

## Education Update

By Dr. Sian Shuel,  
Medical Education Lead, FPON

BC Cancer's Family Practice Oncology Network is enthusiastically working on educational offerings for the coming months. The fall line-up kicked off with the September 16 CME webcast entitled 'Beyond Angelina Jolie: Diagnosis and Management of Hereditary Breast and Ovarian Cancer Syndrome'. The webcast series will also include 'Immization in Childhood Cancer' in October followed by 'Follow-up Care of Patients with Indolent Lymphoma' in November, and Case Studies in Cancer Related Thrombosis in January 2022. Stay tuned to fpon.ca for February's webcast and beyond. This complimentary, accredited webcast series takes place between 8 a.m. and 9 a.m. PST, the third Thursday of most months (except July, August and December) and is offered in partnership with UBC Continuing Professional Development.

September 2021 will also see the third virtual instalment of General Practitioner in Oncology (GPO) Education. This program includes a two-week didactic introductory module, followed by 30 days of flexibly scheduled clinical rotation at the regional BC Cancer Centre where the GPO's patients are referred. Traditionally held in person, GPO Education was converted to a virtual format during COVID, balancing the need for ongoing education of new GPOs with safety standards. One benefit of the virtual delivery is that it enables GPOs throughout BC and Yukon, including those in rural and remote areas, to take specific sessions as a refresh without leaving their home community, an essential option

*continued on page 2*

## Changes in the landscape of treatment for unresectable/metastatic lung cancer in 2021

By Dr. Jenny J Ko

Lung cancer is one of the most common cancers in Canada.<sup>1</sup> In 2020, 3855 patients in BC were newly diagnosed with lung cancer, representing 13% of all cancer cases.<sup>2</sup> Lung cancer is projected to continue being the leading cause of cancer death in Canada in 2020, accounting for 1 in 4 of all cancer deaths. At 19%, the five-year net survival for lung cancer is among the lowest of all types of cancer.<sup>2</sup> Non-small cell lung cancer (NSCLC) is the most common type of lung cancer (80%), and it includes subtypes such as adenocarcinoma, squamous cell carcinoma, and large cell carcinoma. Small cell lung cancer (SCLC) comprises approximately 20% of all lung cancer cases.

Approximately 50% of patients presenting with lung cancer are diagnosed with stage IV or metastatic disease.<sup>2</sup> Of those with metastatic disease, only 20-25% of patients are well enough to see oncologists and

to receive systemic therapy.<sup>3,4</sup> With an estimated cost to Canada's publicly funded healthcare system of \$2 billion in 2020, lung cancer is one of the costliest cancers.<sup>5,6</sup> This represents an average of about \$70,000

per lung cancer case,<sup>1</sup> not including the financial impact on the individual and their family.

The landscape of treatments for unresectable/metastatic NSCLC have undergone a significant change in the last few years. Chemotherapy alone is no longer considered standard of care in almost all patients.

Detection of potentially

actionable mutations screened by immunohistochemistry or by genome sequencing, is an important first step. These include mutations and/or fusions in the oncogenes such as epidermal growth factor receptor (*EGFR*), anaplastic lymphoma kinase (*ALK*), *ROS-1*, *RET*, *MET*, *BRAF*, *KRAS G12C*, and *NTRK*.<sup>7</sup> with at least one found in the

*continued on page 3*



Dr. Jenny J Ko

## BEST PRACTICE CANCER CARE GEMS

- 1 Lung cancer: treatment update
- 2 Lung cancer guideline
- 3 CFPC member interest group update
- 4 Smoking cessation in cancer care
- 6 Preventable adverse drug events: a primary care case study
- 8 Interventional oncology: common procedures and their applications
- 10 Exercise and cancer
- 12 Radiotherapy side effects: clinical gems for practice
- 14 COVID 19, cancer screening & personal health risk assessment

# GPAC Primary Care Lung Cancer Guideline NOW available

Dr. Cathy Clelland

Chair Lung Cancer Guideline Working Group

Over the past decade, the BC Cancer Primary Care Program/Family Practice Oncology Network has worked extensively with the Guidelines and Protocol's Advisory Committee (GPAC) on the development of primary care cancer guidelines, such as those for breast, colorectal and prostate cancer. These guidelines have been developed to reinforce best practices in cancer care including assessment of risk factors, screening (where available), early detection, referral and follow-up recommendations including advance care planning. The guidelines are intended to support primary care providers when caring for patients along the cancer care journey. The most recent addition to this section of guidelines is for lung cancer, which was approved by the Medical Services Commission in June 2021.

A working group was established to review evidence and develop a first draft. This group consisted of a medical oncologist, radiation oncologist, thoracic surgeon, respirologist, rural FP, urban FP, GP in oncology (GPO), a consultant writer and research evidence methodologist, and was chaired by the Medical Director for BC Cancer's Primary Care Program with medical and staff support from GPAC. With permission, we began the work using a relevant Cancer Care Ontario (CCO) guideline (Referral of Suspected

Lung Cancer by Family Physicians and Other Primary Care Providers) as a starting point. Using a formal guideline adaptation process, the lung cancer guideline was developed following the primary care patient journey from initial diagnosis, referral, and post treatment follow-up. Active treatment of lung cancer was not addressed in this guideline as that is outside the scope of primary care management. For more information on treatment specific details of oncology management, please refer to the Cancer Management Guidelines on the BC Cancer website ([www.bccancer.bc.ca/health-professionals/clinical-resources/cancer-management-guidelines/lung/lung#Management](http://www.bccancer.bc.ca/health-professionals/clinical-resources/cancer-management-guidelines/lung/lung#Management)).

While in BC there is currently no publicly funded lung cancer screening program, during the development of this guideline, the BC Minister of Health announced approval of the first high-risk lung cancer screening program in Canada to be implemented in 2022. The work on the implementation details of this newest addition to the BC Cancer Screening program is well underway. Once finalized, the primary care lung cancer guideline will be revised to reflect the screening program specifics along with any tools developed for primary care providers.

The creation of this guideline was made possible thanks to partnership from the BC Cancer Foundation to support non physician costs, while compensation for physicians' time came from Health System Redesign funds held by the Provincial Health Services Authority.

The guideline is now posted on [BCGuidelines.ca](http://BCGuidelines.ca) to help guide physicians and patients through their journey.

Future plans include working with UBC's Division of Continuing Professional Development (UBC CPD) within the Faculty of Medicine, to create an online self-directed educational module for lung cancer to add to the existing "Primary Care Learning Session Modules" library available through the CME section of the [FPON.ca](http://FPON.ca) website. This module will explore best practices in testing, diagnosis, treatment, survivorship, surveillance and late effects. It will then become another topic for the small group virtual learning sessions that are being developed using a case-based approach to further promote and deliver the guideline as broadly as possible for all BC primary care physicians.



## Education Update continued from page 1

given the rapidly changing landscape of oncology therapeutics. Moving forward, FPON plans to run the spring sessions virtually to allow for this refresh option while the fall sessions are planned for in-person delivery starting fall 2022.

Completing the GPO Education Program is a requirement for family physicians newly hired as GPOs in BC and the Yukon (both within community cancer clinics and at BC Cancer Centres). The program provides an opportunity to gain the foundational knowledge, skills, and confidence to administer systemic therapy and to provide supportive care to cancer patients and their families.

Fall 2021 will also see the return of GPO Case Study Day as part of BC Cancer's Virtual Summit. Planned for November 20, 2021, from 8:30 to noon, this accredited, interactive case-based series will include case presentations on topics chosen by GPOs in BC and Yukon. Topics such as 'What's New in Systemic Therapy for the GPO', TBC, 'Immunotherapy Related Endocrine Toxicities for the GPO' and 'Less Common but Relevant Immunotherapy Related Toxicities for the GPO' will be covered. GPOs from BC and Yukon are presenting and are supported by an endocrinologist and medical oncologists. Opportunity to network with GPOs will be built into the program as well.

Early 2022 will see a continuation of the monthly CME webcasts and an Oncology CME Day for Primary Care Practitioners. Being held virtually on April 2, 2022, during Cancer Awareness / Daffodil month and offered in partnership with UBC Continuing Professional Development, the line-up will include topics particularly relevant for Primary Care.

More information on FPON's educational offerings and registration details, can be found at [fpon.ca](http://fpon.ca). We are always seeking feedback from our readers and participants on oncology topics of interest to you. Please email FPON's Medical Education Lead at [sian.shuel@bccancer.bc.ca](mailto:sian.shuel@bccancer.bc.ca) with topic suggestions.

# CFPC Cancer Care Member Interest Group: A Cross-Canada Collaboration

By Dr. Sian Shuel,  
Medical Education Lead FPON



The College of Family Physicians of Canada (CFPC) currently has more than 38,000 members and created member interest groups (MIGs), including the Cancer Care



Cancer Care

MIG, to help provide a 'professional home for all family physicians across diverse interests, settings and practice types'.<sup>1</sup> The MIGs Strategic Plan includes a vision of 'family physicians of all

professional interests working together to support each other and the practice of family medicine.' The mission is to link 'members across Canada who have a similar area of practice interest. By fostering professional collaboration and peer connections on

practice topics, the Section supports (family physicians) and (their) work while advancing the practice of family medicine to meet the health care needs of Canadians.'

With this mission and vision in mind, the Cancer Care MIG connects family physicians with interest in cancer care to share information, connect and collaborate on projects relevant to family medicine in Canada. To this end, five members of the Cancer Care MIG, including physicians from British Columbia, Alberta, Quebec and Ontario, are currently working together to develop a cancer care podcast mini-series. The first two, 'Diagnosis of Cancer- an Approach for Family Physicians' and 'Survivorship:



Dr. Sian Shuel

Cognitive and Psychosocial Impacts for Cancer Survivors' have been released. Another two podcasts, 'Survivorship: Cancer Surveillance and Recurrence Prevention' and 'Survivorship: Late and Lasting Effects of Treatment', will be released shortly.

To access the series, visit <https://cfpclearn.ca/> and register for a free CFPCLearn account. Physicians will have three months to access the webinars and podcasts for free before a subscription to CFPCLearn is required to view the series.

Contact Dr. Sian Shuel at [sian.shuel@bccancer.bc.ca](mailto:sian.shuel@bccancer.bc.ca)

## Reference

1. College of Family Physicians of Canada. Member Interest Groups Section Strategic Plan 2020–2025. Mississauga, ON: College of Family Physicians of Canada; 2020.



