a healthy diet. InspireHealth offers individualized support in both exercise and nutrition through one-on-one consultations as well as group programming.

## MINDFULNESS INTERVENTIONS AND ADVANCED CANCER

Zimmerman, F.F., Burrell, B., & Jordan, J.

### The acceptability and potential benefits of mindfulness-based interventions for improving psychological well-being for adults with advanced cancer: A systematic review

*Complementary Therapies in Clinical Practice* (2017), 30, 68-78

**ABSTRACT | Objective:** In spite of supportive care for people affected by cancer being well recognized as a priority for research, there is little solid evidence of the effectiveness of psychological interventions using mindfulness for those with advanced cancer. This systematic review aims to describe, evaluate and synthesize the acceptability and potential benefits of mindfulness-based interventions (MBIs) for the psychological well-being of people with advanced cancers. **Methods:** Eight databases were searched and terms related to advanced stages of cancer and mindfulness were combined systematically to identify relevant published literature. Inclusion criteria were studies with adults only and all types of cancer at stages III and IV. There was considerable variety in the MBI treatment packages including in the extent and centrality of mindfulness in the interventions. **Results:** Of 312 identified studies, only 8 included MBIs for people with advanced cancer rather than their families or carers. Results from these studies suggests that MBIs are acceptable and beneficial to the advanced cancer population, improving quality of life, use of mindfulness skills, acceptance of their cancer situation and reduction in depression and anxiety. Some adaptations were recommended however regarding delivery, simplified briefer MBIs, abbreviated session time, flexibility concerning locality of treatment and a minimized questionnaire burden for this group. **Conclusions:** MBI packages reviewed in this study had evidence of acceptability and of effectiveness, indicating potential benefit for this population. Individualized, including home-based interventions may be optimal to allow critically ill patients to participate in treatment. In future, MBIs adapted to the needs of various advanced cancer patients are recommended to address the gap in the field and improve health care.

**INSPIREHEALTH'S INTERPRETATION:** Mindfulness-Based Stress Reduction (MBSR) is an eight-week program initially developed by Jon Kabat-Zinn to support people living with chronic illnesses, including cancer. Mindfulness-based interventions (MBIs) have been examined for use among cancer patients, though very few studies have been conducted with a population of advanced cancer patients. Practicing mindfulness according to these programs involves non-judgemental observation of changing stimuli such as thoughts, emotions, memories, sensations, among others. Simply, it is the practice of living within the present moment. This paper provided a synthesis of studies related to MBIs among cancer patients with stage III and IV diagnoses. Eight studies which collected data from 456 cancer patients were included. While the exact techniques employed in the studies differed from one another, they all included a mindfulness component, and other techniques including yoga, body scans, and cognitive therapy. Studies measured quality of life, mental health, and mindfulness outcomes. Overall, large effects were seen on outcomes such as quality of life, self-compassion, tendency to be kind and understanding, depression and anxiety. Medium effects in reducing negative emotions, increased mindfulness skills, improved general well-being and relaxation, and mood were found. Overall, this paper supports the use of MBIs for patients with advanced cancers. InspireHealth offers individual and group programming which can support these skills.

**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; Emily Medd, MSc; Lynda Soberanes, MSc, RD; and Zahra Tromsness, MHSc, RD. For more information, email [info@inspirehealth.ca](mailto:info@inspirehealth.ca)

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