

BC Cancer Protocol for Primary Treatment of Squamous, Adenocarcinoma, or Adenosquamous Cancer of the Cervix with Bevacizumab, CARBOplatin, PACLitaxel and Pembrolizumab

Protocol Code

UGOCXCATBP

Tumour Group

Gynecology

Contact Physician

GO Systemic Therapy

ELIGIBILITY:

Patients must have:

- Squamous, adenocarcinoma, or adenosquamous carcinoma of the cervix,
- Persistent, recurrent, or metastatic disease,
- PD-L1 expression with combined positive score (CPS) greater than or equal to 1,
- No amenability to curative-intent treatment,
- No prior chemotherapy in the advanced setting (except chemotherapy as part of combined modality therapy with curative intent), and
- BC Cancer Compassionate Access Program (CAP) approval.

Patients should have:

- ECOG 0 to 2,
- Adequate baseline hematological, hepatic and renal function, and
- Access to a treatment centre with expertise in managing immunotherapy mediated toxicities of pembrolizumab.

Notes:

- At time of subsequent disease progression, retreatment with GOCXCATBP is allowed for an additional 18 cycles of pembrolizumab for 3-weekly dosing or 9 cycles for 6-weekly dosing (or a combination of both) including doses given as GOCXBP and GOCXBP6:
 - Retreatment without CAP approval is allowed if patient has completed the initial pembrolizumab treatment without disease progression.
- Patients on active treatment with GOCXCATB and do not have proven progression may switch to GOCXCATBP if all other eligibility criteria are met
- **Patients previously treated with GOCXPEMCR are eligible provided progression occurred more than 6 months after treatment completion**

EXCLUSIONS:

Patients must not have:

- Unstable or symptomatic central nervous system metastases,
- Any small cell component,
- Neutrophils less than $1.0 \times 10^9/L$,
- Initiation of single-agent pembrolizumab or bevacizumab monotherapy without chemotherapy,
- Cancer of the vagina or vulva,
- Major surgery within 4 weeks,
- Uncontrolled hypertension,
- Prior bevacizumab, or
- Bleeding diathesis.

CAUTIONS:

- Active, known, or suspected autoimmune disease
- Patients with long term immunosuppressive therapy or systemic corticosteroids (requiring more than 10 mg predniSONE/day or equivalent)
- Pre-existing motor or sensory neuropathy greater than Grade 2
- Uncontrolled arterial or venous thromboembolism
- MI or CVA within 4 months
- Avoid NSAIDS and ASA if possible

TESTS:

- Baseline: CBC & Diff, creatinine, ALT, total bilirubin, alkaline phosphatase, sodium, potassium, TSH, random glucose, dipstick or laboratory urinalysis for protein, blood pressure (BP) measurement, morning serum cortisol, chest x-ray or CT chest if not previously done
- Baseline, if clinically indicated: CA 125, CA 15-3, CA 19-9, CEA, SCC, magnesium, calcium, BNP, creatine kinase, troponin, ECG, echocardiogram
- Prior to each treatment: CBC & Diff, creatinine, ALT, alkaline phosphatase, total bilirubin, sodium, potassium, TSH, dipstick or laboratory urinalysis for protein, blood pressure measurement
- 24-hour urine for protein if occurrence of proteinuria (dipstick urinalysis shows 2+ or 3+ or laboratory urinalysis for protein is greater than or equal to 1 g/L)
- Blood pressure measurement to be taken pre- and post-dose in first three cycles, and then pre-dose only in subsequent cycles
- If clinically indicated: GGT, morning serum cortisol, lipase, random glucose, LDH, creatine kinase, serum or urine HCG (required for women of childbearing potential if pregnancy suspected), free T3 and free T4, serum ACTH levels, testosterone, estradiol, FSH, LH, magnesium, calcium, troponin, CA 125, CA 15-3, CA 19-9, CEA, SCC, ECG, chest x-ray
- Weekly telephone nursing assessment for signs and symptoms of side effects while on treatment (optional).