*Unresectable/metastatic lung cancer in 2021 continued from page 1*

tumour samples of approximately 15-20% of patients with adenocarcinoma. If found, these predict that a targeted inhibitor of the specific gene may induce response and potentially improve survival. Targeted treatments are generally given as oral agents and are well tolerated with the potential to significantly improve life expectancy in the order of years. The median overall survival (OS) on the third-generation EGFR tyrosine kinase inhibitor (TKI), reported by the FLAURA trial, was 38.6 months, from the time of first-line treatment to death.<sup>8</sup>

For those with unresectable/metastatic NSCLC without these mutations, combination of immunotherapy and chemotherapy is the current standard of care.<sup>7</sup> In July 2021, BC Cancer approved public funding of pembrolizumab and platinum doublet chemotherapy, and other combinations may follow. For those who have unresectable/metastatic NSCLC with programmed death (PD)-ligand (L)1 level of 50% or greater, pembrolizumab alone

is an acceptable first-line treatment with reported median OS for these patients of 26.3 months.<sup>9</sup> Legacy patients who did not receive immunotherapy in the first-line setting may receive next-line immunotherapy (PD-1 or PD-L1 inhibitors). Long term follow-up data shows that approximately 20% of patients exposed to immunotherapy may continue to survive beyond 5 years from diagnosis.<sup>10</sup>

Patients with extensive SCLC have generally poor prognosis. They often present with large centrally located thoracic lesions, superior vena cava (SVC) compression, and metastases in brain, central nervous system (CNS), and liver. Chemotherapy with platinum and etoposide remains standard of care, and should be offered urgently given the rapid proliferation of SCLC and its chemosensitivity. Despite trials to show that the addition of PD-1 or PD-L1 inhibitors is associated with improved survival, no public funding for this is currently available in BC. However, chemotherapy combined with durvalumab, a PD-L1 inhibitor, has recently been recommended

for reimbursement by the Canadian Agency for Drugs and Technologies in Health.<sup>11,12</sup>

In specific situations (e.g. brain metastases, consolidative chest radiation for SCLC), other treatments to consider include palliative radiation therapy, stereotactic radiation therapy and metastatectomy. Appropriate and early palliative care and patient-reported outcome measurement and related interventions have both been shown to improve OS, and should be offered to all patients with metastatic lung cancer regardless of treatment modalities.<sup>13,14</sup>

Many new treatments are coming down the pipeline, and with the increasing treatment options, those who can receive treatment may have better quality of life and opportunities for improved survival. Multidisciplinary patient-centred care to manage the local and systemic therapies, their toxicities, and the symptoms of cancer and related psychosocial issues remain central to the optimal care of lung cancer patients.

*see References on page 17*



# Smoking cessation in cancer care

By Dr. Renelle Myers, MD, FRCPC  
Clinical Associate Professor, UBC  
Clinical Scientist, Department of Integrative  
Oncology  
Thoracic Interventional Respirologist, VCH  
Lead, BC Cancer Smoking Cessation Program  
BC Cancer Research

Cheryl Colby, BHK  
Program Manager, BC Cancer Smoking  
Cessation Program  
Health Promotion Specialist – Prevention,  
Screening and Hereditary Cancer Program  
BC Cancer

In 2014, the Surgeon General's report reviewed >400 studies reporting on >500,000 cancer patients and concluded that continuing to smoke after a cancer diagnosis increases overall mortality and cancer specific mortality. Continuing to use tobacco was also found to increase toxicity of treatments, increase risk of recurrences and increase the risk of developing a second primary. This evidence has clear clinical implications and the report concluded that

the risk of dying could be lowered by 30% by quitting smoking at the time of a cancer diagnosis. (The Health Consequences of Smoking—50 Years of Progress - NCBI Bookshelf) <https://www.ncbi.nlm.nih.gov/books/NBK179276/>



Dr. Renelle Myers

Cheryl Colby

Smoking cessation through a cancer journey will improve the patient's well-being, including a higher quality of life and improve perceived health status. Most importantly for policy makers and program implementation, smoking cessation interventions are cost

effective as demonstrated in modeling with Canadian data. (Warren et al. *Jama network open*, 2019)

Recognizing these profound benefits, as well as the lack of smoking cessation programs in cancer centres across Canada, the Pan Canadian Partnership Against Cancer (CPAC) pivoted to create a national smoking cessation working group including key stakeholders from each province and territory. This working group created a program implementation guideline which was released in 2019 (<https://www.partnershipagainstcancer.ca/topics/smoking-cessation-framework/>) CPAC also provided start up grant funding for smoking cessation programs in all provinces and territories. As of June 2021, all provinces and territories had created programs/pathways within the cancer patient journey for smoking cessation. The goal was to develop programs with reach and accessibility, as well as effectiveness using culturally competent approaches and sustainability planning.

To understand the impact of such a new program at BC Cancer, an environmental scan was conducted to identify current tobacco users presenting as a new patient at all 6 centres. The numbers revealed smoking rates as high as 25% in the centre for the North, 19% in Southern Interior, 18% in Abbotsford, 15% in Fraser Valley and 13-16% in Vancouver and Vancouver Island.

The significance of the data from this environmental scan, allowed us to launch the BC Cancer smoking cessation program in 2019, across all 6 cancer sites in the province, changing our standard of care to address tobacco use in all cancer patients. The AAR (Ask Advise, Refer) opt out method was adopted. All patients attending a new clinic visit are asked about active tobacco use, and if identified as actively using tobacco within the last 3 months, are advised about the benefit of quitting in the setting of cancer. They are then automatically referred to the provincial quit line "QUITNOW" where a cessation counsellor will contact them within 3 days to introduce the program and offer them counselling for cessation. In addition, they will educate them on how to access free nicotine replacement through the provincial cessation program.

From Sept 2019 to Dec 2020, we have

*continued on page 5*

## 5 REASONS TO QUIT SMOKING AFTER A CANCER DIAGNOSIS

**1 BETTER CHANCE OF SUCCESSFUL TREATMENT.**  
Quitting smoking makes your cancer treatment more effective.

**2 FEWER SIDE EFFECTS.**  
You'll have a lower chance of developing side effects, such as infection, fatigue, and nausea.

**3 FASTER RECOVERY.**  
Your body will heal faster and you'll spend less time in the hospital.

**4 LOWER RISK OF SECONDARY CANCERS.**  
Smoking increases the likelihood of your cancer returning or developing new cancers in the future.

**5 IMPROVEMENT IN QUALITY OF LIFE.**  
Live longer and better by making it a goal to quit smoking.



FOR RESOURCES TO HELP YOU QUIT SMOKING, GO TO

**BCCANCER.BC.CA**



Smoking cessation in cancer care  
continued from page 4

identified 874 patients at BC cancer who are current tobacco users and we have referred 367 of those patients to QuitNow. (See table 1) 44% of patients referred, made quit attempts and 52% reduced consumption of tobacco.

Table 1 demonstrates (by centre) the number of active smokers identified and how many of those patients were referred to QuitNow. The data collected is based on the new patient intake form and must have been faxed into the BC Cancer smoking cessation program to have been recorded.

We are continuing to collect data via patient call backs at 30 days, 6 months and 12 months. This data allows us to collect cessation rates for evaluation of effectiveness of the program and will be ongoing. Continued evaluation of our program is imperative as we strive to improve our data collection results for the # of smokers identified and the # of smokers referred to the quit line as well as the patients' experience in order to improve the health outcome of our patients.

### Quitting Smoking is one of the best things a patient can do to help their cancer treatment work better

The importance of quitting smoking at the time of a cancer diagnosis can significantly impact the patient's cancer and treatment related outcomes. It is important that everyone involved in the patient's care help to provide the support, encouragement and education needed to help reduce the impact of smoking on the patient's health and should be viewed as part of their treatment. Studies show that through counselling and pharmacotherapy, patients are more successful and abstain from smoking longer. CAN-ADAPTT-Canadian Smoking Cessation Clinical Practice Guidelines A Canadian Study performed at Princess Margret Cancer Centre in Toronto (Table 2) demonstrated that patients want to be asked about their smoking history and feel that it is important that their providers know about their tobacco use. (L Eng et al. ESMO Sept 2017), the same study demonstrated that a large portion of patients are unaware of the benefits of quitting at the time of a cancer diagnosis.

Our program is focused on identifying patients who use tobacco, empowering them with education on the importance of quitting, then providing them with tools to quit.



The Pan Canadian Vision statement at the heart of all programs' states: "our vision is that every patient with cancer across Canada receives support to quit smoking for the best treatment and quality of life".

**Table 1**

Smoking cessation report, September 2019 to December 2020, number of new patients (NP's), number of PRISMs received, number of smokers identified, and number of referrals to the quit line (QuitNow).

Indicators	Facility					
	AC	CN	FV	SI	VA	VI
<b>NPs (N)</b>	2850	1414	4541	4256	7630	5737
<b>PRISMs</b>	1415	1174	1011	642	475	1429
<b>N (%)</b>	(49.7%)	(83.0%)	(22.3%)	(15.1%)	(6.2%)	(24.9%)
<b>Smokers</b>	208	218	140	97	35	176
<b>N (%)</b>	(14.7%)	(18.6%)	(13.9%)	(15.1%)	(7.4%)	(12.3%)
<b>Referred</b>	77	73	77	39	10	91
<b>N (%)</b>	(37.0%)	(33.5%)	(40.2%)	(40.2%)	(28.6%)	(51.7%)

**Table 2**

Most patients feel assessment is important and should at least be done at first visit.

Question	All Patients	Current Smokers	Ex/Never Smokers	P Value
Should smoking status be assessed at the first visit?	95%	89%	97%	0.003
Should smoking status be assessed at every clinic visit?	58%	51%	60%	0.09
I am comfortable with health care providers asking me about my tobacco use	96%	88%	98%	<0.001
I feel that it is important that health care providers know if I use tobacco	98%	99%	98%	0.37

Beyond best practise for patients we, must consider the economic impact of continued smoking with cancer treatment and realize the implications not only for the patient's health and ongoing treatment but for the economic impact on our publicly funded health care system as a whole.

For information about the BC Cancer Smoking Cessation Program, please contact program manager Cheryl Colby ccolby@bccancer.bc.ca

see References on page 17



# Preventable adverse drug events: a primary care case study

By Jane de Lemos  
Clinical Pharmacy Specialist  
Richmond Hospital

A 70-year-old patient with multiple myeloma presented to the Emergency Department (ED) with a one-day history of presyncope and seven-day history of dizziness. The patient had received two cycles of systemic therapy with bortezomib, cyclophosphamide and dexamethasone.

The patient's initial blood pressure (BP) in the ED was 95/60 mmHg but worsened to 60mmHg systolic with HR 85 bpm. Her serum creatinine was 1150 micromol/l (172 micromol/L one month prior). The patient received 3L normal saline intravenously, norepinephrine was initiated for hemodynamic support, and the patient was transferred to the intensive care unit.

Other medical conditions included: Pulmonary embolism one month prior, hypertension and stable Crohn's disease. Other medications taken without any recent changes were: apixaban 5mg bid, losartan 50mg daily, valacyclovir 500mg daily (for varicella zoster virus prophylaxis while on bortezomib), zoledronic acid, mesalazine and loperamide.

Further history revealed watery diarrhea for the past two weeks, which the patient felt was different from her usual Crohn's disease. The patient's severe acute kidney injury and hypotension were ultimately attributed to diarrhea, causing ongoing fluid losses in the context of the patient continuing to take losartan. The patient had not disclosed to her oncologist that she had developed diarrhea. It was felt that her diarrhea was most likely attributable to the bortezomib rather than a Crohn's disease flare, as subsequent

re-challenge with bortezomib again resulted in diarrhea.

The patient's angiotensin receptor blocker (ARB) was held, and her renal function recovered. However, the patient's ARB was not restarted by the medical team before discharge.

## Preventable Adverse Drug Events (pADEs).

A recent study, published in the BMJ, identified root causes of preventable adverse drug events (pADEs) contributing to hospital admission.<sup>1</sup> Key learning messages for the common types of pADEs found were developed to share with family physicians,

community pharmacists and patients and families<sup>1</sup>. These messages specify actions, which, if taken by providers and patients, could reduce the risk of associated pADEs. This study intended to reduce medical admissions or ED visits, and this case illustrates some of the key findings.

