

## For the Patient: **LUAVPPMB**

Other Names: Treatment of Advanced Non-Squamous Non-Small Cell Lung Cancer with Platinum, Pemetrexed, and Pembrolizumab

**LU** = **LU**ng  
**AV** = **AdV**anced  
**P** = **CisP**latin  
**P** = **P**emetrexed  
**PMB** = **PeMB**rolizumab

### **ABOUT THIS MEDICATION**

#### **What are these drugs used for?**

**LUAVPPMB** is an intravenous (through the vein) drug treatment for advanced non-small cell cancer with non-squamous cell type.

This treatment is offered to people who have good kidney function and a good performance status. Performance status is a measure of how well a person is able to perform their usual daily activities.

#### **How do these drugs work?**

There are three drugs in this treatment:

- Pembrolizumab is a type of therapy called immunotherapy. It is an antibody designed to help your own body's immune system target cancer cells to stop them from growing.
- Pemetrexed is an anticancer drug that belongs to a group of drugs called antimetabolites. It works by interrupting the synthesis of DNA that is needed for cancer cells to multiply and divide.
- Cisplatin is an anticancer drug that belongs to a group of drugs called platinum. It works by preventing the synthesis of DNA, RNA and proteins that are needed for cancer cells to divide.

### **INTENDED BENEFITS**

This treatment is being given to destroy and/or to slow down the growth of cancer cells in your body. This treatment can help with controlling some of the symptoms the cancer may be causing and may delay or prevent new symptoms from starting.

### **TREATMENT SUMMARY**

#### **Before your treatment begins:**

The table below outlines the medications you need to take before your treatment begins:

- You must take both folic acid and vitamin B12 before starting treatment to help protect your healthy cells from pemetrexed.

MEDICATION	WHERE TO GET IT	HOW TO TAKE IT
<b>Folic Acid</b> 0.4 mg tablets	At your regular pharmacy, without a prescription	Take one tablet (0.4 mg) <b>once daily</b> . Start <i>one week</i> before your first treatment and stop <i>three weeks</i> after your last treatment.
<b>Vitamin B12</b> 1000 mcg injection	At your regular pharmacy, behind the pharmacy counter, without a prescription	<b>Your doctor or nurse will inject this into your muscle once every 9 weeks</b> . Start <i>one week</i> before first treatment and stop <i>three weeks</i> after your last treatment.

- You must also take drug(s) to prevent nausea and vomiting. Some commonly used drugs include [dexamethasone](#), ondansetron, aprepitant, or netupitant-palonosetron. Your oncologist will select the most suitable choice(s) for you. You may get it from your regular pharmacy with a doctor's prescription.

#### How are these drugs given?

- Your treatment plan consists of 4 cycles. Each cycle lasts 3 weeks (21 days).
- For each cycle, you will have the three drugs given to you intravenously (through the vein) on Day 1.
  - Pembrolizumab is given first. The infusion lasts about 30 minutes.
  - Pemetrexed is given next. The infusion lasts about 10 minutes.
  - You will then be given extra fluids intravenously for one hour (60 minutes) before cisplatin. This helps prevent kidney problems.
  - Cisplatin is given last. The infusion lasts about one hour (60 minutes).

### What will happen while I am being treated?

- A blood test is done within one month of starting treatment.
- A blood test is also done before Day 1 of each cycle.
- For the first two cycles of treatment, an additional blood test will be done once a week.
- The dose and timing of your treatment may be changed based on your blood test results and/or other side effects.
- Your very first treatment will take longer than other treatments because a nurse will be reviewing the possible side effects of your treatment plan and will discuss with you how to manage them. *It is a good idea to bring someone with you to your first treatment appointment.*
- Please bring your anti-nausea drugs with you for each treatment. Your nurse will tell you when to take them. You may also need to take anti-nausea drugs at home after treatment. It is easier to prevent nausea and vomiting than to treat it once it happens, so follow directions closely.