PREMEDICATIONS:

- **If no prior infusion reactions to pembrolizumab:** administer premedications as sequenced below
45 minutes prior to PACLitaxel:
 - dexamethasone 20 mg IV in 50 mL NS over 15 minutes30 minutes prior to PACLitaxel:
 - diphenhydrAMINE 50 mg IV in 50 mL NS over 15 minutes and famotidine 20 mg IV in 100 mL NS over 15 minutes (Y-site compatible)
- **If prior infusion reactions to pembrolizumab:** administer PACLitaxel premedications prior to pembrolizumab
45 minutes prior to pembrolizumab:
 - dexamethasone 20 mg IV in 50 mL NS over 15 minutes30 minutes prior to pembrolizumab:
 - diphenhydrAMINE 50 mg IV in 50 mL NS over 15 minutes and famotidine 20 mg IV in 100 mL NS over 15 minutes (Y-site compatible)acetaminophen 325 to 975 mg PO prior to pembrolizumab
- Antiemetic protocol for highly emetogenic chemotherapy ([see SCNAUSEA](#))

TREATMENT:

Drug	Starting Dose	BC Cancer Administration Guideline
pembrolizumab	2 mg/kg* (maximum 200 mg)	IV in 50 mL NS over 30 minutes using a 0.2 micron in-line filter**
PACLitaxel	175 mg/m ²	IV in 250 to 500 mL NS over 3 hours (use non-DEHP bag and non-DEHP tubing with 0.2 micron in-line filter*)
CARBOplatin	Dose = AUC 5 x (GFR + 25)	IV in 100 to 250 mL NS over 30 minutes
bevacizumab	15 mg/kg***	IV in 100 to 250 mL NS over 30 minutes [‡]

* Select dose per Dose Banding Table (appendix)

** Use a separate infusion line and filter for each drug.

*** bevacizumab dose does not need to be recalculated after Cycle 1 even if weight changes. Select dose per Dose Banding Table (appendix).

[‡]Observe for fever, chills, rash, pruritus, urticaria, or angioedema and stop infusion and contact the physician if any of these occur. Infusion reactions should be treated according to severity. If the bevacizumab infusion is restarted then it should be given at an initial rate to complete after 60 minutes or longer.

If acute hypertension (increase in BP measurement of greater than 20 mmHg diastolic or greater than 150/100 if previously within normal limits) occurs during bevacizumab infusion – stop treatment. Resume at half the original rate of infusion if blood pressure has returned to pretreatment range within one hour. If blood pressure does not return to pretreatment range within one hour – hold bevacizumab; subsequent infusions of bevacizumab should be given over 3 hours. Acute hypertension that is symptomatic (e.g., onset of headaches or change in level of consciousness) or BP measurement of greater than 180/110 that does not improve within one hour of stopping bevacizumab is an urgent situation that requires treatment.

Measured GFR (e.g. nuclear renogram) is preferred whenever feasible, particularly in circumstances of co-morbidity that could affect renal function (third-space fluid accumulations, hypoproteinemia, potentially inadequate fluid intake, etc.). The lab reported GFR (MDRD formula) may be used as an alternative to the Cockcroft-Gault estimate of GFR; the estimated GFR reported by the lab or calculated using the Cockcroft-Gault equation should be capped at 125 mL/min when it is used to calculate the initial CARBOplatin dose. When a nuclear renogram is available, this clearance would take precedence.

Cockcroft-Gault Formula

$$\text{GFR} = \frac{1.04 \times (140 - \text{age in years}) \times \text{wt (kg)}}{\text{serum creatinine (micromol/L)}}$$

Note: The same method of estimation should be used throughout the treatment course (i.e. if lab reported GFR was used initially, this should be used for dosing in all subsequent cycles and not the Cockcroft-Gault estimate).