One of the recommendations is the use of "sick day plans" for patients and their families. As in this

patient's case, the inability of the patient to recognize side effects of treatment (diarrhea, dizziness) was present in 23% of patients. Therefore, ensuring that patients can recognize when

medications are causing side effects and what they should do (report to family MD or go to the Emergency Department) was a key finding. A learning message for patients/families addresses this: Measurement of BP at home and recognizing orthostatic hypotension.

## What is a sick day plan?

The concept of providing a medication sick day plan refers to avoiding medications belonging to the SADMANS group during periods of reduced fluid intake. The goal is to reduce the risk of or mitigate side effects from these agents; hypotension (ACEi/ARB/diuretics/SGLT2 inhibitors), acute kidney injury (ACEi/ARB/diuretics/mineralocorticoid inhibitors/NSAIDs), hypoglycemia (sulfonylureas), lactic acidosis

*continued on page 7*



Jane de Lemos



## Sick Day Medication Management (for physicians and pharmacists)

Patients frequently present to hospital with hypotension, acute kidney injury, hypoglycemia, or elevated INR (on warfarin) following a period of illness. Providing your patient with a sick day management plan may help prevent or mitigate these admissions.

The patient should be asked to call your office in 24 hours so you can provide further advice. If the office is closed an alternative contact could be their local Pharmacy or BC HealthLink 811.

### Decreased Fluid Intake

If patients become ill and are unable to maintain adequate fluid intake (e.g. due to gastrointestinal illness) they should be instructed to hold medications which:

- Will increase risk for a decline in kidney function (e.g. ACEi/ARB)
- Have reduced clearance and increase risk for adverse effects (metformin, sulfonylureas, SGLT-2 inhibitors).

If decreased FLUID intake, to avoid side effects and AKI, stop these SADMANS drugs:

- S** sulfonylureas (e.g. glimepiride)
- A** ACE-inhibitors (e.g. ramipril)
- D** diuretics, direct renin inhibitors (aliskiren)
- M** metformin, mineralocorticoid receptor blockers (e.g. spironolactone, eplerenone)
- A** angiotensin receptor blockers (e.g. candesartan)
- N** non-steroidal anti-inflammatory drugs
- S** SGLT2 inhibitors (e.g. canagliflozin)

But in addition, if patients are eating significantly less (regardless of fluid intake) they are at increased risk of hypoglycemia (sulfonylureas / insulin). Reduced intake can also affect warfarin (risk of a high INR) by a reduction in vitamin K intake. In addition diarrhea can also lead to a high INR due to sloughing of normal bowel flora (a source of vitamin K).

[https://www.vchri.ca/sites/default/files/Richmond/sick\\_day\\_medication\\_management\\_for\\_physicians\\_and\\_pharmacists.pdf](https://www.vchri.ca/sites/default/files/Richmond/sick_day_medication_management_for_physicians_and_pharmacists.pdf)

# BC Cancer Summit: Forging a path forward – Nov. 18 to 20, 2021

By Dr. Ursula Lee and  
Dr. Christine Simmons

BC Cancer is delighted to host the BC Cancer Summit virtually this year from November 18 to 20. The BC Cancer Summit provides education, professional development and relationship building opportunities for oncology professionals from all specialties and disciplines.

The theme of this year's Summit is "Forging a path forward". Focusing on the latest techniques and research, the Summit will cover developments in science, translational research, clinical trials, prevention, treatment, safety, clinical and palliative care, ethics, and survivorship.

The Summit will feature keynote presentations starting with the Right Honourable Beverley McLachlin. She is a former justice of the Supreme Court of Canada and served as chief justice from 2000 to 2017. As our longest-serving chief justice and the first woman in the role, she

has made a significant impact on Canada's legal landscape. Throughout her career, she has striven to ensure the primacy of the rule of law, and has promoted impartiality, equality and access to justice for all.



In addition to the Right Honourable Beverley McLachlin, we will also hear from keynote presentations from PREcision oncology Evidence Development in Cancer Treatment (PREDiCT) and Precision Oncology for Young People (PROFYLE).

The Summit will allow participants to engage in a series of virtual breakout sessions. These breakouts will include sessions from various tumour groups such as the Breast Tumour Group, Head and

Neck Tumour Group, Lung Tumour Group, Lymphoma Tumour Group, GI Tumour Group and more, and sessions from professional practice and supportive care.

There will also be a poster session with abstracts presented in the following themes: Population Health & Health Services; Translation/Clinical Research; Biology and Informatics; and Patient Experience and Supportive Care. In addition, the Terry Fox Research Institute (TFRI) BC Node Research Day will be held conjointly and will provide insight on the innovative Terry Fox research taking place in our province.

This event is also an opportunity to recognize staff and physicians across the organization with an awards ceremony for the 2021 Doctors of BC Terry Fox Medal and BC Cancer Excellence Awards.

We hope to see you at this year's Summit! Visit [bccancersummit.ca](http://bccancersummit.ca) to register. Please be sure to register by 5 p.m., November 15.

*Preventable adverse drug events continued from page 6*

(metformin), euglycemic DKA (SGLT2 inhibitors). This has been endorsed by the Canadian Diabetes Association since 2013 but is not in widespread practice.<sup>2</sup>

The study found that the absence of sick day management was involved in 12.5% of patients with pADEs. In addition, the absence of a sick day plan was deemed the cause for 50% of patients presenting with hypotension due to a pADE. Together with content experts (Dr. D Harris, Endocrinologist, and Dr. Agnes Lee, Hematologist), the study team developed a slightly modified version

of the original SADMANS. This modified version moved sulfonylureas to a specific section of medications to skip if the patient has reduced caloric intake and added a new section on warfarin management during periods of reduced eating or severe diarrhea.

## How to provide sick day advice and other resources

A companion leaflet supports healthcare providers to complete a sick day medication plan for patients. It provides a suggested method to ensure the patient/family can follow the steps required<sup>3</sup>. The use of the TeachBack style is advocated, as providers not ensuring

that patients understand the information provided was a root cause involved in 29% of patients with pADEs. Patient versions are available in Traditional Chinese or Punjabi.<sup>4</sup>

Patients undergoing chemotherapy are at risk of reduced fluid/caloric intake and diarrhea. The provision of sick day plans could help prevent side effects from SADMANS medications and warfarin during these periods, and thereby reduce the severity or prevent the development of associated complications (e.g. hypotension, AKI, hypoglycemia, bleeding/elevated INR).

## SADMANS medications

- S= sulfonylureas (e.g. gliclazide)
- A= ACE-inhibitors (e.g. perindopril)
- D= diuretics, direct renin inhibitors (e.g. aliskiren)
- M= metformin, mineralocorticoid receptor blockers (e.g. spironolactone, eplerenone)
- A= ARB (e.g. losartan)
- N= NSAIDs (e.g. ibuprofen)
- S = SGLT2 inhibitors (e.g. empagliflozin)

*see References on page 18*

## Learnings from this case study

The patient in this case study could have benefited from a sick day plan, together with a plan to measure BP at home and confirmation that they could recognize her "red flag symptoms"; side effects of medications which warrant medical attention; losartan (dizziness) and bortezomib (diarrhea). The expected potential benefits of such a plan would be that the resulting hypotension and AKI would not have been as severe or could possibly have been prevented. Although the patient's ARB was not restarted before discharge, future use would not be contra-indicated provided the patient could follow a sick day plan.

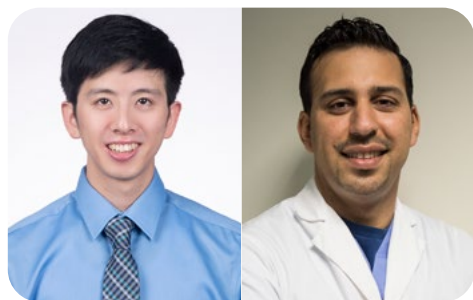
# Interventional oncology: common procedures and their applications

By Jasper Yoo, Medical Student,  
University of British Columbia

Dr. Pedro Lourenço, Interventional  
Radiologist, Surrey Memorial Hospital

Dr. Behrang Homayoon, Interventional  
Radiologist, Surrey Memorial Hospital

Interventional oncology (IO) is a fast-growing branch of interventional radiology that utilizes minimally invasive techniques



Jasper Yoo

Dr. Behrang Homayoon

and image guidance to diagnose, treat, and palliate cancer and to treat cancer-related conditions. It plays an increasingly significant role in the multidisciplinary and personalized approach to treating oncologic patients, and is the fourth pillar of modern cancer care.<sup>1,2</sup>

Most IO procedures are done on an outpatient basis and are performed under local anesthesia, moderate sedation, or regional anesthetic blocks. Some procedures, such as complex ablation procedures, require general anesthesia and overnight inpatient monitoring and management. In this article, we will provide a brief overview of commonly performed interventional oncology procedures.

## Percutaneous ablation

Percutaneous ablation involves the direct application of chemicals, thermal energy, or nonthermal energy to eradicate or substantially destroy tumours.<sup>3</sup> It is most commonly used to treat tumours of the liver, kidney, lung, and musculoskeletal system.<sup>4</sup> Ablation treatment objectives include curative intent, cytoreduction of oligometastatic disease, and/or palliation of pain. Recent studies suggest that ablation may have immunomodulatory effects, and may work synergistically with immunotherapy.<sup>5</sup>

Commonly used ablation modalities include radiofrequency (RFA), microwave (MWA), and cryoablation. RFA was used most commonly in the past, but has been largely superseded by MWA and cryoablation, which provide technical advantages over RFA that are likely to result in improved outcomes.<sup>4</sup>

Cementoplasty is an adjunctive technique that can be used with ablation to stabilize pathologic fractures related to osseous tumours. The combination of thermal ablation and cementoplasty can be very effective in relieving pain from osseous malignancies,<sup>6</sup> and durable pain relief can be expected in 1-2 days.<sup>7</sup>

## Embolization

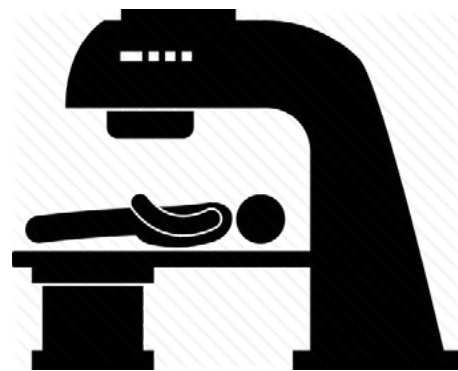
Embolization involves direct injection of various agents, including occlusive agents, chemotherapeutics, and radioactive particles, into the bloodstream or the lymphatic system through various catheters. The aim of embolization with occlusive agents is cessation of blood flow to the target of interest, and it is most commonly used to treat arterial hemorrhage. In the lymphatic system, lymphangiography and thoracic duct embolization are used to treat chylous leaks unresponsive to conservative management.<sup>8</sup>

Bland embolization with occlusive agents, transarterial chemoembolization (TACE), and transarterial radioembolization (TARE) are important treatment strategies in patients with liver-dominant hepatocellular carcinoma, cholangiocarcinoma, or hepatic metastases.<sup>9-10</sup> TACE involves injection of a combination of an embolic agent and a chemotherapy drug, and TARE involves injection of yttrium-90 microspheres into hepatic arteries.<sup>11</sup>

## Venous procedures

Subcutaneous drug infusion ports are placed for patients requiring long-term, intermittent venous access.<sup>12</sup> Retrievable inferior vena cava filter placement is an option for well-selected patients with contraindication to anticoagulation, and should ideally be removed if the patient can be safely placed back on anticoagulation.<sup>13</sup>

