BC Cancer Agency
CARE & RESEARCH

Systemic Therapy Update

Volume 11, Number 4 *for health professionals who care for cancer patients* April 2008
Website access at http://www.bccancer.bc.ca/HPI/ChemotherapyProtocols/stupdate.htm

INSIDE THIS ISSUE

EDITOR'S CHOICE

FREQUENTLY ASKED QUESTIONS: FLUOROURACIL INFUSION DEVICES

Q1: Why is the BCCA switching to Baxter Infusors for continuous fluorouracil (5-FU) infusions (see February 2008 Update)?

A: The use of Infusors (fixed-rate elastomeric balloon infusion devices) is one of several recommendations made by the Institute for Safe Medication Practice (ISMP) to increase patient safety. The BCCA has chosen to implement this recommendation and has switched to Infusors for delivery of continuous 5-FU infusions. Because a fixed flow rate is inherent in the design of the device, programming is not required. Baxter's Infusors were selected by the BCCA because they are readily available and, through many years of use and in-house pilot studies, we found that their performance standards meet our needs. In addition, they were chosen for patient convenience; to optimize drug preparation; and because they can deliver the desired volume and flow rate for the infused protocol. Other fixed-rate infusion devices may be used, provided that they are able to administer the ordered dose over the ordered infusion duration.

Q2: How do Infusors work?

A: The fluorouracil is diluted with D5W as necessary to deliver the ordered hourly dose in the fixed hourly flow rate of the Infusor. The mixture is injected into a balloon reservoir which inflates inside a rigid transparent shell. As the balloon deflates, the solution is pushed through a flow restrictor that regulates the flow to the labelled mL/hr rate.

Q3: What different types of Infusors are available?

A: There are two Infusor design shapes available from Baxter – tubular and rounded (looks like a baby bottle). Both designs are available in different maximum volume capacities and fixed flow rates. Some examples of the two shapes of Infusors are:

Baxter's Description	Shape	Fixed Flow Rate	Maximum volume	Residual Volume	Catalog #
Two-Day Infusor	Tubular	2 mL/hr	105 mL	2.5 mL	2C1075KJP
Infusor SV2	Baby bottle	2 mL/hr	105 mL	1 mL	2C1702KP
Infusor LV5	Baby bottle	5 mL/hr	300 mL	3 mL	2C1009KP

- Both the "Two Day Infusor" and the "Infusor SV2" are able to deliver a 46- or 48-hour infusion, at 2 mL/hr. Either shape is acceptable for 46- or 48-hour infusions, but the baby bottle shape has a smaller residual volume and therefore more of the intended dose is delivered to the patient.
- The "Infusor LV5" can also deliver a 46- or 48-hour infusion, but at 5 mL/hr; so it is suitable for larger doses.

The BCCA has chosen to use Baxter's "baby bottle" design exclusively. The Infusors listed in the February 2008 Update were chosen by the BCCA for use in the given protocols, because they have the appropriate combination of volume capacity and flow rate to allow delivery of the ordered dose and infusion duration in those protocols.

Q4: What do "SV" and "LV" and the numbers following them mean?
A: "SV" = "small volume"; "LV"= "large volume". SV Infusors have a maximum capacity of 105 mL, LV ones have a maximum capacity of 300 mL. The number following indicates the fixed flow rate of that device.

Q5: If our hospital has the tubular "Two Day Infusor", can we use it if the BCCA provincial pre-printed order specifies "SV2"?
A: Yes. The "Two Day Infusor" can be substituted for the SV2 specified in a BCCA pre-printed order. Residual volumes remaining in both devices are within the acceptable 5% accuracy.

Q5: Why do the pre-printed orders specify which Infusor to use? The protocols don't.
A: Protocols are intended to provide a broad standard of treatment, whereas pre-printed orders are developed to provide specific details on the preparation and administration of that treatment.

