

Naturopathic Considerations in Supporting Older Adults with Cancer

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Abstract:

When supporting the older adult with cancer, it is essential to account for the unique concerns within this population beyond cancer type and stage. Common concerns in this population include numerous comorbidities, polypharmacy, nutritional status, treatment tolerance, pain management and quality of life. A comprehensive geriatric assessment is essential for elucidating salient concerns among older adults with cancer as it reduces the risk of treatment toxicities and improves treatment outcomes. Using the results of geriatric assessments, naturopathic doctors can recommend therapies to optimize quality of life and prognosis, specifically in the older adult population with cancer.

Cancer has a disproportionate impact on older Canadians. Approximately 60% of cancers are diagnosed in those 65 years of age or older, with 70% of cancer-related deaths in this age group.^{1,2} In the context of this article, older adults will refer to those aged 65 years and older. Compared to their younger counterparts, cancer incidence is 11-fold higher in this group; additionally, they have a 16-fold greater age-adjusted cancer mortality rate.^{3,4} Despite the high burden of cancer in older adults, there is a lack of evidence regarding the optimal treatment approach for these patients due to their under-representation in clinical trials.³ For example, randomized trials on many chemotherapy regimens exclude those with multiple comorbid conditions, and as a result, few trials enroll older adults.² The lack of cancer studies including older adults is problematic as they have an increased risk of toxicity from cancer treatments combined with a shorter life expectancy. Together these factors can significantly affect the risk-benefit profile of treatment options in this population.^{2,5} It therefore becomes important to determine the optimal treatment approach in older adults by completing careful assessments at the outset of cancer treatment planning.⁶ In oncology, the comprehensive geriatric assessment (CGA) is the application of various validated geriatric assessment tools to evaluate the older adult's capacity to tolerate treatment and the probability that the patient will experience and recuperate from its adverse effects.⁴ Such assessments also allow for the identification of patients who may have a greater likelihood of functional decline and mortality.⁶ Thus, healthcare practitioners can identify vulnerable patients and implement measures to improve outcomes.⁴ In this way, completing a CGA provides essential information beyond chronological age, cancer type and stage. With a better understanding of a patient's functional age, the CGA allows the conventional oncology team to recommend a treatment plan that will best meet an older adult's individual needs.⁷ Naturopathic

doctors supporting people with cancer can also use these results to tailor their integrative treatment approach. This article will review the unique challenges that older adults with cancer may experience, including an increased likelihood of treatment toxicities and the presence of risk factors that may lead to worse outcomes.⁵ Completing a geriatric assessment to identify these challenges and subsequently inform treatment planning in this population is an important part of caring for older adults with cancer.⁴ We will also discuss the evidence for some of the naturopathic treatment options to optimize our patients' quality of life and treatment outcomes.

A CGA consists of validated instruments intended to assess the degree of physical functioning, social supports available, cognitive performance, mobility and balance, mental-emotional health, malnutrition/sarcopenia and comorbidities.⁸ One example of a validated assessment tool used as part of a CGA is the Mini Mental Status (MMS) to evaluate cognitive difficulties or the use of the Timed Up and Go (TUG) test to assess mobility and risk of falls.⁴ A full assessment of the geriatric patient would also include an evaluation of their current medications, economic status, physical environment, and caregiver support.⁹ Moreover, the CGA assesses common geriatric syndromes, including frailty, dementia, syncope, delirium, falls, dizziness and sleep disorders.¹⁰ A geriatric assessment also reveals polypharmacy, which is a particular concern in this population, given the potential interactions between the cancer treatments and the medications used to manage their adverse effects, with existing prescriptions for other co-morbidities.¹¹ Polypharmacy in older adults with cancer increases the risk of adverse events in an already vulnerable population.¹²