Central venous stenting, most often used in



the setting of superior vena cava syndrome (SVCS), is very effective in rapidly alleviating symptoms related to central venous obstruction, with approximately 95% of patients with malignant SVCS experiencing symptom improvement within 72 hours.<sup>14</sup>

## Procedures to palliate cancer-related symptoms or feeding difficulties

Symptoms of malignant pleural effusions and ascites can be alleviated with placement of tunnelled pleural drainage and peritoneal catheters.<sup>15</sup> Percutaneous chemical or thermal neurolysis can be used to treat cancer-related pain and reduce the need for opioids.<sup>16</sup>

Percutaneous gastrostomy tube placement is indicated for long-term feeding in patients who have lost the ability for oral intake, but it can also be used for venting gastric contents in small bowel obstruction. Although gastrostomy tube placement is favoured, gastrojejunostomy tube placement can be considered in patients who are at risk of aspiration related to gastroesophageal reflux or those who cannot tolerate gastric feeding.<sup>8</sup>

## Conclusion

Interventional oncologists employ minimally invasive image-guided techniques to diagnose and treat cancer and its related symptoms. They play a key role in the multidisciplinary management of cancer patients. Access to these procedures can be obtained through direct referral to an interventional radiology department or through various multidisciplinary tumour boards.

see References on page 18



# Cancer care in space and time – what is possible in Golden, BC

By Dr. Sian Shuel, Medical Education Lead FPN with Dr. Trina Larsen-Soles

If you've ever driven out east, chances are, you've been through Golden. Dr. Trina Larsen-Soles, however, has called Golden her home since 1987. When she moved to her husband's hometown, there were six physicians in a town with a population of 3,000. In Golden, serving patients from Rogers Pass in the west to Lake Louise in the east and as far south as Invermere, physicians' practices were full service. Services included helping with supervision of intravenous chemotherapy, which was shipped on the bus from Salmon Arm and Kamloops and administered in the emergency room by the local physicians. (insert map image) However, in the 1990s, as regulations around the administration of biohazardous medications changed, including the need for an on-site pharmacy with a fume hood, the provision of intravenous chemotherapy in Golden was no longer possible.

On speaking with Dr. Larsen-Soles, it's evident that she works from the lens of what is possible and can be done safely. While seeing patients in her community modify their treatment decisions based on requirements to travel, and after going through a cancer diagnosis and journey with her mother, Dr. Larsen-Soles decided she wanted to become a local resource for patients in her community. Her goals of helping streamline access to diagnostics and symptom management was the driving force behind pursuing the 8-week GPO Education. "Despite there being no community chemotherapy clinic in Golden, there's an awful lot of cancer care I can do here and my focus through GPO Education was on what can be done every day in rural communities in BC. I tailored the clinical portion of GPO Ed around things I can do in Golden. For example, I spent quite a bit of time with the Pain and Symptom Management Clinic in Vancouver (Golden's regional care centre in Kelowna was undergoing renovation at that time) and now I can be that symptom management resource to my community. I also learned

how better to access appropriate imaging for specific types of cancer and where those resources are located. The networking aspect of GPO Education has also been so

helpful to providing care. I now know the people, and I can pick up the phone and know who to talk to."

As previously noted, Dr. Larsen-Soles shares, "One of my dream goals is to look at what is possible and can be done safely. For example, working closely with the nearest Community Oncology Network site in

Cranbrook and with the Regional Centre in Kelowna, I was able to help follow a patient with a large rectal cancer who was on oral chemotherapy. He had no car, and sitting on the bus for 3 hours to Cranbrook was too painful. I believe it made a significant difference to his quality of life over his last year."

With a personal plan of retiring from family practice in June 2022, Dr. Larsen-Soles is looking at the possibility of building supportive cancer care and follow-up care into a program in her area. The combination of an ageing population and improvement in survival rates is resulting in the number of patients with cancer requiring care



Dr. Trina Larsen-Soles



increasing. "As follow-up care moves more and more into the community, I see an opportunity to help my GPO and primary care colleagues through follow-up clinics in the East Kootenay's."

Over time, a broader range of medical services have made their way into the area. Golden retains its operating room, with coverage provided by a general surgeon and family physicians with enhanced skills in surgery and obstetrics. The town has regular visiting orthopedics coverage and outreach clinics with internal medicine, ENT, gynaecology and pediatrics.

When asked about what she enjoys about working in cancer care, Dr. Larsen-Soles says, "It's nice to learn something different. I've been a full-service rural physician for a long time and it's been fun focussing on one thing and getting better at it...I find cancer diagnostics particularly interesting and get a

*continued on page 16*

## Next GPO Education course begins February 7, 2022

The next GPO Education Introductory Module begins February 7, 2022. **The GPO Education Program is intended for newly hired GPOs in BC/Yukon with a confirmed position at a BC Cancer or Health Authority Community Cancer Clinic.** The aim is to facilitate the acquisition of the foundational oncology knowledge and clinical experience required to deliver systemic therapy and cover associated aspects of supportive care within their local community. It includes a fully accredited two-week equivalent didactic Introductory Module held twice yearly, followed by 30 days of flexibly scheduled clinical rotation. Due to the respiratory illness season and weather/travel restrictions during February and early March, going forward each spring GPO Introductory Education Module will be provided virtually and split into two 2-week half-day sessions. For the spring 2022 intake, morning sessions will be held February 7 – 18 and afternoon sessions February 28 - March 11.

To stay up to date and to meet CME credit requirements, GPOs currently in practice can also sign up for topics of interest within these accredited "refresher" virtual sessions.

Links for employment opportunities as a GPO can be found at: [www.fpon.ca](http://www.fpon.ca)

# A summer to remember

By Dr. Cathy Clelland, Medical Director,  
Primary Care, BC Cancer

As the summer of 2021 sets into fall, I will remember it as one filled with an ebb and flow of emotions. Some good, many not so good. Out of it all is a chance to reflect on where we have been and where we are going. On the positive side, we have seen COVID vaccinations getting ever so much closer to “herd immunity,” with more than 80% of eligible people having had their first immunization, and with over three-quarters being fully vaccinated. With the Olympics and Paralympics in Tokyo, we have had an opportunity to cheer on our athletes. Remarkable performances had Canada’s athletes see some of their best results ever during the summer games.

On the other side of that coin, we have seen a record number of forest fires with the devastation of several communities in British Columbia and around the world. Canadians have also had to face the realities of racism and inequities, both historical and current. The findings of many unmarked graves on several former Residential School sites, documentation of systemic racism within our healthcare system and incidents of multi-cultural racism through the pandemic have brought to the forefront the impact of racism

and inequities that exist in our province and country. Acknowledging these experiences is the first step towards true reconciliation

both as a nation as well as at a systemic and personal level. Our thoughts and support are with those impacted by the fires and the ongoing impacts of the Residential School system and systemic racism within the healthcare system. We can and must do better.

In particular, there have been reports over recent years indicating significant disparities in cancer care and health outcomes in First Nations,

Inuit and Métis populations as well as other racial minorities and socio-economically disadvantaged groups and under-served communities.<sup>1,2</sup> In 2017, the BC Indigenous Cancer Strategy was released as a result of collaboration between BC Cancer, First Nations Health Authority (FNHA), Métis Nation BC and the BC Association of Aboriginal Friendship Centres. This can be found at <https://www.fnha.ca/WellnessSite/WellnessDocuments/improving-indigenous-cancer-journeys-in-bc.pdf>. As part of the implementation of the Strategy, BC Cancer has hired 3 Indigenous patient navigator roles to support patients and families at Vancouver, Kelowna and Prince George cancer centres, respectively, with more roles being planned. BC Cancer has also developed a page on its website to provide

resources and links for information and updates into

the ongoing work to improve the cancer journey for BC’s indigenous peoples. <http://www.bccancer.bc.ca/our-services/services/indigenous-cancer-control>

As the Divisions of Family Practice across BC work with their local Health Authority Primary Care partners to develop and implement Primary Care Networks supporting Patient Medical Homes, there will be opportunities for Divisions to collaborate with the Regional Cancer Centres and local Community Oncology Network (CON) sites to address gaps and inequities in the cancer care journey, both at the local and provincial level. Issues for consideration in these conversations could include addressing access to cancer screening, early diagnosis and referral for treatment, management of comorbidities and appropriate access to shared care along the cancer journey. All cancer screening programs in BC require people to have a primary care provider. The high number of unattached patients can be a significant barrier to an important step in improving cancer outcomes. There are a variety of underlying causes for the disparity in cancer care experienced by many in the BIPOC (Black, Indigenous and People of Colour) community. This includes access to care, as well as real or perceived fear of discrimination when receiving care. Addressing fear of “the system” needs to be a part of these conversations.

It has truly been a summer to remember. We need to keep these memories front and centre as we work toward improving the cancer care experience for all British Columbians.

see References on page 19



Dr. Cathy Clelland

Cover artwork by Chris Bear



## Living with cancer: everyone deserves support

In 2015 – 2016, the First Nations Health Authority, Métis Nation BC, BC Association of Aboriginal Friendship Centres and BC Cancer partnered with First Nations and Métis cancer patients, survivors and their families to create a new resource that aims to support individuals and families on their cancer journey. This resulted in “Living with Cancer: Everyone Deserves Support” that was published in 2017.

[www.fnha.ca/about/news-and-events/news/living-with-cancer-resource-published-to-support-first-nations-m-tis-and-aboriginal-peoples-on-cancer-journey-in-bc](http://www.fnha.ca/about/news-and-events/news/living-with-cancer-resource-published-to-support-first-nations-m-tis-and-aboriginal-peoples-on-cancer-journey-in-bc)

# Exercise and cancer care: when, why, what and how often?

By Dr. Hannah Nette, MD, CCFP, FCFP  
Director of Clinical Services, InspireHealth  
Supportive Cancer Care

Dr. Donald C. McKenzie MSM, MD, PhD, LLD  
(Hons) Professor Emeritus, Division of Sport  
& Exercise Medicine, UBC

Research in the area of exercise oncology has been growing at a steady rate over recent decades. Strong evidence now exists for the relationship between regular exercise and a number of cancer-related health outcomes including a decreased risk of cancer-specific mortality and recurrence rate, less fatigue, improved mental health and quality of life, and improved perceived physical function.<sup>1</sup> Meta-analysis data from 23 studies among breast, colorectal and prostate cancer patients indicates that post-diagnosis physical activity is associated with a 26-69% decreased risk of cancer-specific

mortality when comparing those in highest activity categories with those in lowest activity categories.<sup>2</sup> In addition, a 21-45% decreased risk of all-cause mortality has been associated with breast, colorectal and



Dr. Hannah Nette Dr. Don McKenzie

prostate patients in a higher activity group compared to those in the lower activity group.<sup>2,10</sup>

Additional research has shown that resistance exercise is safe and not associated with the development of lymphedema,<sup>3</sup> that increasing aerobic fitness during chemotherapy may help to improve chemotherapy completion rate (CCR),<sup>4</sup> and that improvements in bone health and sarcopenia can accompany a supervised exercise program.<sup>5</sup> In addition, exercise may reduce “chemo-brain” in women following treatment for breast cancer<sup>6</sup> and recent work has examined the potential of exercise to be “cardioprotective” in breast cancer patients receiving anthracycline chemotherapy.<sup>7</sup>

Given this data, physical activity represents a critical factor in the management of cancer patients and should be standard of care. However, despite these published benefits, including position statements recommending

*continued on page 16*

## Effects of Exercise on Health-Related Outcomes in Those with Cancer

### What can exercise do?

- **Prevention of 7 common cancers\***  
Dose: 2018 Physical Activity Guidelines for Americans: 150-300 min/week moderate or 75-150 min/week vigorous aerobic exercise
  - **Survival of 3 common cancers\*\***  
Dose: Exact dose of physical activity needed to reduce cancer-specific or all-cause mortality is not yet known; Overall more activity appears to lead to better risk reduction
- \*bladder, breast, colon, endometrial, esophageal, kidney and stomach cancers  
\*\*breast, colon and prostate cancers

Overall, avoid inactivity, and to improve general health, aim to achieve the current physical activity guidelines for health (150 min/week aerobic exercise and 2x/week strength training).