Q6: How are the volumes of 5-FU and D5W calculated for the various protocols?
A: The BCCA pre-printed order for a protocol (refer to February 2008 Update) indicates which Infusor and the required volume to use for that protocol. Calculate the volume of 5-FU required for the total 5FU ordered dose. Subtract the volume of 5-FU from the final total volume to determine the volume of D5W required to make up the final total volume. You may also contact one of the four CON Pharmacy Educators for copies of calculation formulas used in the BCCA Centres.

Q7: Why does the table in the Update list both SV2 and LV5 Infusors for 46- and 48-hour infusions?
A: An SV2 Infusor can deliver only 2 mL/hr (a maximum of 100 mg of 5-FU per hour), even if it were not diluted with D5W. The dose of 5-FU for large patients on some protocols may exceed 100 mg/hr, and an LV5, which can deliver a larger hourly dose, is necessary. While an LV5 Infusor could be used for all 46- and 48-hour infusions, the SV2 option was chosen by BCCA for the lower doses because it allows a smaller, lighter final product that is preferred by patients. The SV2 maximum cut-off doses of 4400 and 4600 mg were chosen to ensure that there would be at least some D5W present with which to prime the tubing.

Q8: Can an LV2 be used instead of an SV2 to infuse 92 mL, or must we stock both sizes?
A: For best accuracy of flow rate, Infusors should be filled to at least 80% of their "nominal volume". Filling with less than 80% of the nominal volume may result in a 5% increase in flow rate; less than 60% of nominal volume may result in a 10% increase in flow rate, leading to shorter infusion durations than ordered. Note that nominal volume is not the same as maximum volume capacity. Nominal volumes are listed in the product monograph which accompanies the Infusors. Example: LV2 Infusors have a nominal volume of 240 mL, so should be filled with at least 80% x 240 mL = 192 mL for optimal flow accuracy.

Q9: WorkSafe BC requires that the solution in the Infusor tubing be drug-free. How can we do this?
A: Inject the calculated volume of D5W diluent into the Infusor first and allow the tubing to prime before adding the 5-FU.

Q10: Can we use NS instead of D5W as the diluent for 5-FU in an Infusor?
A: No. Flow rate is affected by the viscosity of the solution. Infusors are designed to operate at the labelled flow rate when the diluent is D5W. Substituting a less viscous diluent such as NS may increase the flow rate by approximately 10%.

Q11: Why does BCCA no longer recommend that overfill be added to Infusors to compensate for residual volume?
A: The calculations required for addition of overfill is a potential source of error. Since the residual volume represents such a small percentage of the total volume, it will no longer be taken into consideration. Also, in further compliance with ISMP recommendations, the dosing information on the Infusor label, medication administration record (MAR), and the doctor's order will be consistent.

Q12: Why is BCCA still using cassette pumps for 3-day (72-hr) infusions?
A: Unfortunately, there is currently no Infusor available with the flow rate and volume capacity suitable for the 72-hour infusions. Unlike fixed rate Infusors, cassette pumps require programming for flow rates and are therefore a source of error which we wish to avoid. Moreover, no standard protocols with 72 hour infusions are currently available at the BCCA.

Q13: Who can give us a hands-on demonstration on filling the various Infusors?
A: Contact your local Baxter representative for instruction on how to fill Infusors.

Submitted by:
Marianne Moore, BSc(Pharm)
Pharmacy CON Educator
Vancouver Centre – BC Cancer Agency

Reviewed by:
Dennis Jang, BSc(Pharm)
Drug Distribution Coordinator
Vancouver Centre – BC Cancer Agency

LIST OF NEW AND REVISED PROTOCOLS, PRE-PRINTED ORDERS AND PATIENT HANDOUTS

BC Cancer Agency Protocol Summaries, Provincial Pre-Printed Orders (PPPOs) and Patient Handouts are revised periodically. New and revised protocols, PPPOs and patient handouts for this month are listed below. Protocol codes for treatments requiring "Compassionate Access Program" (previously Undesignated Indication Request) approval are prefixed with the letter **U**.