Completing a CGA in people with cancer aged 57 to 94 led to a reduction in the intensity of the treatment regimen among 42%

of participants, more intensive intervention in 39% of patients, and supportive care alone in 19% of the study population.⁸ Thus, completing a CGA can reduce treatment intensity in more vulnerable patients while avoiding under treatment in those who are fit to tolerate more intensive therapy.⁸ Most importantly, the effects of performing a CGA on clinical outcomes have been demonstrated for the first time in three recent randomized clinical trials¹³⁻¹⁵ presented at the 2020 American Society of Clinical Oncology annual meeting. These studies clearly show that the CGA not only improves quality of life and reduces high-grade chemotherapy toxicity but also significantly decreases treatment discontinuation, hospital utilization, and unplanned hospital admissions compared to usual care. Despite the benefits of completing a geriatric assessment, it is still not common practice for older patients with cancer to undergo routine CGA.¹⁶ This is likely due to multiple factors, including lack of awareness of the recent development of practice guidelines, inadequate staffing, and insufficient financial reimbursement for completing these assessments.¹⁶ Although naturopathic doctors in Canada are not typically engaged in conventional cancer treatment planning, we should help advocate for our older patients to undergo CGA by their oncology team. For example, naturopathic doctors can consider completing assessments that are part of the standard CGA such as the Mini Mental State or the Timed Up and Go in office and communicating the results as part of their correspondence with the patient's oncologist.

Naturopathic Interventions:

Secondary Sarcopenia/Cancer Cachexia

Sarcopenia is a gradual decline in muscular strength due to a reduction in skeletal muscle mass and quality.¹⁷ The prevalence of sarcopenia ranges from 5-13% in people aged 60-70 years, and it can be up to 50% in those over the age of 80.¹⁸ The severity of sarcopenia in older adults is further compounded by cancer therapies as well as the presence of cancer itself in the body. For example, hormone deprivation therapy for the treatment of prostate cancer can cause a significant reduction in muscle mass¹⁹ and treatment with chemotherapy can also drive sarcopenia progression.²⁰ Sarcopenia is a hallmark feature of cancer cachexia, a metabolic syndrome arising from a cytokine-mediated loss of muscle mass, with or without a loss of fat mass.²¹ In a state of cancer cachexia, pro-inflammatory and catabolic cytokines are released by the tumour and its microenvironment,²² leading to systemic inflammation, increased protein breakdown and decreased protein synthesis. These changes, in turn, also cause clinical symptoms such as loss of appetite and reduced food intake resulting in further loss of muscle mass. Thus, while older adults are already at higher risk of experiencing sarcopenia, that risk is significantly increased in the cancer setting.²³

Low muscle mass is associated with reduced tolerance to chemotherapy, greater chances of postoperative complications, a reduction in performance status, a decline in psychological well-being and cancer-related fatigue.²³ Most importantly, loss of muscle mass has also been associated with a decrease in overall quality of life

and survival in people with cancer.²⁴ Therefore, it is important to carefully monitor weight loss, muscle mass and nutritional status in older patients with cancer.

Several integrative interventions may help maintain weight and muscle mass during cancer treatment, including omega-3 fatty acids, L-carnitine, and vitamin D. Eicosapentaenoic acid (EPA) is an omega-3 fatty acid derived from fish and algae sources.²⁵ EPA reduces TNF-alpha levels thereby mitigating inflammation-mediated damage to skeletal muscle while enhancing its insulin sensitivity and facilitating the uptake of proteins.²² The benefits of supplementing omega-3 fats during cancer treatment have been demonstrated in several studies of people with lung cancer, a condition commonly associated with cachexia. For example, in patients receiving chemo-radiotherapy, the concurrent administration of 1 g per day of EPA resulted in significantly better weight maintenance.²⁶ Another study found that supplementing with 2.02 g EPA and 0.92 g DHA, another marine sourced omega-3 fatty acid, significantly improved quality of life and physical and cognitive function.²⁷ Yet another trial demonstrated that a greater proportion of those who supplemented EPA at 2.2 g per day alongside their chemotherapy regimen maintained or gained weight compared to those in the standard of care group who lost an average of 2.3 kg.²⁸ Additionally, omega-3 fat intake may also improve response to cancer treatment. Supplementation with 2.5 g of combined EPA and DHA per day resulted in a better response rate and clinical benefit in patients with lung cancer receiving palliative chemotherapy.²⁹ Similarly, supplementation of 0.6 g of combined EPA and DHA in people with colorectal cancer receiving chemotherapy increased time to tumour progression.³⁰