Outcome	Aerobic Only	Resistance Only	Combination (Aerobic + Resistance)
<b>Strong Evidence</b>	Dose	Dose	Dose
<b>Cancer-related fatigue</b>	3x/week for 30 min per session of moderate intensity	2x/week of 2 sets of 12-15 reps for major muscle groups at moderate intensity	3x/week for 30 min per session of moderate aerobic exercise, plus 2x/week of resistance training 2 sets of 12-15 reps for major muscle groups at moderate intensity
<b>Health-related quality of life</b>	2-3x/week for 30-60 min per session of moderate to vigorous	2x/week of 2 sets of 8-15 reps for major muscle groups at a moderate to vigorous intensity	2-3x/week for 20-30 min per session of moderate aerobic exercise plus 2x/week of resistance training 2 sets of 8-15 reps for major muscle groups at moderate to vigorous intensity
<b>Physical Function</b>	3x/week for 30-60 min per session of moderate to vigorous	2-3x/week of 2 sets of 8-12 reps for major muscle groups at moderate to vigorous intensity	3x/week for 20-40 min per session of moderate to vigorous aerobic exercise, plus 2-3x/week of resistance training 2 sets of 8-12 reps for major muscle group at moderate to vigorous intensity
<b>Anxiety</b>	3x/week for 30-60 min per session of moderate to vigorous	Insufficient evidence	2-3x/week for 20-40 min of moderate to vigorous aerobic exercise plus 2x/week of resistance training of 2 sets, 8-12 reps for major muscle groups at moderate to vigorous intensity
<b>Depression</b>	3x/week for 30-60 min per session of moderate to vigorous	Insufficient evidence	2-3x/week for 20-40 min of moderate to vigorous aerobic exercise plus 2x/week of resistance training of 2 sets, 8-12 reps for major muscle groups at moderate to vigorous intensity
<b>Lymphedema</b>	Insufficient evidence	2-3x/week of progressive, supervised, program for major muscle groups does not exacerbate lymphedema	Insufficient evidence
<b>Moderate Evidence</b>			
<b>Bone health</b>	Insufficient evidence	2-3x/week of moderate to vigorous resistance training plus high impact training (sufficient to generate ground reaction force of 3-4 times body weight) for at least 12 months	Insufficient evidence
<b>Sleep</b>	3-4x/week for 30-40 min per session of moderate intensity	Insufficient evidence	Insufficient evidence

Citation: [bit.ly/cancer\\_exercise\\_guidelines](https://bit.ly/cancer_exercise_guidelines)

Moderate intensity (40%-59% heart rate reserve or VO<sub>2R</sub>) to vigorous intensity (60%-89% heart rate reserve or VO<sub>2R</sub>) is recommended.





# Radiotherapy side effects: clinical gems for practice

By Dr. Genevieve Chaput  
Division of Supportive and Palliative  
Medicine, Secondary Care and Oncology  
Departments, McGill University Health  
Centre, Montreal, QC  
Assistant Professor, McGill University  
genevieve.chaput@mcgill.ca

Family physicians play an integral role in the cancer care trajectory. Radiotherapy is used in approximately 50% of patients afflicted with malignancies such as skin, breast, lung, head and neck, prostate, gastrointestinal, gynecological, urological, hematological and brain cancers.<sup>1</sup> Despite improvements in delivery modalities,<sup>2</sup> radiotherapy side effects can be burdensome to patients,<sup>3</sup> and therefore warrant optimal management.

Radiotherapy side effects can be psychological and/or physical. Physical side effects occur locally or loco-regionally, in radiated tissues and organs. While early side effects occur during or within weeks of radiotherapy completion, late effects typically occur months to years following treatment exposure.<sup>3</sup> A summary of common



Dr. Genevieve Chaput

side effects and clinical gems are presented below. Useful assessment and management tools are outlined in Table 1.<sup>4-12</sup>

## Psychological

Despite occurrence of distress, anxiety, and depression to some degree in all patients, psychological side effects are likely underestimated due to suboptimal standardization of distress screening in Canada.<sup>13</sup> Seriated distress screening (ESAS-r, DT, and/or PHQ-2), timely non-pharmacological and/or pharmacological interventions, and regular follow-ups are key to optimal care of patients with psychosocial issues.<sup>13</sup>

### Clinical gem

Radiotherapy-induced hypothyroidism and B12 malabsorption should be eliminated as possible contributing factors.<sup>14</sup>

## Fatigue

Nearly 80% of patients who receive radiotherapy and/or chemotherapy experience fatigue, which interferes with routine functioning and adversely impacts quality of life.<sup>15</sup> Cornerstone of management includes patient education and support.<sup>15</sup> Physical exercise, acupuncture, yoga, and cognitive or mindfulness-based therapies might alleviate fatigue.<sup>15</sup> In persisting cases, methylphenidate might be helpful while modafinil is not advised.<sup>15</sup>

### Clinical gem

Prompt identification and treatment of potentially contributing factors such as anemia, endocrine or cardiac abnormalities are key to management.<sup>15</sup>

## Skin

Radiation dermatitis is a common skin reaction that occurs in head and neck, breast, vulvar and anorectal areas. General skin care and symptom management interventions are typically based on dermatitis grade severity, which ranges from mild to life-threatening.<sup>5</sup>

### Clinical gem

Tobacco use, as well as chronic illnesses such as anemia and diabetes can contribute to radiation dermatitis severity and must therefore be optimally addressed.<sup>5</sup>

## Head and Neck

Radiation can affect surrounding structures and lead to xerostomia, oral mucositis, taste alterations, dysphagia, and hypothyroidism. Carotid artery stenosis can also occur, thereby increasing risk of cerebrovascular disease.<sup>16</sup>

### Clinical gem

Features suggestive of hypothyroidism should not be overlooked; screening with TSH every 6-12 months after radiotherapy is recommended, as thyroid hormone can be readily replaced;<sup>17</sup>


Routine screening and management of carotid artery risk factors (diabetes, smoking, hypertension, dyslipidemia, and arterial diseases) are crucial in follow-up care.<sup>16</sup>

## Cardiac

Radiation-induced heart disease can develop years after radiation, and presents as cardiomyopathy, pericardial disease, valvular and coronary artery diseases, and conduction abnormalities.<sup>18</sup> Annual screening is recommended; baseline echocardiogram 6-12 months after radiation can be considered.<sup>19</sup>

## Educational opportunities provided by BC Cancer's Family Practice Oncology Network

made possible in part thanks to the support of the BC Cancer Foundation

  @bccancerfdn  
 /BCCancerFoundation  
bccancerfoundation.com

**BC  
CANCER** FOUNDATION

continued on page 13

### Clinical gem

Mainstay of management is focused on healthy lifestyle promotion and modifiable risk factors (smoking, hypertension, diabetes, dyslipidemia, obesity).<sup>19</sup>

### Pulmonary

Radiation-induced lung injury (RILI) can result from thoracic radiotherapy and negatively impact quality of life.<sup>20</sup> RILI is divided into an acute inflammatory phase known as radiation pneumonitis (within 12 weeks of radiotherapy), and a chronic phase referred as radiation fibrosis.<sup>21</sup> Steroids can aid in the treatment of symptomatic patients.<sup>21</sup>

### Clinical gem

Given clinical features (dyspnea, dry cough, possible fever) are similar to other pulmonary pathologies and physical findings are often non-contributory,<sup>21</sup> RILI must always be included in the differential diagnosis.

### Gastrointestinal

Radiation to treat pelvic cancers can result in pelvic radiation disease (PRD); clinical presentation can exhibit varying gastrointestinal symptoms such as diarrhea, rectal bleeding, and urgency.<sup>22</sup> PRD symptoms can be mild to severe, and clinical course can be self-limiting or persisting in the longer-term.<sup>22</sup> Given that as many as 22 non-PRD specific gastrointestinal symptoms can occur, thorough investigation is advised.<sup>23</sup>

### Clinical gem

Irrespective of severity, PRD can significantly alter quality of life; optimal investigations and management are therefore imperative. Evidence for dietary modifications, aminosalicylates, sucralfate, corticosteroid enemas, bile acid sequestrants, selenium, and famotidine in PRD management is currently sparse.<sup>24</sup>

### Genito-urinary

Dyspareunia, vaginal dryness and stenosis, decreased libido and erectile dysfunction can occur following pelvic radiation.<sup>25</sup> Pelvic physiotherapy and vaginal dilator use can aid vaginal elasticity.<sup>25</sup> Non-hormonal lubricants are recommended for dryness experienced during intercourse.<sup>25</sup> Phosphodiesterase type 5 inhibitors can be used for erectile dysfunction management.<sup>26</sup> Urinary symptoms can also occur such as dysuria, urinary frequency, obstructive symptoms, micro or macroscopic hematuria, and incontinence.

Family physicians are invaluable quarterback providers of cancer survivors. In addition to managing psychological and physical radiotherapy side effects, their primary and secondary prevention roles are essential in healthy lifestyle promotion, and management of risk factors and comorbid conditions of patients with a cancer history.