### LUAVPPMB TREATMENT PROTOCOL

**Start Date:** \_\_\_\_\_

#### **Cycle 1: Blood test before Day 1**

<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>	<b>Day 4</b>	<b>Day 5</b>	<b>Day 6</b>	<b>Day 7</b>
Pembrolizumab Pemetrexed Hydration Cisplatin	No treatment	No treatment	No treatment	No treatment	No treatment	No treatment
<b>Day 8</b>	<b>Day 9</b>	<b>Day 10</b>	<b>Day 11</b>	<b>Day 12</b>	<b>Day 13</b>	<b>Day 14</b>
<b>Blood test</b> No treatment	No treatment	No treatment	No treatment	No treatment	No treatment	No treatment
<b>Day 15</b>	<b>Day 16</b>	<b>Day 17</b>	<b>Day 18</b>	<b>Day 19</b>	<b>Day 20</b>	<b>Day 21</b>
<b>Blood test</b> No treatment	No treatment	No treatment	No treatment	No treatment	No treatment	No treatment

**This 21-day cycle will occur for a total of 4 times.**

**(Day 8 and Day 15 blood tests may not be required after Cycle 2 – this will be decided by your oncologist)**

## **OTHER INSTRUCTIONS**

***It is very important to report side effects immediately to your doctor. Do not manage side effects at home without first speaking with your doctor. Be aware that symptoms may be delayed and can develop months after your last dose.***

### **What other drugs or foods can interact with LUAVPPMB?**

- Other drugs may interact with this treatment. Check with your doctor or pharmacist before you start or stop taking any other drugs including all prescription and non-prescription medicines, steroids or other medicines that lower your immune response, vitamins, and herbal supplements.
- The drinking of alcohol (in small amounts) does not appear to affect the safety or usefulness of this treatment.

### **Other important things to know:**

- **Before you are given pembrolizumab**, talk to your doctor or pharmacist if you:
  - have an active condition where your immune system attacks your body (autoimmune disease), such as ulcerative colitis, Crohn's disease, lupus, rheumatoid arthritis or sarcoidosis.
  - take other medicines that make your immune system weak. Examples of these may include steroids, such as prednisone or dexamethasone.
  - had an organ transplant, such as a kidney transplant.
  - have any other medical conditions.
- Cisplatin can cause changes in kidney function, but this is not frequent with the doses used in this treatment. To prevent this problem, it is important that you are well-hydrated before and after treatment.
- Sometimes the nerve which allows you to hear can be affected by cisplatin. This could result in you experiencing "tinnitus" (ringing in the ears) or a change in your hearing. Report any of these problems to your doctor and/or nurse.
- This treatment may cause sterility in men and menopause in women. If you plan to have children, discuss this with your oncologist before starting treatment.
- This treatment may damage sperm and may cause harm to the baby if used during pregnancy. It is best to use birth control while you are undergoing treatment and for **4 months** after the last dose. Tell your doctor right away if you or your partner becomes pregnant. Do not breast feed during treatment.
- Tell all doctors including dentists you see that you are being treated with pembrolizumab, pemetrexed, and cisplatin before you receive treatment of any form.

## **SIDE EFFECTS AND WHAT TO DO ABOUT THEM**

### **Are there any risks?**

Unexpected and unlikely side effects can occur with any drug treatment. The ones listed below are particularly important for you to be aware of as they are directly related to the common actions of the drug in your treatment plan.

### **What is the most important information I should know about SERIOUS SIDE EFFECTS?**

- **Pembrolizumab may cause serious immune reactions against your own body (autoimmune) affecting many parts.**
- The following side effects were most frequently reported:
  - diarrhea
  - itching, rash
  - joint pain
  - feeling tired
  - feeling less hungry
  - cough
- These side effects are most likely to begin during treatment; however, side effects can show up months after your last treatment with pembrolizumab.
- **Tell** your doctor as soon as possible if you have any of serious side effects listed in the table below or your symptoms get worse.
- **Do not try to treat or diagnose symptoms yourself.** Getting medical treatment right away may keep the problem from becoming more serious.