L-carnitine deficiency has been described in older adults and is characterized by fatigue, muscle wasting, and geriatric frailty.³¹ Low levels of L-carnitine contribute to cachexia in older adults with cancer³² by upregulating inflammatory pathways that mediate the loss of lean body mass.^{33, 34} People with pancreatic cancer who supplemented with 4 g per day of L-carnitine along with gemcitabine chemotherapy displayed a significant increase in their BMI compared to a reduction in the control group receiving gemcitabine therapy alone.³³ The group receiving L-carnitine also showed a trend towards increased survival, although this was not statistically significant.³³

Vitamin D is another nutrient that may help mediate inflammatory processes that expedite the muscle wasting observed in cancer cachexia. A study including people with colorectal adenomas found that the supplementation of 800 IU of Vitamin D per day for six months resulted in a significant reduction in inflammation as measured by CRP, TNF- α , IL-6, IL-8, and IL-1 β levels.³⁵ By alleviating inflammation, vitamin D sufficiency has been shown to enhance survival across various cancer types due to its protective effects on skeletal muscle mass.^{35,36} Moreover, vitamin D may also help mitigate the adverse effects of some cancer treatments such as endocrine therapy. For example, people with breast cancer who had vitamin D levels <100 nmol/L experienced increased aromatase inhibitor-associated arthralgias.³⁷ Joint pain improved in those who

reached serum levels of vitamin D of at least 100 nmol/L.³⁸ Lower vitamin D status at baseline may also be predictive of a greater risk of developing post-radiation esophagitis and emesis³⁹ as well as the severe colitis associated with immunotherapy.⁴⁰

In addition to implementing therapeutic strategies to protect muscle mass, it is also important to address barriers to adequate caloric consumption. Many antineoplastic therapies result in side effects that adversely affect appetite and digestion, resulting in decreased energy intake. Compared to their younger counterparts, older adults who present with frailty are more likely to experience complications from various cancer therapies⁴¹ that can affect nutritional intake such as nausea and vomiting, oral mucositis, taste changes and dry mouth. The following sections will describe naturopathic interventions that can be beneficial in alleviating these side effects.

Nausea/Vomiting

It is estimated that approximately one-half of people with cancer will experience nausea and vomiting either due to treatment, as a side effect of the cancer itself, or other reasons including anxiety or pain.⁴² Despite progress in the development of antiemetic drugs, up to 60% of patients experience chemotherapy-induced nausea and vomiting (CINV).^{43,44} If left untreated, CINV causes physical discomfort, dehydration, fatigue, and adversely affects quality of life.^{45,46} In more severe CINV cases, the chemotherapy regimen may require dose reduction or delay, compromising patient outcomes.^{47,48} In a meta-analysis of ten randomized controlled trials, ginger was effective in controlling chemotherapy-induced nausea and vomiting, particularly acute vomiting with the dose ranging from 0.5 to 2.0 g per day.⁴⁹ Thus, ginger may be a beneficial adjunctive therapy among older adults undergoing conventional anti-cancer treatment.

Oral Mucositis

Older adults also experience an increased sensitivity to oral toxicity of cancer treatments.⁵⁰ Oral mucositis can be a side effect of chemotherapy drugs interfering with DNA synthesis, such as fluorouracil.⁵¹ Mucositis is especially common when a cytotoxic agent such as cisplatin is combined with radiation therapy directed to the head and neck area.⁵² Chemotherapy and radiation therapy both negatively affect normal cell turnover of the mucosal epithelium, leading to the damage of these tissues.⁵³ Oral mucositis can be quite painful, and it may reduce patients' tolerability of conventional treatments, leading to a reduction in oral intake, malnutrition, and dehydration.⁵³ L-glutamine is a natural agent that can be helpful in the prevention and management of oral mucositis. It is the primary fuel source for cells that line the digestive tract, thereby maintaining healthy oral mucosa.⁵⁴ A systematic review on oral L-glutamine for the prevention of chemo- and/or radiation therapy-induced mucositis demonstrated a reduction in the severity and duration of mucositis with L-glutamine supplementation.⁵⁵ L-glutamine supplementation was also shown to be effective at preventing weight loss.⁵⁵