### Clinical gem

Self-esteem, intimacy, and sexual health issues often arise due to these side effects.<sup>25</sup> Screening for intimacy and sexual concerns, and referral to allied health (psychologist, sexual health therapist) when indicated are part of optimal survivorship care.<sup>26</sup>

see References on page 20

## Table 1. Radiation side effects: useful clinical tools

### Fatigue

- Fatigue symptom management guidelines<sup>4</sup>  
[www.bccancer.bc.ca/nursing-site/Documents/6.%20Fatigue%20and%20Anemia.pdf](http://www.bccancer.bc.ca/nursing-site/Documents/6.%20Fatigue%20and%20Anemia.pdf)

### Skin

- Dermatitis symptom management guidelines<sup>5</sup>  
[www.bccancer.bc.ca/nursing-site/Documents/Symptom%20Management%20Guidelines/14RadiationDermatitis.pdf](http://www.bccancer.bc.ca/nursing-site/Documents/Symptom%20Management%20Guidelines/14RadiationDermatitis.pdf)

### Head and Neck

- Oral mucositis clinical practice guidelines<sup>6</sup>  
[www.ncbi.nlm.nih.gov/pmc/articles/PMC7540329/table/cncr33100-tbl-0001/?report=objectonly](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC7540329/table/cncr33100-tbl-0001/?report=objectonly)
- Xerostomia<sup>7</sup>  
[www.ncbi.nlm.nih.gov/pmc/articles/PMC6318483/pdf/WJCO-10-1.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6318483/pdf/WJCO-10-1.pdf)
- Head and Neck: Care of Radiation Therapy Side Effects<sup>8</sup>  
[www.bccancer.bc.ca/patient-and-public-info-site/Documents/RT%20Side%20Effects%20Education%20Materials/Care-of-Radiation-Therapy-Side-Effects-Head-and-Neck.pdf](http://www.bccancer.bc.ca/patient-and-public-info-site/Documents/RT%20Side%20Effects%20Education%20Materials/Care-of-Radiation-Therapy-Side-Effects-Head-and-Neck.pdf)

### Pulmonary

- Radiation-Induced Lung Injury (RILI): Assessment and Management<sup>9</sup>  
[www.ncbi.nlm.nih.gov/pmc/articles/PMC8097634/pdf/main.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC8097634/pdf/main.pdf)

### Gastrointestinal

- Pelvic Radiation Disease: Common Gastrointestinal Symptoms and Management<sup>10</sup>  
[www.ncbi.nlm.nih.gov/pmc/articles/PMC7253739/table/tlll-conc-27-107/?report=objectonly](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC7253739/table/tlll-conc-27-107/?report=objectonly)

### Genito-urinary

- Urinary Incontinence<sup>11</sup>  
[www.cancer.net/coping-with-cancer/physical-emotional-and-social-effects-cancer/managing-physical-side-effects/urinary-incontinence](http://www.cancer.net/coping-with-cancer/physical-emotional-and-social-effects-cancer/managing-physical-side-effects/urinary-incontinence)

### Other

- Lymphedema<sup>12</sup>  
[www.ncbi.nlm.nih.gov/pmc/articles/PMC7755442/pdf/conc-27-336.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC7755442/pdf/conc-27-336.pdf)

# COVID-19, cancer screening and personal health risk assessment

By Dr. Cathy Clelland,  
GPSC Practice Management Consultant  
Medical Director, Primary Care, BC Cancer

The coronavirus pandemic initially led to sharp decreases in the use of recommended cancer screening tests, which could mean that some early cancers may have gone undetected. In BC, cancer screening services for breast, colorectal and cervical cancer have now all resumed however the levels still have not bounced back from the slowdown. The pandemic “backlog” has resulted initially in reminder notices being sent out in a staged manner for all three screening programs.

- Screening mammography services have resumed with COVID protocols in place at all screening centres, including three mobile screening units. Notices direct to patients
- Pap test recall notices resumed late 2020 and are now direct to patients. The new

facilitated referral to colposcopy process went live in December 2020.

- FIT testing reminder notices for screening have also resumed.

The pandemic saw a significant increase in virtual primary care, and as practices move to a new normal with a balance of in-person and virtual visits, this could include the use of video conferencing tools to educate people about cancer screening tests along with other preventive activities

that take into account a patient’s unique risk factors, age and lifestyle choices. A “Periodic Health Review” as defined by the College of Family Physicians of Canada and Choosing Wisely Canada recommends primary care providers undertake open conversations with their patients around life style factors, encouraging them to make positive changes to reduce risks of chronic disease and cancer, and is supported in BC through the Personal Health Risk Assessment Incentive.

*continued on page 15*

For more information on the Personal Health Risk Assessment incentive please check the GP Services Committee website at: <https://gpscbc.ca/what-we-do/incentives/fees> or the BC Family Doctors website at: <https://bcfamilydocs.ca/covid19/>

For more information on Periodic Health Reviews please check the CFPC website at: <https://www.cfpc.ca/CFPC/media/Resources/Patient-Education/RFH-Rethinking-Annual-Physical-1to4.pdf>

For more information on Cancer Screening in BC, please check out the patient and provider information at: <http://www.bccancer.bc.ca/screening>

## Screening saves lives

Screening can prevent cancer or help catch it in its earliest stages, allowing more treatment options and a better chance of recovery. BC Cancer has province-wide screening programs for breast, cervical, and colon cancer.

## Popular Links

- [Cancer Screening & COVID-19](#) >
- [Find a Mammography Clinic](#) >
- [Abnormal FIT Results](#) >
- [Find a Pap Test Clinic](#) >
- [Lung Screening Program Announcement](#) >



### Breast Screening

Screening mammograms help find cancer when it is small, allowing more treatment options and a better chance of recovery. Free screening mammograms are available for eligible BC women ages 40 and older.



### Cervix Screening

Regular screening can reduce the risk of developing cervical cancer by 70% and save your life. If you have a cervix and are between the ages of 25-69, you should be screened every three years for cervical cancer.



### Colon Screening

Colon cancer is one of the most commonly diagnosed forms of cancer, affecting one in six people in British Columbia. If you are between the ages of 50-74, you should get screened regularly for colon cancer.



COVID-19 and cancer screening  
continued from page14

The Personal Health Risk Assessment (Prevention) incentive code 14066 is payable to the family physician who is most responsible for the longitudinal primary medical care for patients in one of the designated target populations (see GPSC or BC Family Doctors websites for details). This incentive is compensation for the review with an eligible patient, of the relevant age and gender specific targeted clinical preventative actions of proven benefit, consistent with the Lifetime Prevention Schedule and GPAC Obesity and Cardiovascular Disease – Primary Prevention Guidelines. This includes cancer prevention and screening activities. During the COVID-19 pandemic, since June 1, 2020, the required face-to-face visit to provide a personal health risk assessment can be provided via telehealth. When billing 14066 for an assessment visit that is done virtually, you must include an e-note stating "Personal Health Risk Assessment visit provided by telehealth" to facilitate the payment process.

## FPON Continuing Medical Education: Webcasts

The Network strives to provide directly relevant, accessible oncology continuing medical education opportunities for primary care providers in BC and the Yukon. Webcasts are presented in partnership with UBC's Division of Continuing Professional Development, and are held 8-9:00 a.m. (Pacific Time) the third Thursday of every month (except July, August and December). Our complimentary Webcasts provide opportunity to participate in topical, interactive oncology presentations from anywhere with Internet access, delivered via Zoom.

### Upcoming Webcasts

- October 21 CME Webcast - Immunization in Childhood Cancer.
- Upcoming topics include (TBA for dates): Follow-up Care of Patients with Indolent Lymphoma; Case Studies in Cancer Related Thrombosis; Return to Work for Cancer Survivors; and Lung Cancer Guidelines and New High Risk Screening Program.

Registration available at: [https://ubccpd.ca/learn/learning-activities#2-tag=\[Webinar%2520%2526%2520Rounds\]](https://ubccpd.ca/learn/learning-activities#2-tag=[Webinar%2520%2526%2520Rounds])

## BC Cancer Primary Care Learning Sessions

This series of online modules is for primary care professionals practicing in British Columbia who are interested in learning more about **colorectal**, **breast**, and **prostate** cancer care.

Each interactive module explores the role of primary care providers in supporting patients through their journey, as well as best practices in screening, treatment, and surveillance.

Includes resources and real-life case studies. No charge.

[ubccpd.ca/oncology/primary-care](https://ubccpd.ca/oncology/primary-care)



UBC CPD



CONTINUING PROFESSIONAL DEVELOPMENT  
FACULTY OF MEDICINE



*Exercise and cancer care  
continued from page 11*

that exercise should be included as a component of a patient's standard cancer treatment,<sup>8</sup> physical activity rates among cancer patients remain low with reports that less than half of cancer patients meet the suggested physical activity guidelines across multiple countries worldwide.<sup>9</sup>

Physicians and other primary care providers can play an important role by encouraging cancer patients to avoid inactivity and by adjusting the Physical Activity Guidelines for cancer patients to meet the patients' needs.<sup>11,12</sup> These guidelines include accumulating 150 minutes of moderate intensity aerobic activity per week (moderate intensity is 4-6 out of 10 on an effort scale) and 2 days per week of resistance training.

If side effects such as fatigue are present, recommendations are to start more slowly and build up as the patient's strength and stamina increase. Research has repeatedly shown that a written prescription from a physician leads to more compliance with the exercise prescription and improvement in health benefits for patients.<sup>11,12</sup>

Referral to qualified exercise professionals such as clinical exercise physiologists, physiotherapists or kinesiologists with cancer-specific training can also support patients to access the benefits of exercise both during and after cancer treatment. Involving the care of an exercise professional is strongly recommended for patients with more extensive cancer (e.g., presence of bone metastases), significant treatment side effects (e.g., peripheral neuropathy,

For more information on exercise support available for cancer patients please visit:

Physical Activity | HealthLink BC:  
[www.healthlinkbc.ca/physical-activity](http://www.healthlinkbc.ca/physical-activity)

BC Cancer Exercise Support: <http://www.bccancer.bc.ca/health-info/coping-with-cancer/exercise-support>

extreme fatigue) or other comorbidities (e.g., osteoporosis, cardiopulmonary disease).<sup>1</sup> These professionals can offer cancer patients individualized exercise prescriptions and provide resources and motivation for patients to exercise safely and regularly.

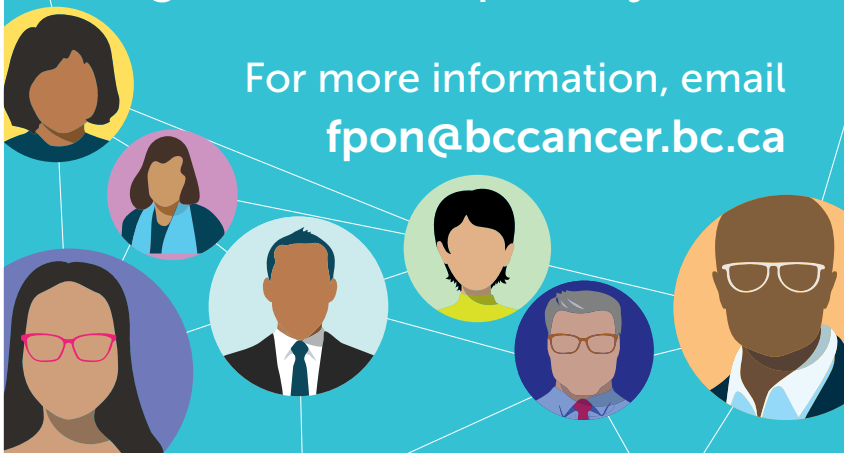
*see References on page 19*

# Save the Date for FPON's Spring 2022 Virtual CME Day

## Saturday April 2, 2022 8:30 a.m. – 12:30 p.m.

An interactive opportunity to  
enhance cancer care knowl-  
edge relevant to primary care.

For more information, email  
[fpon@bccancer.bc.ca](mailto:fpon@bccancer.bc.ca)



*What is possible in Golden, BC  
continued from page 9*

huge amount of satisfaction with helping someone with the cancer journey no matter their outcome."

When asked how she stays up to date with cancer care, Dr. Larsen-Soles points to the multifaceted support available through BC Cancer. "I love that GPOs can now attend sessions of the didactic portion of GPO Education virtually as a refresher. Recently, I chose topics where I know things have changed both in management and resulting impact. I attend GPO Case Study Day and find the monthly newsletters helpful. In addition to connecting with local oncologists, I try to catch some of FPON's monthly webcasts and look to the BC Cancer website."

Contact Dr. Trina Larsen-Soles at  
[dr.t.larsensoles@gmail.com](mailto:dr.t.larsensoles@gmail.com)

### FOR MORE INFORMATION

To learn more about the Family Practice Oncology Network or become involved, please email [FPON@bccancer.bc.ca](mailto:FPON@bccancer.bc.ca) or visit [www.fpon.ca](http://www.fpon.ca)

The content of articles in this Journal represent the views of the named authors and do not necessarily represent the position of BC Cancer, PHSa or any other organization.