- Each cycle is 21 days (3 weeks).
- Chemotherapy treatment: usual duration of chemotherapy is 6 cycles. Patients with ongoing benefit may continue beyond 6 cycles per discretion of treating physician
- Pembrolizumab duration:
 - Initial pembrolizumab treatment: maximum of 35 cycles for 3-weekly dosing or 18 cycles for 6-weekly dosing (or a combination of both) or 2 years of treatment, including doses given as GOCXBP and GOCXBP6. Patients may have treatment breaks for reasons other than progression (e.g., toxicities, treatment holiday, vacation).
 - Retreatment may be permitted (see Eligibility).
- If patients are intolerant of the chemotherapy after at least 1 cycle, pembrolizumab with or without bevacizumab can be continued as above
- Bevacizumab treatment: to progression or intolerance
- For continuation of treatment with maintenance pembrolizumab with or without bevacizumab without chemotherapy, see protocol GOCXBP or GOCXBP6.

DOSE MODIFICATIONS:

1. Hematology

ANC (x 10 ⁹ /L)		Platelets (x 10 ⁹ /L)	Doses (PACLitaxel and CARBOplatin)
Greater than or equal to 1.0	and	Greater than or equal to 100	Proceed at same doses
Less than 1.0	or	Less than 100	Delay until recovery

Febrile Neutropenia

ANC (x 10 ⁹ /L)		Platelets (x 10 ⁹ /L)	PACLitaxel Dose	CARBOplatin Dose
Febrile neutropenia at any time	and	any	Delay until recovery, then reduce subsequent doses to 80%	Delay until recovery, then reduce subsequent doses to 80%

- 2. Other Toxicities:** No specific dose modifications for pembrolizumab. Toxicity managed by treatment delay and other measures (see SCIMMUNE protocol for management of immune-mediated adverse reactions to checkpoint inhibitors immunotherapy).

3. Proteinuria:

There are 3 different measures of proteinuria that may be used to assess the need for modification of bevacizumab therapy – urine dipstick analysis (measured in + values), laboratory urinalysis for protein (measured in g/L) and 24-hour urine collections for protein (measured in g/24 hours)

Urine dipstick analysis or laboratory urinalysis for protein should be performed at baseline and then prior to each cycle:

Degree of Proteinuria	Bevacizumab Dose
Neg or 1+ dipstick or less than 1 g/L laboratory urinalysis for protein	Administer bevacizumab dose as scheduled
2+ or 3+ dipstick or greater than or equal to 1 g/L laboratory urinalysis for protein	Administer bevacizumab dose as scheduled. Collect 24-hour urine for determination of total protein within 3 days before the next scheduled bevacizumab administration. Adjust bevacizumab treatment based on the table below.
If urine dipstick shows 4+ at baseline or during treatment	Withhold bevacizumab and proceed with 24 hour urine collection

24-Hour Urine Total Protein (g/24 hours)	Bevacizumab Dose
Less than or equal to 2	100%
Greater than 2 to 4	Hold dose and recheck 24-hour urine every 2 weeks. When less than or equal to 2 g/24 hour, resume therapy at 10 mg/kg
Greater than 4	Withhold/Discontinue bevacizumab

4. Hypertension:

Blood Pressure (mmHg)	Bevacizumab Dose
Less than or equal to 150/100	100%
Greater than 150/100 asymptomatic	100% Notify physician and start or adjust antihypertensive therapy***
Hypertensive crisis	Discontinue therapy

- Antihypertensive therapy may include hydroCHLOROthiazide 12.5 to 25 mg PO once daily, ramipril (ALTACE) 2.5 to 5 mg PO once daily, or amLODIPine (NORVASC) 5 to 10 mg PO once daily.

***** Any patients presenting with chest pain, significant leg swelling, shortness of breath, new severe headaches or new neurologic symptoms, must be re-assessed by a physician before receiving further bevacizumab infusions.**

- 5. Arthralgia and/or myalgia:** If arthralgia and/or myalgia from PACLitaxel of Grade 2 (moderate) or higher is not relieved by adequate doses of NSAIDs or acetaminophen with codeine (e.g., Tylenol #3), a limited number of studies report a possible therapeutic benefit using:
 - predniSONE 10 mg PO BID for 5 days starting 24 hours post-PACLitaxel
 - gabapentin 300 mg PO on day before chemotherapy, 300 mg BID on treatment day, then 300 mg TID for 7 to 10 days
 - If arthralgia and/or myalgia persists, reduce subsequent PACLitaxel doses to 135 mg/m².
- 6. Neuropathy:** Dose modification or discontinuation may be required (see BC Cancer Drug Manual).
- 7. Renal dysfunction:** If significant increase (greater than 20%) in creatinine, recalculate CARBOplatin dose using new GFR.
- 8. Hepatic dysfunction:** Dose reduction may be required for PACLitaxel (see BC Cancer Drug Manual)

