

Systemic Therapy Update

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For Health Professionals Who Care for Cancer Patients

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Resources and Contact Information

Editor's Choice

New Programs

The BC Cancer Provincial Systemic Therapy Program has approved the following new treatment programs effective 01 March 2021. The full details of these programs are found on the BC Cancer website in the Chemotherapy Protocols section.

Breast

Palbociclib and Fulvestrant with or without LHRH Agonist for Advanced Breast Cancer (UBRAVPBFLV) —

The BC Cancer Breast Tumour Group is implementing combination therapy with palbociclib, a CDK 4/6 inhibitor, and fulvestrant, an estrogen receptor antagonist, for patients with advanced breast cancer. Eligible patients include post-menopausal women and men with ER-positive, HER2-negative advanced breast cancer with metastatic disease, including women with chemically induced menopause using a LHRH agonist. Please consult the protocol for full eligibility details. BC Cancer Compassionate Access Program (CAP) approval is required.

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Approval for this new treatment program is based on the phase III PALOMA-3 trial of palbociclib in combination with fulvestrant in women with HR-positive, HER2-negative advanced breast cancer. Patients were randomized to palbociclib or placebo, both on a background of fulvestrant. Eligible patients may have received up to one previous line of chemotherapy for advanced breast cancer. The median progression-free survival improved significantly in the palbociclib group (9.2 months vs. 3.8 months, HR 0.42, 95% CI 0.32-0.56). Hematologic grade 3 or 4 adverse events occurred more frequently in the palbociclib group, including neutropenia (62% vs. 0.6%), leukopenia (25% vs. 0.6%), anemia (2.6% vs. 1.7%) and thrombocytopenia (2.3% vs. 0%).

Gastrointestinal

Trifluridine-Tipiracil as Third-Line Therapy for Advanced Gastroesophageal Carcinoma (GIGAVTRIFT) — The BC Cancer Gastrointestinal Tumour Group is introducing trifluridine-tipiracil, an oral third-line treatment option for patients with advanced gastroesophageal carcinoma. Trifluridine, the active cytotoxic component, is a thymidine-based antimetabolite that incorporates into DNA, resulting in DNA dysfunction. The tipiracil component allows for the maintenance of adequate levels of trifluridine by blocking its rapid degradation. Eligible patients should have received two prior lines of therapy including fluoropyrimidine, platinum, taxane or irinotecan, and HER2-targeted therapy (if HER2-positive). Trifluridine-tipiracil is administered twice daily with food at the morning and evening meals, on days 1-5 and days 8-12 of each 28-day cycle.

Approval for this new treatment program is based on the phase III TAGS trial of trifluridine-tipiracil in patients with disease refractory or intolerant to at least two prior therapies.^{3, 4} Compared with placebo, trifluridine-tipiracil was associated with a statistically significant and clinically meaningful improvement in median overall survival (5.7 months vs 3.6 months, HR 0.69, 95% CI 0.56-0.86). The one-year overall survival rate was 21% in the trifluridine-tipiracil group compared to 13% in the placebo group. A higher proportion of grade 3 or greater adverse events (AEs) occurred in the trifluridine-tipiracil group (79.7% vs. 57.7%); the most common grade 3 or greater AEs in the trifluridine-tipiracil group included neutropenia and anemia, whereas physical health deterioration, abdominal pain and anemia were most common in the placebo group.

Neuroendocrine Tumours (UGIPRRT) — The BC Cancer Gastrointestinal Tumour Group is implementing peptide receptor radionuclide therapy (PRRT) with lutetium-177 (¹⁷⁷Lu)-dotatate for patients with well-differentiated, unresectable somatostatin receptor-positive midgut neuroendocrine tumours. The majority of advanced, well-differentiated neuroendocrine tumours express high levels of somatostatin receptors. PRRT, also known as radiolabeled somatostatin analogue therapy, allows the delivery of radionuclides directly to tumour cells. ¹⁷⁷Lu-dotatate is comprised of a ¹⁷⁷Lu-radiolabelled somatostatin peptide analogue. Review at the BC Cancer Provincial Gastrointestinal Cancers Multidisciplinary Conference and BC Cancer CAP approval are required prior to treatment. Treatment is by IV infusion every 8 weeks, for a maximum of 4 doses, and is currently delivered at BC Cancer Vancouver Centre only.

Approval for this new treatment program is based on the phase III NETTER-1 trial of 177 Lu-dotatate in patients with advanced somatostatin receptor-positive midgut neuroendocrine tumours. 5,6 Patients were randomized to receive treatment with 177 Lu-dotatate or high-dose octreotide LAR (control group). At the time of the primary analysis, the median progression-free survival was 8.4 months in the control group but had not yet been reached in the 177 Lu-dotatate group (HR 0.21, 95% CI 0.13-0.33). The estimated rate

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of progression-free survival at month 20 was considerably higher in the ¹⁷⁷Lu-dotatate group (65.2% vs. 10.8%). Grade 3 or 4 neutropenia, thrombocytopenia and lymphopenia occurred in 1%, 2% and 9%, respectively, of patients in the ¹⁷⁷Lu-dotatate group as compared with no patients in the control group.

Genitourinary

Pembrolizumab and Axitinib for Metastatic Renal Cell Carcinoma (GUAVPEMAX) — The BC Cancer Genitourinary Tumour Group is introducing the first PD-1 checkpoint inhibitor/VEGF tyrosine kinase inhibitor combination regimen for the first-line treatment of patients with metastatic renal cell carcinoma (RCC). Patients with metastatic RCC are eligible for this treatment irrespective of tumour histology, risk group or level of PD-L1 expression. Administration of pembrolizumab is every 3 weeks to a maximum of 2 years of treatment; axitinib is administered twice daily and continued until disease progression.

