

BC Cancer Summary for Palliative Treatment of Metastatic or Inoperable, Locally Advanced Gastric or Gastroesophageal Junction Adenocarcinoma using CISplatin, Infusional Fluorouracil and Trastuzumab

Protocol Code:

GIGAVCFT

Tumour Group:

Gastrointestinal

Contact Physician:

GI Systemic Therapy

ELIGIBILITY:

Patients must have:

- Metastatic or inoperable locally advanced gastric or gastroesophageal junction adenocarcinoma, **and**
- HER-2 overexpression defined as either IHC3+, or FISH amplification ratio of greater than or equal to 2 per BCCA central laboratory
NOTE: Patients are still eligible for this protocol if they receive less than or equal to 3 cycles of standard chemotherapy while the results of HER-2 testing are pending, **and**
- No prior chemotherapy, greater than 6 weeks from prior radiation therapy, greater than 3 weeks from surgery

Patients should have:

- ECOG performance status 0 to 2,
- No signs or symptoms of cardiac disease. For patients with cardiac risk factors or history of cardiac disease, a MUGA or ECHO should be done to document normal left ventricular ejection fraction (LVEF).
- Adequate marrow reserve, renal and liver function

EXCLUSIONS:

Patients must not have:

- Clinically significant cardiac disease (history of symptomatic ventricular arrhythmias, congestive heart failure or myocardial infarction within previous 12 months), unstable angina, uncontrolled high blood pressure
- Baseline LVEF less than 50%
- Suspected Dihydropyrimidine Dehydrogenase (DPD) deficiency (see Precautions)

TESTS:

- Baseline: CBC & Diff, creatinine, ALT, alkaline phosphatase, **total bilirubin**, **albumin**, sodium, potassium, **DPYD test** (not required if previously tested, or tolerated fluorouracil or capecitabine)
- Baseline if clinically indicated: CEA, CA 19-9, **GGT**, ECG, echocardiogram, or MUGA scan
- Prior to each treatment: CBC & Diff, creatinine, **total bilirubin**, **ALT**
- If clinically indicated: CEA, CA 19-9, alkaline phosphatase, **albumin**, **GGT**, **sodium**, **potassium**, **ECG**, MUGA scan or echocardiogram
- For patients on warfarin, weekly INR during fluorouracil therapy until stable warfarin dose established, then INR prior to each cycle

PREMEDICATIONS:

- Antiemetic protocol for highly emetogenic chemotherapy (see [SCNAUSEA](#) protocol)
- Not usually required for trastuzumab

TREATMENT:

Drug	Dose	BC Cancer Administration Guideline
CISplatin	80 mg/m ²	Prehydrate with 1000 mL NS over 1 hour, then give CISplatin IV in 500 mL NS with 20 mEq potassium chloride, 1 g magnesium sulfate, 30 g mannitol over 1 hour
trastuzumab	8 mg/kg for 1 st cycle ONLY,	IV in 250 mL NS over 1 hour 30 min for 1 st cycle (Observe for 1 hour post-infusion)
	then 6 mg/kg with subsequent cycles	IV in 250 mL NS over 1 hour for 2 nd cycle and over 30 min for all subsequent cycles. (Observe for 30 minutes post-infusion*)
fluorouracil	800 mg/m ² /day for 5 days (total dose = 4000 mg/m ² over 120h)	IV in D5W to a total volume of 240 mL by continuous infusion at 2 mL/h via appropriate infusor device**

*Observation period not required after 3 consecutive treatments with no reaction

**Inpatients: 800 mg/m²/day in 1000 mL D5W by continuous infusion daily over 24 h for 5 days

Patients with PICC lines should have a weekly assessment of the PICC site for evidence of infection or thrombosis.

- Repeat every 21 days x 6 cycles
- Discontinue therapy if there is lack of response after 2-3 cycles
- Trastuzumab can be continued as single agent until disease progression following 6 cycles with chemotherapy. (See protocol GIGAVTR.)

DOSE MODIFICATIONS:**Fluorouracil Dosing Based on DPYD Activity Score (DPYD-AS)**

Refer to “Fluorouracil and Capecitabine Dosing Based on DPYD Activity Score (DPYD-AS)” on www.bccancer.bc.ca/health-professionals/clinical-resources/cancer-drug-manual.

1. Hematology: For CISplatin and fluorouracil

ANC (x 10 ⁹ /L)		Platelets (x 10 ⁹ /L)	Dose
greater than or equal to 1.5	and	greater than or equal to 100	100%
1.0 to less than 1.5	or	75 to less than 100	Delay* then 100% for 1 st event**
less than 1.0	or	less than 75	Delay* then 75%

*Delay until ANC greater than or equal to 1.5 x 10⁹/L and platelets greater than or equal to 75 x 10⁹/L

**Consider dose reduction to 75% for subsequent events and/ or prolonged delays of more than 2 wks

2. Gastrointestinal toxicity: For fluorouracil

Grade	Stomatitis	Diarrhea	Dose Fluorouracil
Grade 1	Painless ulcers, erythema or mild soreness	Increase of 2-3 stools/day or nocturnal stools; or moderate increase in loose watery colostomy output	100%
Grade 2	Painful erythema, edema, or ulcers but can eat	Increase of 4-6 stools/day, or nocturnal stools or moderate increase in loose watery colostomy output	75%
Grade 3 or 4	As above, but cannot eat, mucosal necrosis, requires parenteral support.	Increase of greater than 7 stools/day or grossly bloody diarrhea, or incontinence, malabsorption; or severe increase in loose watery colostomy output requiring parenteral support	Discontinue or delay until toxicity resolved then resume at 50%.