PRECAUTIONS:

1. **Serious immune-mediated reactions to pembrolizumab:** these can be severe to fatal and usually occur during the treatment course. They may include enterocolitis, intestinal perforation or hemorrhage, hepatitis, dermatitis, neuropathy, endocrinopathy, as well as toxicities in other organ systems. Early diagnosis and appropriate management are essential to minimize life-threatening complications (see **SCIMMUNE** protocol for management of immune-mediated adverse reactions to checkpoint inhibitors immunotherapy).
2. **Infusion-related reactions:** isolated cases of severe reaction have been reported. In case of a severe reaction, pembrolizumab infusion should be discontinued and appropriate medical therapy administered. Patients with mild or moderate infusion reaction may receive pembrolizumab with close monitoring. Premedications with acetaminophen and anti-histamine may be considered if there is a history of reaction.
3. **Hypersensitivity:** Reactions are common with PACLitaxel. See BC Cancer Hypersensitivity Guidelines

<i>mild</i> symptoms (e.g. mild flushing, rash, pruritus)	<ul style="list-style-type: none"> • complete PACLitaxel infusion. Supervise at bedside • no treatment required
<i>moderate</i> symptoms (e.g. moderate rash, flushing, mild dyspnea, chest discomfort, mild hypotension)	<ul style="list-style-type: none"> • stop PACLitaxel infusion • give IV diphenhydrAMINE 25 to 50 mg and IV hydrocortisone IV 100 mg • after recovery of symptoms resume PACLitaxel infusion at 20 mL/h for 5 minutes, 30 mL/h for 5 minutes, 40 mL/h for 5 minutes, then 60 mL/h for 5 minutes. If no reaction, increase to full rate. • if reaction recurs, discontinue PACLitaxel therapy
<i>severe</i> symptoms (i.e. <i>one</i> or more of respiratory distress requiring treatment, generalized urticaria, angioedema, hypotension requiring therapy)	<ul style="list-style-type: none"> • stop PACLitaxel infusion • give IV antihistamine and steroid as above. Add epinephrine or bronchodilators if indicated • discontinue PACLitaxel therapy

4. **Extravasation:** PACLitaxel causes pain and may, rarely, cause tissue necrosis if extravasated. Refer to BC Cancer Extravasation Guidelines.
5. **Neutropenia:** Fever or other evidence of infection must be assessed promptly and treated aggressively.
6. **Gastrointestinal perforations and wound dehiscence:** Can be fatal. Typical presentation is reported as abdominal pain. Bevacizumab should be discontinued in patients with gastrointestinal perforation or wound dehiscence.
7. **Hemorrhage:** Bevacizumab has been associated with hemorrhage. Cases of CNS hemorrhage, some with fatal outcome, have been observed. Patients should be

monitored for signs and symptoms of CNS bleeding. If Grade 3/4 hemorrhage occurs, discontinue bevacizumab. Patients with significant bleeding diatheses should not receive bevacizumab. Platelet inhibitory medications such as NSAIDS (including ASA at doses greater than 325 mg/day) should be discontinued prior to institution of bevacizumab. COX-2 inhibitors are permissible.