Approval for this treatment program is based on the phase III KEYNOTE-426 trial of pembrolizumab plus axitinib in previously untreated patients with advanced RCC.^{7,8} Pembrolizumab plus axitinib demonstrated a significant improvement in median progression free survival when compared to single-agent sunitinib (15.1 months vs. 11.1 months, HR 0.69, 95% CI 0.57-0.84). Although median overall survival had not yet been reached in either treatment group, there was a statistically significant improvement in favour of the pembrolizumab plus axitinib group in the intention-to-treat population (HR 0.53, 95% CI 0.38-0.74). Grade 3 or higher adverse events were slightly more common in the pembrolizumab plus axitinib group (75.8% vs. 70.6%), most commonly including hypertension (21.2% vs. 18.4%) followed by diarrhea (7.2% vs. 4.5%).

Sarcoma

Eribulin for Metastatic Liposarcoma and Leiomyosarcoma (SAAVERIB) — The BC Cancer Sarcoma Tumour Group is introducing eribulin, a non-taxane microtubule inhibitor, as a new treatment option for patients with incurable locally recurrent, locally advanced or metastatic liposarcoma or leiomyosarcoma. Eligibility for this treatment program includes previous treatment with at least two chemotherapy regimens for advanced disease. Eribulin administration is on days 1 and 8 of a 21-day cycle; treatment is continued until disease progression or unacceptable toxicity. Alternative treatment regimens for liposarcoma and leiomyosarcoma include, but are not limited to, doxorubicin-, ifosfamide- and taxane-based regimens (e.g., SAAVA, SAAVI, SAAI, SAIME, SAAVIME3, SAAVGEMD, SAAVADIC, SADTIC).

Approval for this treatment program comes from a phase III trial of eribulin compared to dacarbazine in patients with advanced liposarcoma or leiomyosarcoma. Median overall survival was significantly improved in patients assigned to eribulin (13.5 months vs. 11.5 months, HR 0.77, 95% CI 0.62-0.95). A subgroup analysis, while underpowered, suggested that the benefit with eribulin seemed greater in patients with liposarcoma (15.6 months vs. 8.4 months) than in those with leiomyosarcoma (12.7 months vs. 13.0 months). Grade 3 or higher adverse events were more common in patients who received eribulin (67% vs. 56%), with the majority of grade 3 to 4 toxicities in both groups being hematologic.

References

- Pan-Canadian Oncology Drug Review (pCODR) Expert Review Committee (pERC). Final recommendation for trifluridine/tipiracil (Lonsurf®) for gastric cancer. 24 Mar 2020.
- Shitara K, Doi T, Dvorkin M, et al. Trifluridine/tipiracil versus placebo in patients with heavily pretreated metastatic gastric cancer (TAGS): a randomised, double-blind, placebo-controlled, phase 3 trial. Lancet Oncol 2018;19:1437-1448. https://doi.org/10.1016/S1470-2045(18)30739-3
- 3. Pan-Canadian Oncology Drug Review (pCODR) Expert Review Committee (pERC). Final recommendation for palbociclib (Ibrance®) plus fulvestrant (Faslodex®) for advanced breast cancer. 03 May 2019.
- Turner NC, Ro J, André F, et al. Palbociclib in hormone-receptor-positive advanced breast cancer. N Engl J Med 2015;373:209-219. https://doi.org/10.1056/NEJMoa1505270

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- Strosberg J, El-Haddad G, Wolin E, et al. Phase 3 trial of ¹⁷⁷Lu-dotatate for midgut neuroendocrine tumors. N Engl J Med 2017;176:125-135. https://doi.org/10.1056/NEJMoa1607427
- 6. Pan-Canadian Oncology Drug Review (pCODR) Expert Review Committee (pERC). Final recommendation for lutetium ¹⁷⁷Lu-dotatate (Lutathera®) for gastroenteropancreatic neuroendocrine tumours. 01 Aug 2019.
- 7. Rini BI, Plimack, ER, Stus R, et al. Pembrolizumab plus axitinib versus sunitinib for advanced renal-cell carcinoma. *N Engl J Med* 2019;380: 1116-1127. https://doi.org/10.1056/NEJMoa1816714
- 8. Pan-Canadian Oncology Drug Review (pCODR) Expert Review Committee (pERC). Final recommendation for pembrolizumab (Keytruda®) plus axitinib (Inlyta®) for advanced renal cell carcinoma. 02 Apr 2020.
- Schöffski P, Chawla S, Maki RG, et al. Eribulin versus dacarbazine in previously treated patients with advanced liposarcoma or leiomyosarcoma: a randomised, open-label, multicentre, phase 3 trial. *Lancet* 2016;387:1629-1637. https://doi.org/10.1016/S0140-6736(15)01283-0

Drug Shortages

The following are updates of drug supply shortages in BC. Full details about new, updated or resolved drug shortages, including recommended treatment alternatives, are found in the *Briefing Notes* and email communications previously circulated to BC Cancer and the Community Oncology Network (CON).