ISSN 2369-4165 (Print)

ISSN 2369-4173 (Online)

Key title: Journal of family practice oncology

Publications Mail Agreement Number 41172510

Return all undeliverable Canadian

Addresses to BC Cancer, 600 West 10th Ave,  
Vancouver, BC V5Z 4E6

Unresectable/metastatic lung cancer in 2021  
continued from page 3

## References

1. BC Cancer Incidence Rates. 2020; <http://www.bccancer.bc.ca/health-info/disease-systemstatistics/cancer-incidence-rates>. Accessed July 11, 2021.
2. Canadian Cancer Statistics: A 2020 special report on lung cancer. . 2020; [cancer.ca/Canadian-Cancer-Statistics-2020-EN](http://cancer.ca/Canadian-Cancer-Statistics-2020-EN). Accessed July 11, 2021.
3. Ko JJ, Tudor R, Li H, et al. Reasons for lack of referral to medical oncology for systemic therapy in stage IV non-small-cell lung cancer: comparison of 2003-2006 with 2010-2011. *Current oncology*. Dec 2017;24(6):e486-e493.
4. Ho C, Ramsden K, Zhai Y, et al. Less toxic chemotherapy improves uptake of all lines of chemotherapy in advanced non-small-cell lung cancer: a 10-year retrospective population-based review. *Journal of thoracic oncology : official publication of the International Association for the Study of Lung Cancer*. Aug 2014;9(8):1180-1186.
5. Lewis DR, Check DP, Caporaso NE, Travis WD, Devesa SS. US lung cancer trends by histologic type. *Cancer*. Sep 15 2014;120(18):2883-2892.
6. Yu M, Feuer EJ, Cronin KA, Caporaso NE. Use of multiple imputation to correct for bias in lung cancer incidence trends by histologic subtype. *Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology*. Aug 2014;23(8):1546-1558.
7. Hanna NH, Robinson AG, Temin S, et al. Therapy for Stage IV Non-Small-Cell Lung Cancer With Driver Alterations: ASCO and OH (CCO) Joint Guideline Update. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. Mar 20 2021;39(9):1040-1091.
8. Ramalingam SS, Vansteenkiste J, Planchard D, et al. Overall Survival with Osimertinib in Untreated, EGFR-Mutated Advanced NSCLC. *The New England journal of medicine*. Jan 2 2020;382(1):41-50.
9. Reck M, Rodriguez-Abreu D, Robinson AG, et al. Pembrolizumab versus Chemotherapy for PD-L1-Positive Non-Small-Cell Lung Cancer. *The New England journal of medicine*. Nov 10 2016;375(19):1823-1833.
10. Herbst RS, Garon EB, Kim DW, et al. 5-Year Survival Update From KEYNOTE-010: Pembrolizumab Versus Docetaxel for Previously Treated, Programmed Death Ligand 1-Positive Advanced Non-Small-Cell Lung Cancer. *Journal of thoracic oncology : official publication of the International Association for the Study of Lung Cancer*. May 25 2021.
11. Paz-Ares L, Dvorkin M, Chen Y, et al. Durvalumab plus platinum-etoposide versus platinum-etoposide in first-line treatment of extensive-stage small-cell lung cancer (CASPIAN): a randomised, controlled, open-label, phase 3 trial. *Lancet*. Nov 23 2019;394(10212):1929-1939.
12. Indication: First-line treatment of adult patients with ESSCLC in combination with etoposide and either carboplatin or cisplatin. 2021; <https://cadth.ca/sites/default/files/pcodr/Reviews2021/PC0234%20Imfinzi%20-%20Draft%20CADTH%20Recommendation%20For%20posting%20June%2010,%202021.pdf>. Accessed July 11, 2021.
13. Basch E, Deal AM, Dueck AC, et al. Overall Survival Results of a Trial Assessing Patient-Reported Outcomes for Symptom Monitoring During Routine Cancer Treatment. *Jama*. Jul 11 2017;318(2):197-198.
14. Temel JS, Greer JA, Muzikansky A, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. *The New England journal of medicine*. Aug 19 2010;363(8):733-742.

Smoking cessation in cancer care  
continued from page 5

## References

- Canadian Partnership Against Cancer (2019). Implementing Smoking Cessation in Cancer Care across Canada – A framework for Action. Retrieved from <https://www.partnershipagainstcancer.ca/topics/smoking-cessation-framework/> , Accessed: August 13, 2021
- Canadian Partnership Against Cancer (2020). Smoking Cessation in Cancer Care Across Canada. Retrieved from <https://www.partnershipagainstcancer.ca/topics/smoking-cessation-cancer-care/> , Accessed: August 13, 2021
- CAN-ADAPTT. (2011). Canadian Smoking Cessation Clinical Practice Guideline. Toronto, Canada: Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment, Centre for Addiction and Mental Health. Retrieved from: <https://www.nicotinedependenceclinic.com/en/canadapt>
- Eng, L., Alton, D., Song, Y., Su, J., Zhang, Q., Che, J., ... Liu, G. (2019). Awareness of the Harms of Continued Smoking Among Cancer Survivors. *Supportive Care in Cancer*. <https://doi.org/10.1007/s00520-019-05175-4>
- National Center for Chronic Disease Prevention and Health Promotion (US) Office on Smoking and Health. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta (GA): Centers for Disease Control and Prevention (US); 2014. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK179276/>
- Warren GW, Cartmell KB, Garrett-Mayer E, Salloum RG, Cummings KM. Attributable Failure of First-line Cancer Treatment and Incremental Costs Associated With Smoking by Patients With Cancer. *JAMA Netw Open*. 2019;2(4):e191703. doi:10.1001/jamanetworkopen.2019.1703 Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2729804>



## References

1. de Lemos J, Loewen P, Nagle C, McKenzie R, You YD, Dabu A et al. Preventable adverse drug events causing hospitalisation: identifying root causes and developing a surveillance and learning system at an urban community hospital, a cross-sectional observational study. *BMJ Open Quality* 2021;10:e001161. doi:10.1136/bmjopen-2020-001161

2. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes. *Canadian Journal of Diabetes* 2013; 37,S1:S209. Appendix 7 Sick Day Medication List.
3. Provider sick day plan link. Sick day Medication Management (for Physicians and Pharmacists). [https://www.vchri.ca/sites/default/files/Richmond/sick\\_day\\_medication\\_management\\_for\\_physicians\\_and\\_pharmacists.pdf](https://www.vchri.ca/sites/default/files/Richmond/sick_day_medication_management_for_physicians_and_pharmacists.pdf)

4. Your Medication Plan for Sick Days (for Patients and Families). <https://vch.eduhealth.ca/en/permalink/phem3691>

## References

1. Kim HS, Chapiro J, Geschwind J-FH. From the Guest Editor. *Cancer J* [Internet]. 2016 Nov;22(6):363–4. Available from: <https://journals.lww.com/00130404-201611000-00001>
2. Hickey R, Vouche M, Sze DY, Hohlastos E, Collins J, Schirmang T, et al. Cancer Concepts and Principles: Primer for the Interventional Oncologist—Part II. *J Vasc Interv Radiol* [Internet]. 2013;24(8):1167–88. Available from: <http://dx.doi.org/10.1016/j.jvir.2013.04.023>
3. Ahmed M, Solbiati L, Brace CL, Breen DJ, Callstrom MR, Charboneau JW, et al. Image-guided tumor ablation: Standardization of terminology and reporting criteria—A 10-year update. *J Vasc Interv Radiol* [Internet]. 2014;25(11):1691–1705.e4. Available from: <http://dx.doi.org/10.1016/j.jvir.2014.08.027>
4. Hinshaw JL, Lubner MG, Ziemlewicz TJ, Lee FT, Brace CL. Percutaneous Tumor Ablation Tools: Microwave, Radiofrequency, or Cryoablation—What Should You Use and Why? *RadioGraphics* [Internet]. 2014 Sep;34(5):1344–62. Available from: <http://pubs.rsna.org/doi/10.1148/rg.345140054>
5. Qian L, Shen Y, Xie J, Meng Z. Immunomodulatory effects of ablation therapy on tumors: Potentials for combination with immunotherapy. *Biochim Biophys Acta - Rev Cancer* [Internet]. 2020;1874(1):188385. Available from: <https://doi.org/10.1016/j.bbcan.2020.188385>

6. Khan MA, Deib G, Deldar B, Patel AM, Barr JS. Efficacy and Safety of Percutaneous Microwave Ablation and Cementoplasty in the Treatment of Painful Spinal Metastases and Myeloma. *Am J Neuroradiol* [Internet]. 2018 Jul;39(7):1376–83. Available from: <http://www.ajnr.org/lookup/doi/10.3174/ajnr.A5680>
7. Salapura V, Jeromel M. Minimally invasive (percutaneous) treatment of metastatic spinal and extraspinal disease—a review. *Acta Clin Croat* [Internet]. 2014 Mar;53(1):44–54. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24974666>
8. Kandarpa K, Machan L, Durham J. *Handbook of Interventional Radiologic Procedures*. 5th ed. Philadelphia, PA: Wolters Kluwer; 2016. 776 p.
9. Lee EJ, Chung HW, Jo J-H, So Y. Radioembolization for the Treatment of Primary and Metastatic Liver Cancers. *Nucl Med Mol Imaging* (2010) [Internet]. 2019 Dec 8;53(6):367–73. Available from: <http://link.springer.com/10.1007/s13139-019-00615-9>
10. Katsanos K, Kitrou P, Spiliopoulos S, Maroulis I, Petsas T, Karnabatidis D. Comparative effectiveness of different transarterial embolization therapies alone or in combination with local ablative or adjuvant systemic treatments for unresectable hepatocellular carcinoma: A network meta-analysis of randomized controlled trials. Lu S-N, editor. *PLoS One* [Internet]. 2017 Sep 21;12(9):e0184597. Available from: <https://dx.plos.org/10.1371/journal.pone.0184597>

11. Georgiades C, Kim HS. Image-Guided Interventions in Oncology [Internet]. Georgiades C, Kim HS, editors. Cham: Springer International Publishing; 2020. Available from: <http://link.springer.com/10.1007/978-3-030-48767-6>
12. Walser EM. Venous Access Ports: Indications, Implantation Technique, Follow-Up, and Complications. *Cardiovasc Intervent Radiol* [Internet]. 2012 Aug 16;35(4):751–64. Available from: <http://link.springer.com/10.1007/s00270-011-0271-2>
13. Holly BP, Funaki B, Lessne ML. Inferior Vena Cava Filters: Why, Who, and for How Long? *Clin Chest Med* [Internet]. 2018;39(3):645–50. Available from: <https://doi.org/10.1016/j.ccm.2018.04.015>
14. Lanciego C, Pangua C, Chacón JI, Velasco J, Boy RC, Viana A, et al. Endovascular Stenting as the First Step in the Overall Management of Malignant Superior Vena Cava Syndrome. *Am J Roentgenol* [Internet]. 2009 Aug;193(2):549–58. Available from: <http://www.ajronline.org/doi/10.2214/AJR.08.1904>
15. Ha T, Madoff D, Li D. Symptomatic Fluid Drainage: Tunneled Peritoneal and Pleural Catheters. *Semin Intervent Radiol* [Internet]. 2017 Dec 14;34(04):337–42. Available from: <http://www.thieme-connect.de/DOI/DOI?10.1055/s-0037-1608704>
16. Filippidis DK, Tselikas L, Tsitskari M, Kelekis A, de Baere T, Ryan AG. Percutaneous Neurolysis for Pain Management in Oncological Patients. *Cardiovasc Intervent Radiol* [Internet]. 2019;42(6):791–9. Available from: <https://doi.org/10.1007/s00270-019-02185-x>