Taste Alterations

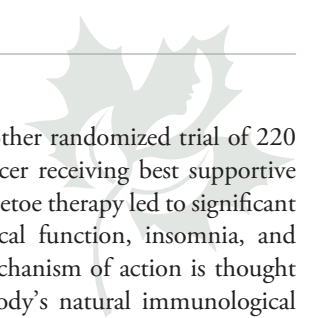
In addition to oral mucositis, taste alterations due to cancer treatment may also impact nutritional intake. Up to 70% of people with cancer experience taste alterations while undergoing chemotherapy.⁵⁶ Taste changes can significantly affect quality of life, leading to malnutrition, fatigue and potentially decreased survival.⁵⁷ Zinc plays a key role in taste perception, and there is evidence that depletion of this micronutrient may be linked to taste changes among cancer patients.⁵⁸ Moreover, some chemotherapy drugs bind and chelate zinc, leading to deficiency and consequent taste alteration.⁵⁹ Radiation therapy may also affect taste perception, which is a frequent side effect amongst people with head and neck cancer.⁶⁰ While some people may recover their normal sense of taste six months to one year following treatment completion, others may experience permanent taste impairment.⁶⁰ These changes in taste perception due to treatment may be especially detrimental in the older cancer patient population, who may already experience age-related changes in taste and smell as part of the normal ageing process.⁶¹ Zinc supplementation (50 mg, three times daily) throughout radiation therapy and for one month following treatment completion among people with head and neck cancer has been found to prevent changes in taste perception.⁶² Another trial investigating the effects of zinc L-carnosine among people with head and neck cancer receiving chemoradiotherapy found significantly reduced rates of taste disturbance, mucositis, pain, xerostomia and pain as compared to control. Caloric intake was significantly higher, and analgesic use was significantly lower in those receiving zinc L-carnosine.⁶³ Thus, zinc should be considered as part of a supportive care plan to help mitigate taste disturbances among older adults with cancer.

Xerostomia

Xerostomia, or dry mouth, is another distressing side effect of radiotherapy.⁶⁴ Approximately 70% of patients receiving radiotherapy to the head and neck develop hyposalivation, increasing the risk of oral infections and causing difficulties chewing and swallowing.⁶⁵ Xerostomia may last anywhere between six months to several years following the completion of radiation therapy.⁶⁶ Acupuncture may be an effective integrative strategy to prevent and treat xerostomia in patients with head and neck cancer. A systematic review of four clinical trials concluded that acupuncture was associated with objective improvement in salivary flow rates in addition to significantly improved scores for dry mouth.⁶⁷ An additional study found that acupuncture significantly reduced patient reports of sticky saliva, needing to sip fluids to swallow food and night awakenings to drink fluids.⁶⁸ General recommendations for managing xerostomia include sipping water throughout the day, chewing sugar-free gum, and using a humidifier to keep room air moist. Avoiding caffeine and alcohol-based mouthwashes in addition to chewing sugar-free gum and taking frequent sips of water also alleviates discomfort and helps maintain quality of life.⁶⁹

Pain Management and Quality of Life

It is important to ensure that older people with cancer receive appropriate recommendations for pain management. A meta-analysis of over 100 studies found a 55% prevalence of pain during cancer treatment and a 66% prevalence in the setting of advanced,



metastatic, or terminal disease.⁷⁰ There are several unique challenges in terms of pain management among older people with cancer. Most older adults believe that pain is to be expected as part of the ageing process and thus may not communicate openly with their healthcare providers.⁷¹ Moreover, cognitive impairment can also influence the assessment and management of pain in the older adult patient population.⁷² To better understand the patient's pain experience, a caring and trusting therapeutic relationship between healthcare providers and older patients is essential.