Updated

Hyaluronidase

(Adapted from BC Cancer Briefing Note Update 08Feb2021)

Hyaluronidase (AMPHADASE®) has recently become available via the Health Canada Special Access Programme (SAP). Although the previous hyaluronidase formulation (HYALASE®) is no longer available for ordering, some pharmacies may still have HYALASE® supply. The strength and presentation of AMPHADASE® (150 U/mL, 2 mL vial) are different from those of HYALASE® (1500 U ampoule). There are no comparative efficacy or safety data between the different hyaluronidase formulations, and therefore dosing recommendations reflect the available formulations. BC Cancer Policy III-20 — Prevention and Management of Extravasation of Chemotherapy is being updated accordingly.

Extravasated drugs	Dosing and administration of hyaluronidase
vinblastine	HYALASE®: Dissolve hyaluronidase 1500 units in 1 mL water for injection or 0.9% sodium chloride injection and draw into one syringe.
vincristine	AMPHADASE®: Draw hyaluronidase 150 units (1 mL) into one syringe.
vindesine vinorelbine	Infiltrate subcutaneously into/around the extravasation site (as soon as possible after extravasation) in small (0.2 mL) aliquots using a 25-gauge needle. Anesthetize the skin surface with Pain Ease® spray if the patient cannot tolerate the subcutaneous injections.

Leuprolide

(Adapted from BC Cancer Briefing Note Update 08Feb2021)

The backorder for leuprolide (LUPRON DEPOT®) 30 mg (4-month) injection has been extended; stock is now expected to be available at the end of March 2021. BC Cancer centre pharmacies and some Community Oncology Network hospitals are reporting low inventory or shortages. BC Cancer centre pharmacies will confirm what action is required.

Education Corner

Early, Severe 5-FU or Capecitabine Toxicity – Possible DPD Deficiency

Early, severe and life-threatening toxicities are occasionally seen with 5-fluorouracil or capecitabine (fluoropyrimidine) chemotherapy. Unexpectedly early and severe side effects such as mucositis, diarrhea, neutropenia and neurotoxicity may be associated with **dihydropyrimidine dehydrogenase (DPD) deficiency**, an inherited disorder of pyrimidine metabolism that may be present in about 3% of the population. Because fluoropyrimidine metabolism and clearance are dependent on the DPD enzyme, active metabolites can accumulate in DPD-deficient patients treated with fluoropyrimidines, resulting in the unexpected early and severe presentation of side effects. Management of such side effects should include aggressive supportive care with hemodynamic support, parenteral nutrition, antibiotics and hematopoietic colony stimulating factors. Further treatment with 5-fluorouracil or capecitabine should be reassessed if DPD deficiency is suspected.

References

- 1. Fluorouracil Monograph. Revised 1 January 2019. In: BC Cancer Drug Manual®. Badry, Nadine (editor). BC Cancer. Vancouver, British Columbia. Available at http://www.bccancer.bc.ca
- 2. Lunenburg CATC, van der Wouden CH, Nijenhu M, et al. Dutch Pharmacogenetics Working Group (DPWG) guideline for the gene-drug interaction of DPYD and fluoropyrimidines. *Eur J Human Gen* 2020;28:508-517. https://doi.org/10.1038/s41431-019-0540-0

Cancer Drug Manual[©]

All BC Cancer Drug Manual[©] documents can be accessed from the <u>Cancer Drug Manual</u>[©] home page on the BC Cancer website.

Revised Documents

Highlights of key changes are listed below:

Fulvestrant Monograph

Parenteral Administration: updated references to include new protocols

Dosage Guidelines: updated references and bolding/italicizing in adult dosing to include new protocols

Pembrolizumab Monograph

Uses: added renal cell carcinoma

Parenteral Administration: updated references to include new protocol

Dosage Guidelines: updated references and bolding/italicizing in adult dosing to include new protocol

Temsirolimus Patient Handout

Bullets (GET EMERGENCY HELP and SEE YOUR DOCTOR AS SOON AS POSSIBLE): updated side effects in final bullet sections based on recent CDM monograph changes

Tislelizumab Chemotherapy Preparation and Stability Chart

Precautions: Removed "do not use ChemoLock CSTD to puncture vial" as there is <u>no</u> incompatibility with ChemoLock

Trifluridine-Tipiracil Monograph

Dosage Guidelines: updated references and bolding/italicizing in adult dosing to include new protocol; updated renal dosing

Community Oncology Network (CON)

2020-2021 OSCAR Billing Deadline: 06 April 2021

The 2020-2021 fiscal year will end on Wednesday 31 March 2021. To meet the deadline for external reporting to the Ministry of Health, all claims for drug reimbursement for the current fiscal year must be submitted by **Tuesday 06 April 2021** via **OSCAR** (**O**nline **S**ystem for **C**ancer Drugs **A**djudication and **R**eimbursement). Any claims submitted after this date will not be eligible for reimbursement. For more information, please e-mail oscar@bccancer.bc.ca.

Benefit Drug List

New Programs

The following new treatment programs have been added to the BC Cancer <u>Benefit Drug List</u> effective 01 March 2021:

Protocol Title	Protocol Code	Benefit Status
Therapy of Advanced Breast Cancer using Palbociclib and Fulvestrant with or without LHRH Agonist	UBRAVPBFLV	Restricted
Third-Line Therapy for Advanced Gastroesophageal Carcinoma using Trifluridine- Tipiracil	GIGAVTRIFT	Class I
Peptide Receptor Radionuclide Therapy (PRRT) using ¹⁷⁷ Lu-Dotatate (LUTATHERA) for Treatment in Patients with Somatostatin Receptor Positive Midgut Neuroendocrine Tumours	UGIPRRT	Restricted
Treatment of Metastatic Renal Cell Carcinoma using Pembrolizumab and Axitinib	GUAVPEMAX	Class I
Palliative Therapy for Metastatic Sarcoma using Eribulin	SAAVERIB	Class I