A summer to remember  
continued from page 10

## References

1. Disparity in cancer care: a Canadian perspective: S. Ahmed, MD\*† and R.K. Shahid, MD†, 2012; Current Oncology; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3503668/>

2. First Nations Cancer Control in Canada Baseline Report: Canadian Partnership Against Cancer; 2017; <https://www.partnershipagainstcancer.ca/wp-content/uploads/2017/12/first-nations-cancer-control-baseline-report.pdf>

Exercise and cancer care  
continued from page 16

## References

1. Campbell, K.L., Winters-Stone, K.M., Wiskemann, J., et al. (2019). Exercise guidelines for cancer survivors: Consensus statement from international multidisciplinary roundtable. *Medicine & Science in Sports & Exercise*, 51(11), 2375-2390.
2. Patel, A.V., Friedenreich, C.M., Moore, S.C., et al. (2019). American College of Sports Medicine Roundtable Report on physical activity, sedentary behavior, and cancer prevention and control. *Medicine & Science in Sports & Exercise*, 51(11), 2391-2402.
3. McKenzie, D.C., Kalda A.L. (2003). Effects of upper extremity exercise on secondary lymphedema in breast cancer patients: a pilot study. *J Clin Oncol*;21(3):463-466.
4. An, K-Y, Arthuso,F.Z., Kang, D-W. et al. (2020) Exercise and health-related fitness predictors of chemotherapy completion in breast cancer patients: Pooled analysis of START and CARE trials – submitted for publication.
5. Adams, S.C., Segal, R.J., McKenzie, D.C. et al. (2016). Effects of resistance and aerobic exercise on sarcopenia and dynapenia in breast cancer patients receiving adjuvant chemotherapy: a multicenter randomized control trial. *Breast Cancer Res Treat.* Aug; 158(3):497-507.
6. Campbell, K.L., Kam, J.W.Y., Neil-Sztramko, S.E. et al. (2018). Effects of aerobic exercise on cancer associated cognitive impairment: A proof-of-concept RCT. *Pyschooncology* Jan 11. doi: 10.1002/pon.4370
7. Kirkham, A.A., Shave, R.E., Bland, K.A. et al. (2017). Protective effects of acute exercise prior to doxorubicin on cardiac function of breast cancer patients: A proof-of-concept RCT. *Int J Cardiol.* Oct 15;245:263-270.
8. Cormie, P., Atkinson, M., Bucci, L., et al. (2018). Clinical Oncology Society of Australia position statement on exercise in cancer care. *The Medical Journal of Australia*, 209, 184-187.
9. Schmitz, K.H., Courneya, K.S., Matthews, C., et al. (2010). American College of Sports medicine roundtable on exercise guidelines for cancer survivors. *Medicine & Science in Sports & Exercise*, 42, 1409-1426.
10. McTiernan, A., Friedenreich C.M., Katzmarzyk, P.T., et al., (2019). Physical activity in cancer prevention and survival: A systematic review. *Medicine & Science in Sports & Exercise*, 51(6), 1252-1261.
11. Roberts, A., Wilson, R., Gaul, C.A. (2021). Incorporating exercise prescriptions into medical education. *BC Medical Journal*, 63(6), 238-241.
12. Holtz, K.A., Kokotilo, K.J., Fitzgerald, B.E., et al. (2013). Exercise behaviour and attitudes among fourth-year medical students at the University of British Columbia. *Can Fam Physician*, 59e:26-32.
13. Golightly, Y.M., Allen, K.D., Ambrose, K.R., et al. (2017). Physical Activity as a vital sign: A systematic review. *Prev Chronic Disease*, 14:E123.

## References

1. Delaney G, Jacob S, Featherstone C, Barton M. The role of radiotherapy in cancer treatment: estimating optimal utilization from a review of evidence-based clinical guidelines. *Cancer* 2005;104:1129-1137.
2. Citrin DE. Recent Developments in Radiotherapy. *N Engl J Med* 2017;377(22):2200-2201.
3. Bentzen SM. Preventing or reducing late side effects of radiation therapy: radiobiology meets molecular pathology. *Nat Rev Cancer* 2006;6(9):702-13.
4. BC Cancer Agency. Care of Radiation Therapy Side Effects Head and Neck. Vancouver; BC: BC Cancer Agency; 2021. Available from: [http://www.bccancer.bc.ca/patient-and-public-info-site/Documents/RT Side Effects Education Materials/Care-of-Radiation-Therapy-Side-Effects-Head-and-Neck.pdf](http://www.bccancer.bc.ca/patient-and-public-info-site/Documents/RT%20Side%20Effects%20Education%20Materials/Care-of-Radiation-Therapy-Side-Effects-Head-and-Neck.pdf). Accessed 2021 August 18.
5. BC Cancer Agency. Symptom Management Guidelines: Fatigue. Vancouver; BC: BC Cancer Agency; 2018. Available from: [http://www.bccancer.bc.ca/nursing-site/Documents/6. Fatigue and Anemia.pdf](http://www.bccancer.bc.ca/nursing-site/Documents/6_Fatigue_and_Anemia.pdf). Accessed 2021 August 18.
6. BC Cancer Agency. Symptom Management Guidelines: Radiation Dermatitis. Vancouver; BC: BC Cancer Agency; 2013. Available from: [http://www.bccancer.bc.ca/nursing-site/Documents/Symptom Management Guidelines/14RadiationDermatitis.pdf](http://www.bccancer.bc.ca/nursing-site/Documents/Symptom%20Management%20Guidelines/14RadiationDermatitis.pdf). Accessed 2021 August 18.
7. Elad S, Cheng KKF, Lalla RV, Yarom N, Hong C, Logan RM, et al. "MASCC/ISOO clinical practice guidelines for the management of mucositis secondary to cancer therapy." *Cancer* vol. 126,19 (2020): 4423-4431.
8. Ma SJ, Rivers CI, Serra LM, Singh AK. Long-term outcomes of interventions for radiation-induced xerostomia: A review. *World J Clin Oncol*. 2019;10(1):1-13.
9. BC Cancer Agency. Care of Radiation Therapy Side Effects Head and Neck. Vancouver; BC: BC Cancer Agency; 2021. Available from: [http://www.bccancer.bc.ca/patient-and-public-info-site/Documents/RT Side Effects Education Materials/Care-of-Radiation-Therapy-Side-Effects-Head-and-Neck.pdf](http://www.bccancer.bc.ca/patient-and-public-info-site/Documents/RT%20Side%20Effects%20Education%20Materials/Care-of-Radiation-Therapy-Side-Effects-Head-and-Neck.pdf). Accessed 2021 August 18.
10. Hanania AN, Mainwaring W, Ghebre YT, Hanania NA, Ludwig M. Radiation-Induced Lung Injury: Assessment and Management. *Chest* 2019;156(1):150-162.
11. Dilalla V, Chaput G, Williams T, Sultanem K. Radiotherapy side effects: integrating a survivorship clinical lens to better serve patients. *Curr Oncol* 2020;27(2):107-12.
12. Cancer.Net. Managing Physical Side Effects: Urinary Incontinence. Alexandria; Virginia: Cancer.Net; 2021. Available from: <https://www.cancer.net/coping-with-cancer/physical-emotional-and-social-effects-cancer/managing-physical-side-effects/urinary-incontinence>. Accessed 2021 August 18.
13. Chaput G, Ibrahim M, Towers A. Cancer-related lymphedema: clinical pearls for providers. *Curr Oncol* 2020;27(6):336-340.
14. Canadian Association of Psychosocial Oncology. *Pan-Canadian Practice Guideline: Screening, Assessment and Management of Psychosocial Distress, Depression and Anxiety in Adults with Cancer*. Toronto; ON: Canadian Partnership Against Cancer and the Canadian Association of Psychosocial Oncology; 2015. Available from: <https://capo.ca/resources/Documents/Guidelines/3APAN--1.PDF>. Accessed 2021 August 18.
15. Pitman A, Suleman S, Hyde N, Hodgkiss A. Depression and anxiety in patients with cancer. *BMJ* 2018; 361:1415.
16. National Comprehensive Cancer Network (NCCN). *NCCN Clinical Practice Guidelines in Oncology: Cancer-related Fatigue*. Plymouth Meeting; Pennsylvania: National Comprehensive Cancer Network; 2019. Available from: [https://www.nccn.org/professionals/physician\\_gls/pdf/fatigue.pdf](https://www.nccn.org/professionals/physician_gls/pdf/fatigue.pdf). Accessed 2021 August 19.
17. Carpenter DJ, Mowery YM, Broadwater G, et al. The risk of carotid stenosis in head and neck cancer patients after radiation therapy. *Oral Oncol* 2018; 80:9-15.
18. Colevas AD, Yom SS, Pfister DG, Spencer S, Adelstein D, Adkins D, et al. NCCN guidelines insights: head and neck cancers, version 1.2018. *J Natl Compr Canc Netw* 2018;16(5):479-90.
19. Wang H, Wei J, Zheng Q, et al. Radiation-induced heart disease: a review of classification, mechanism and prevention. *Int J Biol Sci* 2019;15(10):2128-2138.
20. Armenian SH, Lacchetti C, Lenihan D. Prevention and Monitoring of Cardiac Dysfunction in Survivors of Adult Cancers: American Society of Clinical Oncology Clinical Practice Guideline Summary. *J Oncol Pract* 2017;13(4):270-275.
21. Giuranno L, Ient J, De Ruyscher D, Vooijs MA. Radiation-Induced Lung Injury (RILI). *Front Oncol* 2019; 9:877.
22. Deng G, Liang N, Xie J, Luo H, Qiao L, Zhang J, et al. Pulmonary toxicity generated from radiotherapeutic treatment of thoracic malignancies. *Oncology letters* 2017;14(1):501-11.
23. Adams E, Boulton MG, Horne A, Rose PW, Durrant L, Collingwood M, et al. The effects of pelvic radiotherapy on cancer survivors: symptom profile, psychological morbidity and quality of life. *Clinical Oncology* 2014;26(1):10-7.
24. Andreyev HJ, Muls AC, Norton C, Ralph C, Watson L, Shaw C, et al. Guidance: The practical management of the gastrointestinal symptoms of pelvic radiation disease. *Frontline Gastroenterol* 2015;6(1):53-72.
25. Lawrie TA, Green JT, Beresford M, Wedlake L, Burden S, Davidson SE, et al. Interventions to reduce acute and late adverse gastrointestinal effects of pelvic radiotherapy for primary pelvic cancers. *Cochrane Database Syst Rev* 2018;1:CD012529.
26. Canadian Cancer Society. *Sex, Intimacy and Cancer*. Toronto; ON: Canadian Cancer Society; 2018. Available from: [https://www.cancer.ca/~media/cancer.ca/CW/publications/Sex%20intimacy%20and%20cancer/32061-1-NO.pdf](https://www.cancer.ca/~/media/cancer.ca/CW/publications/Sex%20intimacy%20and%20cancer/32061-1-NO.pdf). Accessed 2021 August 13.
27. Berkey FJ. Managing the adverse effects of radiation therapy. *Am Fam Physician* 2010;82(4):381-388.