## Serious Side Effects Associated with Pembrolizumab

SERIOUS SIDE EFFECTS	How common is it?
<p><b>Inflammation of the intestines (colitis)</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• diarrhea (loose stools) or more bowel movements than usual. <b>Do not treat the diarrhea yourself.</b></li> <li>• blood or mucus in stools or dark, tarry, sticky stools</li> <li>• severe stomach pain (abdominal pain) or tenderness</li> </ul>	<p>Common             (less than 1 in 10 but more than 1 in 100)</p>
<p><b>Inflammation of the thyroid gland (hyperthyroidism, hypothyroidism)</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• rapid heart beat</li> <li>• weight loss or gain</li> <li>• increased sweating</li> <li>• hair loss</li> <li>• feeling cold</li> <li>• constipation or diarrhea</li> <li>• your voice gets deeper</li> <li>• muscle aches</li> <li>• changes in sleep patterns</li> </ul>	<p>Common             (less than 1 in 10 but more than 1 in 100)</p>
<p><b>Inflammation of the pituitary gland (hypophysitis, hypopituitarism, including secondary adrenal insufficiency)</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• weight loss</li> <li>• increased sweating, hot flashes</li> <li>• hair loss (includes facial and pubic)</li> <li>• feeling cold</li> <li>• headaches that will not go away or unusual headache</li> <li>• decreased sex drive</li> <li>• vision problems</li> <li>• excessive thirst and urination</li> </ul>	<p>Common             (less than 1 in 10 but more than 1 in 100)</p>

SERIOUS SIDE EFFECTS	How common is it?
<p><b>Inflammation of the lungs (pneumonitis)</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• shortness of breath</li> <li>• chest pain</li> <li>• coughing</li> </ul>	<p>Common             (less than 1 in 10 but more than 1 in 100)</p>
<p><b>Problems with muscles</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• back pain</li> <li>• spasms</li> <li>• weakness</li> <li>• muscle pain</li> </ul>	<p>Common             (less than 1 in 10 but more than 1 in 100)</p>
<p><b>Skin problems</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• rash</li> <li>• dry skin</li> </ul>	<p>Common             (less than 1 in 10 but more than 1 in 100)</p>
<p><b>Problems in other organs (nervous system, eyes)</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• tingling, numbness, lack of energy</li> <li>• changes in eyesight</li> <li>• dizziness</li> </ul>	<p>Common             (less than 1 in 10 but more than 1 in 100)</p>
<p><b>Inflammation of the liver (hepatitis)</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• nausea or vomiting</li> <li>• loss of appetite</li> <li>• pain on the right side of your stomach</li> <li>• yellowing of your skin or the whites of your eyes</li> <li>• dark urine</li> <li>• bleeding or bruise more easily than normal</li> </ul>	<p>Uncommon             (less than 1 in 100 but more than 1 in 1000)</p>
<p><b>Inflammation of the kidneys (nephritis)</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• changes in the amount or colour of your urine</li> </ul>	<p>Uncommon             (less than 1 in 100 but more than 1 in 1000)</p>

SERIOUS SIDE EFFECTS	How common is it?
<p><b>Problems in the pancreas</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• abdominal pain</li> <li>• nausea and vomiting</li> </ul>	<p>Rare</p> <p>(less than 1 in 1000  but more than 1 in  10000)</p>
<p><b>Blood sugar problems (type 1 diabetes mellitus)</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• hunger or thirst</li> <li>• a need to urinate more often</li> <li>• weight loss</li> </ul>	<p>Rare</p> <p>(less than 1 in 1000  but more than 1 in  10000)</p>
<p><b>Infusion reactions</b>  <i>Symptoms may include:</i></p> <ul style="list-style-type: none"> <li>• shortness of breath</li> <li>• itching or rash</li> <li>• dizziness</li> <li>• fever</li> <li>• wheezing</li> <li>• flushing</li> <li>• feeling like passing out</li> </ul>	<p>Rare</p> <p>(less than 1 in 1000  but more than 1 in  10000)</p>