Revised Programs

The following treatment program has been revised on the BC Cancer <u>Benefit Drug List</u> effective 01 March 2021:

Protocol Title	Protocol Code	Benefit Status
Palliative Treatment of Metastatic or Locally Advanced Gastric, Gastroesophageal Junction or Esophageal Adenocarcinoma using Cisplatin, Capecitabine and Trastuzumab	GIGAVCCT	Class I (Re-instated with revised eligibility; protocol previously deleted June 2020)

Highlights of New & Revised Protocols, PPPOs and Patient Handouts

BC Cancer Protocol Summaries, Provincial Pre-Printed Orders (PPPOs) and Patient Handouts are revised periodically. New, revised or deleted protocols, PPPOs and patient handouts for this month are listed below, with document revisions indicated in the respective columns. Protocol codes for treatment requiring BC Cancer Compassionate Access Program approval are prefixed with the letter **U**.

NEW Proto	NEW Protocols, PPPOs and Patient Handouts (new documents checked ☑)				
Protocol Code	Protocol Title	Protocol	PPPO	Handout	
UBRAVPBFLV	Therapy of Advanced Breast Cancer using Palbociclib and Fulvestrant with or without LHRH Agonist	$\overline{\checkmark}$			
GIGAVTRIFT	Third-Line Therapy for Advanced Gastroesophageal Carcinoma using Trifluridine-Tipiracil	$\overline{\checkmark}$			
UGIPRRT	Peptide Receptor Radionuclide Therapy (PRRT) using ¹⁷⁷ Lu-Dotatate (LUTATHERA) for Treatment in Patients with Somatostatin Receptor Positive Midgut Neuroendocrine Tumours		Ø		
GUAVPEMAX	Treatment of Metastatic Renal Cell Carcinoma using Pembrolizumab and Axitinib	$\overline{\checkmark}$		$\overline{\checkmark}$	
SAAVERIB	Palliative Therapy for Metastatic Sarcoma using Eribulin	$\overline{\checkmark}$			

REVISED P	REVISED Protocols, PPPOs and Patient Handouts (revisions in respective columns)				
Protocol Code	Protocol Title	Protocol	PPPO	Handout	
BR Breast					
BRAJCAP	Therapy of Adjuvant Breast Cancer using Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated		
BRAJPAM	Adjuvant Therapy for Breast Cancer in Postmenopausal Women using Pamidronate	Dose Modification clarified (renal)			
BRAVCAP	Therapy of Metastatic Breast Cancer using Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated		
BRAVEVEX	Therapy for Advanced Breast Cancer using Everolimus and Exemestane	Eligibility updated			
BRAVLCAP	Therapy for Metastatic Breast Cancer using Capecitabine and Lapatinib	Dose calculation table removed; dose rounding link updated	Dose rounding link updated		

REVISED P	rotocols, PPPOs and Patient Hand	outs (revisions in re	spective columns)	
Protocol Code	Protocol Title	Protocol	PPPO	Handout
UBRAVPALAI	Therapy of Advanced Breast Cancer using Palbociclib and Aromatase Inhibitor with or without LHRH Agonist	Eligibility and Exclusions updated		
BRAVPAM	Prevention of Skeletal-Related Events Secondary to Breast Cancer Metastases using Pamidronate		Dose Modification clarified (renal)	
UBRAVRBFLV	Therapy of Advanced Breast Cancer using Ribociclib and Fulvestrant with or without LHRH Agonist	Treatment note added	Return Appointment Orders clarified	
UBRAVRIBAI	Therapy of Advanced Breast Cancer using Ribociclib and Aromatase Inhibitor with or without LHRH Agonist	Eligibility updated		
BRAVTCAP	Palliative Therapy for Metastatic Breast Cancer using Trastuzumab and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
CN Neuro-Or	cology			
CNAJ12TZRT	Concomitant (Dual Modality) and 12 Cycles of Adjuvant Temozolomide for Newly Diagnosed Astrocytomas and Oligodendrogliomas with Radiation	Dose rounding link updated	Pre-chemotherapy metrics updated; dose rounding link updated	
CNAJTZRT	Concomitant (Dual Modality) and Adjuvant Temozolomide for Newly Diagnosed Malignant Gliomas with Radiation	Dose rounding link updated	Dose rounding link updated	
CNELTZRT	Treatment of Elderly Newly Diagnosed Glioma Patient with Concurrent and Adjuvant Temozolomide and Radiation Therapy	Dose rounding link updated	Dose rounding link updated	
CNTEM60	Therapy for Newly Diagnosed Malignant Brain Tumours with MGMT Methylation in Elderly Patients using Temozolomide	Dose rounding link updated	Dose rounding link updated	
CNTEMOZ	Therapy for Malignant Brain Tumours using Temozolomide	Dose rounding link updated	ANC updated; dose rounding link updated	
CNTEMOZMD	Therapy for Malignant Brain Tumours using Metronomic Dosing of Temozolomide	Dose rounding link updated	ANC updated; dose rounding link updated	
CNTMZETO	Therapy for Recurrent Malignant Brain Tumours using Temozolomide and Etoposide	Dose rounding link updated	ANC updated; dose rounding link updated	
GI Gastrointe	estinal			
GIAJCAP	Adjuvant Therapy of Colon Cancer using Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	