Naturopathic doctors can also offer cancer-related pain management support through physical modalities such as acupuncture and massage therapy. Acupuncture has been shown to alleviate pain by enhancing the binding of Mu-opioid receptors in several pain and sensory processing areas of the brain.⁷³ In one study, those who received acupuncture treatments concurrently with their regular pain medication reported reduced discomfort compared to those who were only given analgesics.⁷⁴ A meta-analysis found that acupuncture may help alleviate cancer-related pain in the palliative care setting.⁷⁵ Additionally, a systematic review concluded that massage therapy is also beneficial in alleviating pain in addition to nausea, anxiety, stress and fatigue among palliative care patients.⁷⁶

Mistletoe, a semi-parasitic plant, is another important therapy for managing pain and enhancing quality of life among older adults with cancer. Mistletoe is widely used as an integrative cancer therapy in Europe, especially Germany.⁷⁷ One trial assessed 95 breast cancer patients undergoing chemotherapy who were given subcutaneous mistletoe injections three times per week compared to those who received chemotherapy alone.⁷⁸ Those receiving mistletoe injections experienced a significant improvement in their pain, nausea, vomiting,

insomnia and loss of appetite.⁷⁸ In another randomized trial of 220 patients with advanced pancreatic cancer receiving best supportive care, the addition of subcutaneous mistletoe therapy led to significant improvements in pain, fatigue, physical function, insomnia, and nausea and vomiting.⁷⁹ Its primary mechanism of action is thought to be through enhancement of the body's natural immunological defences against tumour cells.⁸⁰ Additionally, mistletoe extracts have anti-inflammatory effects accounting for their beneficial effects on cancer-related pain and fatigue.^{81,82} Given the importance of maintaining quality of life⁸³, mistletoe therapy becomes another important consideration among older adults with cancer.

With the total number of older adults with cancer expected to reach two billion⁸⁴ by 2050, cancer is an ever-increasing health concern within the ageing population. Given the unique health challenges within this age group, healthcare providers must take a thorough and individualized approach in supporting older adults with cancer. The CGA is a useful tool to help identify the unique aspects of care that must be considered when working with older adults with cancer.^{8, 13-15} Naturopathic doctors can also use information derived from a CGA to intervene with therapies that can positively impact quality of life and prognosis. For example, nutritional supplements such as omega-3 fatty acids, L-carnitine, and vitamin D may all help improve body composition, quality of life and prognosis during treatment.^{26-38, 40} L-glutamine, zinc and acupuncture may help to mitigate side effects of chemotherapy that compromise caloric intake and nutritional status.^{54, 55, 62, 67, 68} Acupuncture, massage, and mistletoe therapy can be used to improve cancer pain and quality of life.^{74-76, 78, 79} Given the complex nature of managing older adults with cancer, naturopathic doctors play a vital role in the holistic treatment of this population to ensure optimal outcomes. 🍂

Condition/side effect	Intervention	Dose range	Reference
Secondary sarcopenia/ cachexia	Omega-3 fatty acids	2.02g-2.2g EPA and 0.92g DHA	27, 28
	L-carnitine	4g/day	33
Nausea/vomiting	Ginger	0.5-2.0g/day	49
Oral mucositis	L-glutamine	10g three times daily	55
Taste alterations	Zinc sulfate	50mg three times daily	62
	Zinc L-carnosine	Oral rinse for 3 minutes, 4 times daily	63
Xerostomia	Acupuncture	Common points include LI2, LI4, LI20, ST6, ST36, SP6, LU7, KD6, CV24, GV20, and auricular points salivary gland 2, point zero, and Shen Men	67, 68
Pain management/ quality of life	Mistletoe	Type and dosing schedule specific to the cancer type, stage, and treatment, as well as the patient's performance status	78, 79

About the Authors

Sukriti Bhardwaj, ND practices as a resident naturopathic doctor at the Integrative Cancer Centre within the Canadian College of Naturopathic Medicine. After various research experiences during her undergraduate degree focused on topics in naturopathic medicine and oncology, she developed a strong interest in both fields, which inspired her to pursue residency training in naturopathic cancer care. In her clinical practice as a resident, she focuses on supporting people with cancer while engaging in research activities to contribute to literature in the field of integrative oncology.

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