## Management of Other Side Effects

OTHER SIDE EFFECTS	How common is it?	MANAGEMENT
<p>Your <b>white blood cells</b> will decrease a few days after your treatment. They usually return to normal in 2-3 weeks. White blood cells protect your body by fighting bacteria (germs) that cause infection. When they are low, <b>you are at greater risk of having an infection.</b></p>	Common	<p>To help prevent infection:</p> <ul style="list-style-type: none"> <li>• Wash your hands often and always after using the bathroom.</li> <li>• Take care of your skin and mouth by gently washing regularly.</li> <li>• Avoid crowds and people who are sick.</li> <li>• Call your doctor <b>immediately</b> at the first sign of an <b>infection</b> such as fever (over 100°F or 38°C by an oral thermometer), chills, cough or burning when you pass urine.</li> </ul>
<p>Your <b>platelets</b> may decrease during or after your treatment They will return to normal after your last treatment. Platelets help to make your blood clot when you hurt yourself. <b>You may bruise or bleed more easily than usual.</b></p>	Common	<p>To help prevent bleeding problems:</p> <ul style="list-style-type: none"> <li>• Try not to bruise, cut or burn yourself.</li> <li>• Clean your nose by blowing gently, do not pick your nose.</li> <li>• Avoid constipation.</li> <li>• Brush your teeth gently with a soft toothbrush as your gums may bleed more easily. Maintain good oral hygiene.</li> <li>• Avoid taking ASA (e.g. ASPIRIN®) or Ibuprofen (e.g. ADVIL®), <i>unless prescribed by your doctor.</i></li> </ul>
<p><b>Tiredness</b> and lack of energy may sometimes occur.</p>	Very Common	<ul style="list-style-type: none"> <li>• Do not drive a car or operate machinery if you are feeling tired.</li> <li>• Try the ideas in <i>Your Bank to Energy Savings: Helping People with Cancer Handle Fatigue.*</i></li> <li>• If tiredness is persistent and you have other symptoms of <b>hepatitis or inflammation of glands</b>, tell your doctor as soon as possible. (see the table above for serious side effects.)</li> </ul>

OTHER SIDE EFFECTS	How common is it?	MANAGEMENT
<b>Loss of appetite</b> and <b>weight loss</b> sometimes occur.	Very Common	<ul style="list-style-type: none"> <li>• Try the ideas in <i>Food Ideas to Help with Decreased Appetite</i>.*</li> <li>• If loss of appetite is persistent and you have other symptoms of <b>hepatitis</b>, tell your doctor as soon as possible. (see the table above for serious side effects.)</li> </ul>
<b>Nausea</b> and <b>vomiting</b> may occur after your treatment. Nausea may last longer for some patients (delayed nausea and vomiting)	Very Common	<ul style="list-style-type: none"> <li>• You will be given a prescription for anti-nausea drug(s) to take before your treatment and/or at home. <b>It is easier to prevent nausea than treat it once it has occurred</b>, so follow directions closely.</li> <li>• Drink plenty of fluids.</li> <li>• Eat and drink often in small amounts.</li> <li>• Try the ideas in <i>Food Choices to Help Control Nausea</i>.*</li> <li>• Your doctor may manage delayed nausea and vomiting differently. Be sure to let your doctor know if you experience this.</li> </ul>
<b>Constipation</b> may sometimes occur.	Common	<ul style="list-style-type: none"> <li>• Exercise if you can.</li> <li>• Drink plenty of fluids.</li> <li>• Try ideas in <i>Suggestions for Dealing with Constipation</i>.*</li> <li>• If you have other symptoms of <b>colitis</b>, tell your doctor as soon as possible. (see the table above for serious side effects.)</li> </ul>
<b>Fever</b> may sometimes occur.	Common	<ul style="list-style-type: none"> <li>• Call your doctor <b>immediately</b> at the first sign of an <b>infection</b> such as fever (over 100°F or 38°C by an oral thermometer), chills, cough or burning when you pass urine.</li> <li>• If you have other symptoms of <b>colitis</b>, tell your doctor as soon as possible. (see the table above for serious side effects.)</li> </ul>
<b>Headache</b> may sometimes occur.	Common	<ul style="list-style-type: none"> <li>• If headache is persistent and you have other symptoms of <b>inflammation of glands</b>, tell your doctor as soon as possible. (see the table above for serious side effects.)</li> </ul>