Protocol Code	Protocol Title	Protocol	PPPO	Handout
GIAJCAPOX	Adjuvant Combination Chemotherapy for Stage III and Stage IIB Colon Cancer using Oxaliplatin and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIAVCAP	Palliative Therapy of Advanced Colorectal Cancer using Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIAVCAPB	Palliative Therapy of Metastatic Colorectal Cancer using Capecitabine and Bevacizumab	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIAVCRT	Combined Modality Therapy for Metastatic Rectal Carcinoma using Capecitabine and Radiation Therapy	Dose rounding link updated	Dose rounding link updated	
GIAVTZCAP	Palliative Therapy of Metastatic Neuroendocrine Cancer using Temozolomide and Capecitabine	Dose rounding links updated	Dose rounding links updated	
GIAVPANI	Palliative Third-Line Treatment of Metastatic Colorectal Cancer using Panitumumab		Treatment clarified	
GICAPIRI	Palliative Combination Chemotherapy for Metastatic Colorectal Cancer using Irinotecan and Capecitabine in Patients Unsuitable for GIFOLFIRI	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GICAPOX	Palliative Combination Chemotherapy for Metastatic Colorectal Cancer using Oxaliplatin and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GICART	Curative Combined Modality Therapy for Carcinoma of the Anal Canal using Mitomycin, Capecitabine and Radiation Therapy	Institution name revised; dose rounding link updated	Dose rounding link updated	
GICIRB	Palliative Combination Chemotherapy for Metastatic Colorectal Cancer using Irinotecan, Bevacizumab and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GICOXB	Palliative Combination Chemotherapy for Metastatic Colorectal Cancer using Oxaliplatin, Bevacizumab and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GICPART	Curative Combined Modality Therapy for Carcinoma of the Anal Canal using Cisplatin, Capecitabine and Radiation Therapy	Dose rounding link updated	Dose rounding link updated	
GIFFIRB	Palliative Combination Chemotherapy for Metastatic Colorectal Cancer using Irinotecan, Fluorouracil, Leucovorin and Bevacizumab	Bevacizumab administration revised	Bevacizumab administration revised	

Protocol Code	Protocol Title	Protocol	PPPO	Handout
UGIFFIRPAN	Palliative Combination Chemotherapy for Metastatic Colorectal Cancer using Irinotecan, Fluorouracil, Leucovorin and Panitumumab		Treatment clarified	
GIFFOXB	Palliative Combination Chemotherapy for Metastatic Colorectal Cancer using Oxaliplatin, Fluorouracil, Leucovorin and Bevacizumab	Bevacizumab administration revised	Bevacizumab administration revised	
UGIFFOXPAN	Palliative Combination Chemotherapy for Metastatic Colorectal Cancer using Oxaliplatin, Fluorouracil, Leucovorin and Panitumumab		Treatment clarified	
GIGAJCOX	Adjuvant Chemotherapy in Gastric Cancer Patients with D2 Resection (Node-Negative) or Ineligible for Adjuvant Chemoradiation using Oxaliplatin and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIGAJCPRT	Adjuvant Chemotherapy of Gastric Cancer patients with Completely Resected Gastric Cancer using Cisplatin and Capecitabine and Radiation Therapy	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIGAVCC	Palliative Therapy of Metastatic or Locally Advanced Anal Squamous Cell Carcinoma using Cisplatin and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIGAVCCT	Palliative Treatment of Metastatic or Locally Advanced Gastric, Gastroesophageal Junction, or Esophageal Adenocarcinoma using Cisplatin, Capecitabine and Trastuzumab	Eligibility updated; dose calculation table removed; dose rounding link updated	Premedications updated; prochlorperazine and metoclopramide removed; dose rounding link updated	
GIGAVCOX	Palliative Treatment of Metastatic or Locally Advanced Gastric, Gastroesophageal Junction or Esophageal Adenocarcinoma using Capecitabine and Oxaliplatin	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIGAVCOXT	Palliative Treatment of Metastatic or Locally Advanced Gastric, Gastroesophageal Junction or Esophageal Adenocarcinoma using Capecitabine, Oxaliplatin and Trastuzumab	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIGECC	Perioperative Treatment of Resectable Adenocarcinoma of the Stomach, Gastro- esophageal Junction or Lower ½ Esophagus using Epirubicin, Cisplatin and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
UGILEN	First-Line Therapy of Advanced Hepatocellular Carcinoma using Lenvatinib		Tests clarified	