3. Hand-Foot Syndrome for fluorouracil

Grade	Hand-Foot Syndrome	Dose
Grade 1	Skin changes or dermatitis without pain e.g. erythema, peeling	100%
Grade 2	Skin changes with pain not interfering with function	75% until resolved then consider increasing dose by 10%
Grade 3	Skin changes with pain, interfering with function	Delay until resolved then resume at 75% (150 mg/m ² /24 hr)

4. Renal dysfunction: for CISplatin

Calculated Creatinine Clearance (mL/min) by Cockcroft/Gault formula	CISplatin dose
Greater than or equal to 60	100%
45-59	75%
Less than 45	Hold CISplatin or delay with additional IV fluids

Cockcroft/Gault formula:

$$CrCl = \frac{N (140 - \text{age}) \times \text{weight (kg)}}{\text{serum creatinine (micromol/L)}}$$

Where N = 1.04 for females, and 1.23 for males

5. Treatment Interruptions – Trastuzumab: If an interruption in treatment of greater than 6 weeks occurs (i.e. more than 6 weeks has elapsed since the last treatment was given), consider repeating the loading dose of 8 mg/kg, and then resume usual dosing.

PRECAUTIONS:

- Cardiac toxicity:** Trastuzumab can produce ventricular dysfunction and congestive heart failure in less than 2% of patients. The majority of patients who develop cardiac dysfunction are symptomatic. Regular monitoring of asymptomatic patients is not routinely necessary but can be considered after 6 months of treatment with trastuzumab. If no significant decline in cardiac function, repeated testing is not generally necessary, unless clinically indicated. Discontinue treatment for symptomatic congestive heart failure or serious cardiac arrhythmias. **Myocardial ischemia and angina occurs rarely in patients receiving fluorouracil or capecitabine.** Development of cardiac symptoms including signs suggestive of ischemia or of cardiac arrhythmia is an indication to discontinue treatment. If there is development of cardiac symptoms patients should have urgent cardiac assessment. Generally re-challenge with either fluorouracil or capecitabine is not recommended as symptoms potentially have a high likelihood of recurrence which can be severe or even fatal. Seeking opinion from cardiologists and oncologists with expert knowledge about fluorouracil / capecitabine toxicity is strongly advised under these circumstances. The toxicity should also be noted in the patient's allergy profile.
- Trastuzumab infusion-associated symptoms**, usually chills and fever, can occur in some patients during the first trastuzumab infusion. Symptoms may be treated with acetaminophen, diphenhydramine and meperidine with or without an infusion rate reduction. Rarely, serious infusion-related reactions have been reported. For serious reactions, discontinue the trastuzumab infusion and provide supportive therapy such as oxygen, beta-agonists and corticosteroids.
- Neutropenia:** Fever or other evidence of infection must be assessed promptly and treated aggressively. Refer to BC Cancer Febrile Neutropenia Guidelines.
- Renal Toxicity:** Nephrotoxicity is common with CISplatin. Encourage oral hydration. Avoid nephrotoxic drugs such as aminoglycoside antibiotics.
- Ototoxicity and sensory neural damage** should be assessed by history prior to each cycle.
- Diarrhea:** Patients should report mild diarrhea that persists over 24 hours or moderate diarrhea (4 stools or more per day above normal, or a moderate increase in ostomy output). Mild diarrhea can be treated with loperamide (eg. IMODIUM®) following the manufacturer's directions or per the BC Cancer [Guidelines for Management of Chemotherapy-Induced Diarrhea](#). Note that diarrhea may result in increased INR and the risk of bleeding in patients on warfarin.
- Dihydropyrimidine dehydrogenase (DPD) deficiency** may result in severe and unexpected toxicity – stomatitis, diarrhea, neutropenia, neurotoxicity – secondary to reduced drug metabolism. This deficiency is thought to be present in about 3% of the population.

8. **Possible drug interaction with fluorouracil and warfarin** has been reported and may occur at any time. For patients on warfarin, weekly INR during fluorouracil therapy is recommended until a stable warfarin dose is established. Thereafter, INR prior to each cycle. Consultation to cardiology/internal medicine should be considered if difficulty in establishing a stable warfarin dose is encountered. Upon discontinuation of fluorouracil, repeat INR weekly for one month.
9. **Possible drug interaction with fluorouracil and phenytoin and fosphenytoin** has been reported and may occur at any time. Close monitoring is recommended. Fluorouracil may increase the serum concentration of these two agents.
10. A drug interaction with **trastuzumab and warfarin** has also been reported.

Call the GI Systemic Therapy physician at your regional cancer centre or the GI Systemic Therapy Chair Dr. Janine Davies at (604) 877-6000 or 1-800-663-3333 with any problems or questions regarding this treatment program.

References:

1. Van Cutsem E, Kang Y, Chung H, et al. Efficacy results from the ToGA trial: A phase III study of trastuzumab added to standard chemotherapy (CT) in first-line human epidermal growth factor receptor 2 (HER2)-positive advanced gastric cancer (GC). J Clin Oncol 2009; 27(15s): Abstract LBA4509.
2. Bang YJ, Chung HC, Xu JM, et al. Pathological features of advanced gastric cancer: relationship to human epidermal growth factor receptor 2 positivity in the global screening programme of the ToGA trial. J Clin Oncol 2009; 27(15s): Abstract 4556.