OTHER SIDE EFFECTS	How common is it?	MANAGEMENT
<p><b>Sore mouth</b> may occur a few days after treatment. Mouth sores can occur on the tongue, the sides of the mouth or in the throat. <i>Mouth sores or bleeding gums can lead to an infection.</i></p>	Uncommon	<ul style="list-style-type: none"> <li>• Brush your teeth gently after eating and at bedtime with a very soft toothbrush. If your gums bleed, use gauze instead of a brush. Use baking soda instead of toothpaste.</li> <li>• Make a mouthwash with ½ teaspoon baking soda or salt in 1 cup warm water and rinse several times a day.</li> <li>• Try soft, bland foods like puddings, milkshakes and cream soups.</li> <li>• Avoid spicy, crunchy or acidic food, and very hot or cold foods.</li> <li>• Call your doctor if you are having difficulty eating or drinking due to pain.</li> </ul>
<p><b>Pain or tenderness</b> may occur where the needle was placed in your vein</p>	Uncommon	<ul style="list-style-type: none"> <li>• Apply cool compresses or soak in cool water for 10-20 minutes several times a day.</li> </ul>
<p><b>Hair loss</b> is rare.</p>	Rare	<ul style="list-style-type: none"> <li>• If hair loss is a problem, refer to <i>For the Patient: Hair Loss Due to Chemotherapy</i>.*</li> </ul>
<p><b>Allergic reactions</b> are rare. Signs of an allergic reaction are dizziness, confusion and wheezing or difficulty breathing. This reaction can occur immediately or several hours after receiving treatment.</p>	Rare	<ul style="list-style-type: none"> <li>• Tell your nurse if this happens while you are receiving treatment.</li> <li>• Go to your local Emergency Room immediately if this happens after you leave the clinic.</li> </ul>
<p>Cisplatin <b>burns</b> if it leaks under the skin</p>	Very Rare	<ul style="list-style-type: none"> <li>• Tell your nurse <b>immediately</b> if you feel pain, burning, stinging, or any other change while the drug is being given.</li> </ul>

\*Please ask your oncologist or pharmacist for a copy.

**If you experience symptoms or changes in your body that have not been described above but worry you, or in any symptoms are severe, contact:**

\_\_\_\_\_ at telephone number: \_\_\_\_\_



Provincial Health Services Authority

**MEDICAL  
ALERT**

NAME \_\_\_\_\_

has received

**CHECKPOINT INHIBITOR IMMUNOTHERAPY:**

**Immune-Mediated Adverse Reactions**

**ALWAYS CARRY THIS CARD AND SHOW TO  
PHYSICIANS INCLUDING ANESTHETISTS**

**SEVERE IMMUNE-MEDIATED ADVERSE REACTIONS**

Including enterocolitis, intestinal perforation, hepatitis, dermatitis (including toxic epidermal necrolysis), neuropathy, endocrinopathy, pneumonitis, myositis, myocarditis and toxicities in other organ systems. Duration of risk after treatment is unknown.