Protocol Code	Protocol Title	Protocol	PPPO	Handout
GIPAJGCAP	Adjuvant Chemotherapy for Resected Pancreatic Adenocarcinoma using Capecitabine and Gemcitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIPAVCAP	Second-Line Treatment of Metastatic or Unresectable Pancreatic Adenocarcinoma using Capecitabine	Institution name revised; dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIRAJCOX	Adjuvant Combination Chemotherapy for Stage III Rectal Cancer using Oxaliplatin and Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	
GIRCAP	Adjuvant Therapy for Stage II and III Rectal Cancer Previously Treated with Preoperative Radiation Therapy using Capecitabine	Dose rounding link updated	Dose rounding link updated	
GIRCRT	Combined Modality Adjuvant Therapy for High-Risk Rectal Carcinoma using Capecitabine and Radiation Therapy	Dose rounding link updated	Dose rounding link updated	
GIRINFRT	Combined Modality Adjuvant Therapy for High-Risk Rectal Carcinoma using Capecitabine, Infusional Fluorouracil and Radiation Therapy	Dose rounding link updated	Dose rounding link updated	
GO Gynecolo	gic			
GOBEP	Therapy of Ovarian Germ Cell Cancer using Bleomycin, Etoposide and Cisplatin	Tests clarified; filter size updated	hCG tests clarified; filter size updated	
GOEP	Therapy of Dysgerminomatous Ovarian Germ Cell Cancer using Cisplatin and Etoposide	Tests clarified; filter size updated	Tests clarified; filter size updated	
GOTDEMACO	Therapy for High-Risk Gestational Trophoblastic Neoplasia (GTN) using Etoposide, Methotrexate, Leucovorin (Folinic Acid), Dactinomycin, Cyclophosphamide and Vincristine	Tests clarified; filter size updated	hCG tests clarified; filter size updated	
GOTDLRA	Therapy for Low-Risk Gestational Trophoblastic Cancer using Dactinomycin	hCG tests clarified	hCG tests clarified	
GOTDMR	Therapy for Moderate-Risk Gestational Trophoblastic Cancer using Dactinomycin and Methotrexate	hCG tests clarified	See Inpatient PPO	
GU Genitour	inary			
GUAVNIV	Treatment of Metastatic or Advanced Renal Cell Carcinoma using Nivolumab	Treatment funding algorithm removed; administration filter updated	Administration filter updated	

	rotocols, PPPOs and Patient Hand			
Protocol Code	Protocol Title	Protocol	PPPO	Handout
GUAVNIV4	Treatment of Metastatic or Advanced Renal Cell Carcinoma using 4-Weekly Nivolumab	Treatment funding algorithm removed; administration filter updated	Administration filter updated	
GUAXIT	Therapy for Metastatic Renal Cell Carcinoma using Axitinib	Treatment funding algorithm removed; dose range added		
GUBEP	Curative Therapy for Germ Cell Cancer using Bleomycin, Etoposide and Cisplatin	Tests clarified	hCG tests clarified	
GUCABO	Therapy for Metastatic Renal Cell Carcinoma using Cabozantinib	Treatment funding algorithm removed; auxiliary administration information removed		
GUEP	Etoposide-Cisplatin Protocol for Germ Cell Cancers	Tests clarified; filter size updated	Tests clarified; filter size updated	
GUPAZO	Palliative Therapy for Renal Cell Carcinoma Using Pazopanib	Treatment funding algorithm removed; auxiliary administration information removed		
GUSORAF	Palliative Therapy for Renal Cell Carcinoma using Sorafenib	Treatment funding algorithm removed		
GUSUNI	Palliative Therapy for Renal Cell Carcinoma using Sunitinib	Treatment funding algorithm removed		
GUTAXGEM	Palliative Therapy for Germ Cell Cancers using Paclitaxel and Gemcitabine	Tests clarified	hCG tests clarified	
GUTIP	Advanced Therapy for Relapsed Testicular Germ Cell Cancer using Paclitaxel, Ifosfamide and Cisplatin (TIP)	Tests clarified	See Inpatient PPO	
GUVEIP	Consolidation and Salvage Treatment for Germ Cell Cancer using Vinblastine, Cisplatin, Ifosfamide and Mesna	Tests clarified	See Inpatient PPO	
GUVIP2	Consolidation and Salvage Therapy for Nonseminoma using Etoposide, Cisplatin, Ifosfamide, Mesna	Tests clarified; filter size updated	See Inpatient PPO	
HN Head and	Neck			
HNAVCAP	Treatment of Recurrent or Metastatic Squamous Cell Cancer of the Head and Neck with Capecitabine	Dose calculation table removed; dose rounding link updated	Dose rounding link updated	

REVISED P	REVISED Protocols, PPPOs and Patient Handouts (revisions in respective columns)				
Protocol Code	Protocol Title	Protocol	PPPO	Handout	
HNNAVCAP	Treatment of Recurrent or Metastatic Nasopharyngeal Cancer with Capecitabine	Institution name revised; dose calculation table removed; dose rounding link updated	Dose rounding link updated		
LK Leukemia					
ULKGEMOZ	Treatment of Acute Myeloid Leukemia using Gemtuzumab Ozogamicin with Induction and Consolidation Chemotherapy	Treatment cycle clarified			
ULKMDSA	Therapy of Myelodysplastic Syndrome and Acute Myeloid Leukemia using Azacitidine	Eligibility, Premedications, TALLman lettering and bone marrow exam recommendation updated	Premedications and TALLman lettering updated		
LU Lung					
ULUAVOSIF	First-Line Treatment of Epidermal Growth Factor Receptor (EGFR) Mutation-Positive Advanced Non-Small Cell Lung Cancer (NSCLC) with Osimertinib	Eligibility clarified			
LY Lymphom	a				
LYABVD	Treatment of Hodgkin's Disease with Doxorubicin, Bleomycin, Vinblastine and Dacarbazine	Dose Modifications (hepatic) added; bilirubin units revised; filgrastim dosing revised; cardiac monitoring precaution added	Antiemetics revised; bilirubin units revised		
LYALEM	Treatment with Subcutaneous or Intravenous Alemtuzumab for Fludarabine-Refractory B-Chronic Lymphocytic Leukemia (B-CLL) or with Intravenous Alemtuzumab for Previously Untreated T-Prolymphocytic Leukemia (T-PLL)	Contact Physician added; Tests revised; Iamivudine duration revised	Option to order more than one cycle added; vital signs monitoring added		
LYASPMEDEX	Treatment of Refractory or Relapsing Extranodal Natural Killer or T-Cell Lymphoma using Pegaspargase, Methotrexate and Dexamethasone	Tests clarified; timing of methotrexate levels clarified; Dose Modifications (hepatic) added	See Inpatient PPO		
LYBRENTUX	Treatment of Hodgkin Lymphoma and Anaplastic Large Cell Lymphoma with Brentuximab Vedotin	Premedications revised	Added premedications if prior reaction to brentuximab vedotin		
LYBV	Consolidation Therapy Post-Autologous Stem Cell Transplant (ASCT) for Hodgkin Lymphoma using Brentuximab Vedotin	Premedications revised	Added premedications if prior reaction to brentuximab vedotin		