- 8. Thrombosis:** A history of arterial thromboembolic events or age greater than 65 years is associated with an increased risk of arterial thromboembolic events with bevacizumab. If Grade 3 thromboembolic event or incidentally discovered pulmonary embolus arises, hold bevacizumab for 2 weeks, then consider resumption of bevacizumab if risks of tumour-related hemorrhage are judged low AND the patient is on a stable dose of anticoagulant. If a second Grade 3 thrombosis occurs, or if a Grade 4 thrombosis occurs, discontinue bevacizumab. Patients on warfarin should have INR checked frequently, at least once every 2-3 weeks, while receiving bevacizumab.
- 9. Proteinuria:** Has been seen in all clinical trials with bevacizumab to date and is likely dose-dependent. If proteinuria of greater than or equal to 2 g/24 h persists for more than 3 months, consider further investigations - possibly a renal biopsy.
- 10. Hypertension:** Has been seen in all clinical trials with bevacizumab to date and is likely dose-dependent. The most commonly used therapies are calcium channel blockers, ACE inhibitors and diuretics. Blood pressure should be monitored through routine vital signs evaluations. If hypertension is poorly controlled with adequate medication, discontinue bevacizumab.
- 11. Reversible Posterior Leukoencephalopathy Syndrome (RPLS):** Rarely, patients being treated with bevacizumab may develop seizures, headache, altered mental status, visual disturbances, with or without associated hypertension consistent with RPLS. May be reversible if recognized and treated promptly.
- 12. Congestive Heart Failure:** Has been reported in up to 3.5% of patients treated with bevacizumab. Most patients showed improvement in symptoms and/or LVEF following appropriate medical therapy.

Contact the GO Systemic Therapy physician at your regional cancer centre or GO Systemic Therapy Chair with any problems or questions regarding this treatment program.

References:

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3. Tewari KS, et al. Improved survival with bevacizumab in advanced cervical cancer. *N Engl J Med* 2014;370:734-43.
4. Benedetti Panici P, Bellati F, Plotti F, et al. Neoadjuvant chemotherapy followed by radical surgery in patients affected by vaginal carcinoma. *Gynecol Oncol*. 2008;111(2):307-311.
5. Klavans MR, Erickson SH, Modesitt SC. Neoadjuvant chemotherapy with paclitaxel/carboplatin/bevacizumab in advanced vulvar cancer: Time to rethink standard of care? *Gynecol Oncol Rep*. 2020; 34:100631.
6. Egger EK, Ralser DJ, Lindner K, et al. Diagnostic and Therapeutic Approach in a Metastatic Vaginal Adenocarcinoma: A Case Report. *Front Immunol*. 2021;12:686879. Published 2021 Jul 23. doi:10.3389/fimmu.2021.686879
7. Raspagliesi F, Zanaboni F, Martinelli F, Scasso S, Laufer J, Ditto A. Role of paclitaxel and cisplatin as the neoadjuvant treatment for locally advanced squamous cell carcinoma of the vulva. *J Gynecol Oncol*. 2014;25(1):22-29.
8. Colombo N, Dubot C, Lorusso D, et al; KEYNOTE-826 Investigators. Pembrolizumab for Persistent, Recurrent, or Metastatic Cervical Cancer. *N Engl J Med*. 2021 Nov 11;385(20):1856-1867.

Appendix. Dose Bands

PEMBROLIZUMAB DOSE BANDING TABLE (2 mg/kg capped 200 mg)

Ordered Dose (mg)		Rounded dose (mg)
From:	To:	
Less than 70		Pharmacy prepares specific dose
70	80.49	75
80.5	92.49	85
92.5	110.49	100
110.5	137.49	125
137.5	162.49	150
162.5	187.49	175
187.5	200	200

BEVACIZUMAB DOSE BANDING TABLE

Ordered Dose (mg)		Rounded dose (mg)
From:	To:	
Less than 188		Pharmacy prepares specific dose
188	221.49	200
221.5	236.49	225
236.5	260.49	250
260.5	286.49	275
286.5	332.49	300
332.5	387.49	350
387.5	443.49	400
443.5	474.49	450
474.5	554.49	500
554.5	665.49	600
665.5	776.49	700
776.5	887.49	800
887.5	999.49	900
999.5	1099.49	1000
1099.5	1199.49	1100
1199.5	1299.49	1200
1299.5	1399.49	1300
1399.5	1499.49	1400
1499.5	1599.49	1500
1599.5	1699.49	1600
1699.5	1799.49	1700
1799.5	1899.49	1800
1899.5	1999.49	1900
1999.5	2099.49	2000
2099.5	2199.49	2100
2199.5	2299.49	2200
2299.5	2399.49	2300
More than 2399.49		Pharmacy prepares specific dose