**FOR MORE INFORMATION:**

- BC Cancer - Abbotsford .....604-851-4710
- BC Cancer - Kelowna .....250-712-3900
- BC Cancer - Prince George.....250-645-7300
- BC Cancer - Surrey .....604-930-4055
- BC Cancer - Vancouver.....604-877-6000
- BC Cancer - Victoria.....250-519-5500

[www.bccancer.bc.ca/health-professionals/professional-resources/cancer-drug-manual](http://www.bccancer.bc.ca/health-professionals/professional-resources/cancer-drug-manual)

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To Whom It May Concern:

RE: \_\_\_\_\_

Medical Oncologist \_\_\_\_\_

Immunotherapy Regimen \_\_\_\_\_

This patient is receiving **immunotherapy** at the BC Cancer and is at risk of **immune-related toxicities** which may be life threatening and require urgent management.

Immunotherapy toxicities are different from those encountered with standard chemotherapy or targeted therapies. The immune system may become dysregulated during immunotherapy treatment, leading to symptoms and findings which mimic autoimmune disorders. Adverse events can occur during or following treatment and can be life threatening. Any organ system in the body is at risk including, but not limited to:

- Lungs (pneumonitis, pleuritis, sarcoidosis)
- Gastrointestinal (colitis, ileitis, pancreatitis)
- Liver (hepatitis)
- Skin (rash, Stevens-Johnson syndrome)
- Endocrine (hypophysitis, adrenal insufficiency, hypo/hyperthyroidism, type 1 diabetes mellitus)
- Renal (interstitial nephritis)
- Blood (hemolytic anemia, thrombocytopenia, neutropenia)
- Neurologic (encephalitis, Guillain-Barré syndrome, meningitis, myasthenia gravis, neuropathy)
- Musculoskeletal (myositis, arthritis)
- Cardiovascular (pericarditis, myocarditis, vasculitis)
- Ophthalmologic (uveitis, scleritis, episcleritis, conjunctivitis, retinitis)

Management of immune-related toxicities necessitates prompt coordination with a medical oncologist with **initiation of high dose corticosteroids**, and may require referral to the appropriate subspecialty. If you suspect your patient is presenting with immune-related toxicity, **please contact the patient's medical oncologist** directly or if after hours contact the on-call physician, or as per your local centre's process (next page). Additional information on immunotherapy toxicity treatment algorithms is located at the end of the above posted protocol at [www.bccancer.bc.ca](http://www.bccancer.bc.ca).

BC CANCER CENTRES	CONTACT INFORMATION AND PROCESS
<b>Abbotsford</b>	Contact the patient's medical oncologist immediately by calling the Abbotsford Regional Hospital and Cancer Centre (ARHCC) switchboard at (604) 851-4700 and ask for the on-call medical oncologist (24-hour call system).
<b>Kelowna</b>	Between 8:30 am – 5:00 pm, call (250) 712-3900 (press "8" to speak to the Kelowna Centre receptionist) and have an oncologist paged. Outside these hours, call the Kelowna General Hospital switchboard at (250) 862-4000 and ask for the on-call medical oncologist.
<b>Prince George</b>	Between 8:30 am – 4:00 pm Monday to Friday, call (250) 645-7313. Outside these hours, go to the emergency department at the University Hospital of Northern British Columbia (UHNBC).
<b>Surrey</b>	Between 8:30 am – 4:00 pm Monday to Friday (except Statutory holidays), call the Nursing Phone Line at (604) 930-4053. Outside these hours, call the Surrey Memorial Hospital switchboard at (604) 581-2211 and ask for the Fraser Valley on-call medical oncologist.
<b>Vancouver</b>	Between 8:30 am – 4:30 pm Monday to Friday, call the Patient Nurse Line at (604) 877-6025. Outside these hours, call the inpatient unit at (604) 877-6000 and press 1, and ask for the on-call medical oncologist.
<b>Victoria</b>	Between 8:30 am – 4:30 pm Monday-Friday (except Statutory holidays), call (250) 519-5500, and press 1 then 4 to speak with a registered nurse. Outside these hours, call the Royal Jubilee Hospital switchboard at (250) 370-8000 and ask for the on-call medical oncologist.