Protocol Code	Protocol Title	Protocol	PPPO	Handout
LYCHOP	Treatment of Lymphoma with Doxorubicin, Cyclophosphamide, Vincristine and Prednisone	Cardiac monitoring threshold, lamivudine duration and filgrastim dosing revised; Dose Modifications (hepatic) added	Prochlorperazine and metoclopramide removed	
LYCHOPR	Treatment of Lymphoma with Doxorubicin, Cyclophosphamide, Vincristine, Prednisone and Rituximab	Number of treatment cycles, cardiac monitoring threshold, lamivudine duration and filgrastim dosing revised; Dose Modifications (hepatic) added	Prochlorperazine and metoclopramide removed	
LYCHOPRMTX	Treatment of Burkitt's Lymphoma and Leukemia (ALL-L3) with Cyclophosphamide, Vincristine, Doxorubicin, Methotrexate, Leucovorin (CODOX-M) and Rituximab	Exclusion criteria revised; Tests clarified; timing of methotrexate levels clarified; Dose Modifications (hepatic) clarified	See Inpatient PPO	
LYCHPBV	Treatment of CD30-Positive Peripheral T-Cell Lymphoma (PTCL) with Doxorubicin, Cyclophosphamide, Prednisone (CHP) and Brentuximab Vedotin	Premedications revised	Premedications revised; administration order of doxorubicin and cyclophosphamide reversed; filgrastim reminder added	
LYCLLCVPR	Treatment of Relapsed Chronic Lymphocytic Leukemia using Cyclophosphamide, Vincristine, Prednisone and Rituximab (CVP-R	Lamivudine duration revised; Dose Modifications (hepatic) added		
LYCODOXMR	Treatment of Burkitt's Lymphoma and Leukemia (ALL-L3) with Cyclophosphamide, Vincristine, Doxorubicin, Methotrexate, Leucovorin (CODOX-M) and Rituximab	Tests revised; Dose Modifications (hepatic, IT cytarabine) clarified; bilirubin units revised; References updated	Tests revised; Tests and metrics for IT cytarabine updated	
LYCVP	Treatment of Advanced Indolent Lymphoma using Cyclophosphamide, Vincristine, Prednisone (CVP)	Lamivudine duration revised; Dose Modifications (hepatic) added		
LYCVPPABO	Treatment of Hodgkin's Disease with Cyclophosphamide, Vinblastine, Procarbazine, Prednisone, Doxorubicin, Vincristine and Bleomycin	Protocol title, lamivudine duration and cardiac monitoring revised; Dose Modifications (hepatic) added	Institution logo updated	
LYCVPR	Treatment of Advanced Indolent Lymphoma using Cyclophosphamide, Vincristine, Prednisone and Rituximab (CVP-R)	Lamivudine duration revised; Dose Modifications (hepatic) added		

Protocol Code	Protocol Title	Protocol	PPPO	Handout
LYGDP	Treatment of Lymphoma with Gemcitabine, Dexamethasone and Platinum	Eligibility revised; dose recommendation for elderly patients added	Antiemetics revised; Dose Modification (gemcitabine) added	
LYGDPR	Treatment of Lymphoma with Gemcitabine, Dexamethasone and Platinum with Rituximab	Eligibility revised; dose recommendation for elderly patients added	Antiemetics revised; Dose Modification (gemcitabine) added	
LYHDMRP	Treatment of Primary Intracerebral Lymphoma with High-Dose Methotrexate and Rituximab	Exclusion criteria revised; Tests clarified; timing of methotrexate levels clarified; Dose Modifications (hepatic) added	See Inpatient PPO	
LYHDMTXP	Treatment of Primary Intracerebral Lymphoma with High-Dose Methotrexate	Exclusion criteria revised; Tests clarified; timing of methotrexate levels clarified; Dose Modifications (hepatic) added	See Inpatient PPO	
LYHDMTXR	Treatment of Secondary CNS Lymphoma or Recurrent Intracerebral Lymphoma with High-Dose Methotrexate	Exclusion criteria revised; Tests clarified; timing of methotrexate levels clarified; Dose Modifications (hepatic) added	See Inpatient PPO	
LYIT	Treatment of Lymphoma using Intrathecal Methotrexate and Cytarabine	Eligibility, Tests, dosing options and Dose Modifications revised; References added	Tests and Return Appointment Orders revised; single dose option added	
LYIVACR	Treatment of Burkitt Lymphoma and Leukemia (ALL-L3) with Ifosfamide, Mesna, Etoposide, Cytarabine (IVAC) and Rituximab	Tests and metrics for IT methotrexate updated	Tests and metrics for IT methotrexate updated	
LYRICE	Treatment of Relapsed or Refractory Advanced Stage Aggressive B-Cell Non- Hodgkin's Lymphoma with Ifosfamide, Carboplatin, Etoposide and Rituximab	Lamivudine duration revised; urine dipstick for hematuria clarified; diluent for ifosfamide and mesna revised; dose recommendations for elderly patients added	Home urine dipstick removed; diluent for ifosfamide and mesna revised; dose modifications added	
LYSMILE	Treatment of Natural Killer or T-Cell Lymphoma using Dexamethasone, Methotrexate, Ifosfamide, Pegaspargase and Etoposide	Exclusion criteria revised; Tests clarified; timing of methotrexate levels clarified; Dose Modifications (hepatic) clarified	See Inpatient PPO	
MY Myeloma				
UMYBLDF	Treatment of Previously Untreated Multiple Myeloma and Not Eligible for Stem Cell Transplant using Bortezomib, Lenalidomide and Dexamethasone	Steroid dosing revised	Steroid dosing revised	

REVISED Protocols, PPPOs and Patient Handouts (revisions in respective columns)				
Protocol Code	Protocol Title	Protocol	PPPO	Handout
MYBORPRE	Treatment of Multiple Myeloma using Bortezomib, Dexamethasone with or without Cyclophosphamide as Induction Pre-Stem Cell Transplant	Dose Modifications (renal) clarified; References updated		
MYBORREL	Treatment of Relapsed Multiple Myeloma using Bortezomib, Dexamethasone with or without Cyclophosphamide	Dose Modifications (renal) clarified; References updated		
UMYCARDEX	Therapy of Multiple Myeloma using Carfilzomib and Dexamethasone with or without Cyclophosphamide	Steroid dosing updated; Dose Modifications (renal) clarified; References updated	Steroid dosing updated	
UMYCARLD	Therapy of Multiple Myeloma using Carfilzomib, Lenalidomide with Dexamethasone	Steroid dosing updated; lamivudine duration revised	Steroid dosing updated	
UMYDARBD	Treatment of Relapsed and Refractory Multiple Myeloma with Daratumumab in Combination with Bortezomib and Dexamethasone with or without Cyclophosphamide	Premedications, steroid dosing, Dose Modifications (renal) and Precautions updated	Premedications and steroid dosing updated (both PPPOs)	
UMYDARLD	Treatment of Relapsed and Refractory Multiple Myeloma with Daratumumab in Combination with Lenalidomide and Dexamethasone	Premedications, steroid dosing and Precautions updated	Premedications and steroid dosing updated (both PPPOs)	
UMYLDF	Treatment of Previously Untreated Multiple Myeloma and Not Eligible for Stem Cell Transplant using Lenalidomide with Low-Dose Dexamethasone	Steroid dosing updated; lamivudine duration revised	Steroid dosing updated	
UMYLDREL	Therapy of Relapsed Multiple Myeloma using Lenalidomide with Dexamethasone	Steroid dosing updated	Steroid dosing updated	
MYMPBOR	Treatment of Multiple Myeloma using Melphalan, Prednisone and Weekly Bortezomib with the Option of Substituting Cyclophosphamide for Melphalan	Dose Modifications (renal) clarified; References updated		
UMYPOMDEX	Therapy of Multiple Myeloma using Pomalidomide with Dexamethasone	Steroid dosing updated	Steroid dosing updated	
SA Sarcoma				
SATEMBEV	Therapy for Advanced Solitary Fibrous Tumours and Hemangiopericytoma using Temozolomide and Bevacizumab	Dose rounding link updated; bevacizumab administration updated	Dose rounding link updated; bevacizumab administration updated	

REVISED Protocols, PPPOs and Patient Handouts (revisions in respective columns)						
Protocol Code	Protocol Title	Protocol	PPPO	Handout		
SM Skin and	SM Skin and Melanoma					
USMAVCEM	Treatment of Locally Advanced or Metastatic Cutaneous Squamous Cell Carcinoma using Cemiplimab	Dosing revised; References added	Dosing revised			
SMAVTMZ	Palliative Therapy for Malignant Melanoma with Brain Metastases using Temozolomide	Dose rounding link updated	Dose rounding link updated			

Resources and Contact Information			
Resource	Phone	Email / Toll Free / Fax	
Systemic Therapy Update: www.bccancer.bc.ca/health-professionals/clinical-resources/systemic-therapy/systemic-therapy-update			
Systemic Therapy Update Editor	604-877-6000 x 672649	bulletin@bccancer.bc.ca	
Oncology Drug Information Cancer Drug Manual Editor Pharmacy Oncology Certification Nurse Educators	604-877-6275 250-519-5500 x 693742 250-712-3900 x 686820 604-877-6000 x 672638	druginfo@bccancer.bc.ca nbadry@bccancer.bc.ca rxchemocert@bccancer.bc.ca nursinged@bccancer.bc.ca	
CAP – Compassionate Access Program	604-877-6277	cap_bcca@bccancer.bc.ca fax 604-708-2026	
OSCAR – Online System for Cancer Drugs Adjudication and Reimbursement	888-355-0355	oscar@bccancer.bc.ca fax 604-708-2051	
Manufacturer Patient Assistance Programs:	lanufacturer Patient Assistance Programs: http://www.bccancer.bc.ca/mpap		
Library/Cancer Information	604-675-8003	toll free 888-675-8001 x 8003 requests@bccancer.bc.ca	
Library Document Delivery	604-675-8002	requests@bccancer.bc.ca	
Pharmacy Professional Practice Professional Practice, Nursing Provincial Systemic Therapy Program	604-877-6000 x 672247 604-877-6000 x 672623 604-877-6000 x 672247	mlin@bccancer.bc.ca BCCancerPPNAdmin@ehcnet.phsa.ca mlin@bccancer.bc.ca	
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