REVISED PROTOCOLS, PPPOS AND PATIENT HANDOUTS (AFFECTED DOCUMENTS ARE CHECKED):

CODE	Protocol	PPPO	Patient Handout	Changes	Protocol Title
BRLAACD	☐	☑	☐	*Administration of docetaxel clarified*	Treatment of Locally Advanced Breast Cancer using Doxorubicin and Cyclophosphamide followed by Docetaxel (TAXOTERE®).
GIFUC	☐	☑	☐	*Fluorouracil infusion order clarified*	Palliative Chemotherapy for Upper Gastrointestinal Tract Cancer (Gastric, Esophageal, Gall Bladder Carcinoma and Cholangiocarcinoma) and Metastatic Anal Cancer using Infusional Fluorouracil and Cisplatin

CODE	Protocol	PPPO	Patient Handout	Changes	Protocol Title
UHNCETRT	☑	☑	☐	*Number of treatment cycles clarified*	Combined Cetuximab and Radiation Treatment for Locally Advanced Squamous Cell Carcinoma of the Head and Neck
HNLAPRT	☑	☐	☐	*Antiemetic revised*	Combined Chemotherapy Cisplatin and Radiation Treatment for Locally Advanced Squamous Cell Carcinoma of the Head and Neck
LYCHOPR	☐	☑	☐	*Administration of vincristine clarified*	Treatment of Lymphoma with Doxorubicin, Cyclophosphamide, Vincristine, Prednisone and Rituximab

CONTINUING EDUCATION

BC Cancer Agency Provincial Nursing Symposium – Cancer Care Update 2008 will be held on **5 April, 2008**, in **Richmond BC**. Register **now** for this one day symposium if you wish to:

- Update your knowledge about new emerging trends in the treatment of breast, colorectal and lung cancers.
- Extend your skills in management of complex symptoms.
- Feel more comfortable addressing issues related to sexuality with patients and families.
- Learn new ways to effectively communicate with patients and families under challenging situations.
- Plan more effective strategies to assist cancer survivors in moving through the recovery process.
- Expand your repertoire of self-care measures for nurturing professional health and wellbeing.

Further information about this upcoming conference and how to register will be available on the website at www.cancercare08.ca.

WEBSITE RESOURCES

The following are available on the BC Cancer Agency website (www.bccancer.bc.ca) under the Health Professionals Info section:

REIMBURSEMENT AND FORMS: BENEFIT DRUG LIST, CLASS II, COMPASSIONATE ACCESS PROGRAM (UNDESIGNATED INDICATION)	www.bccancer.bc.ca/HPI/ChemotherapyProtocols/Forms
CANCER DRUG MANUAL	www.bccancer.bc.ca/cdm
CANCER MANAGEMENT GUIDELINES	www.bccancer.bc.ca/CaMgmtGuidelines
CANCER CHEMOTHERAPY PROTOCOLS AND PROVINCIAL PRE-PRINTED ORDERS	www.bccancer.bc.ca/ChemoProtocols
SYSTEMIC THERAPY PROGRAM POLICIES	www.bccancer.bc.ca/HPI/ChemotherapyProtocols/Policies
UNCONVENTIONAL CANCER THERAPIES MANUAL	under Patient/Public Info, Unconventional Therapies

IN TOUCH	www.bccancer.bc.ca	bulletin@bccancer.bc.ca
BC CANCER AGENCY	(604) 877-6000	Toll-Free 1-(800) 663-3333
COMMUNITIES ONCOLOGY NETWORK	Ext 2744	jvenkate@bccancer.bc.ca
EDUCATION RESOURCE NURSE	Ext 2638	nursinged@bccancer.bc.ca
NURSING PROFESSIONAL PRACTICE	Ext 2623	ilundie@bccancer.bc.ca
PHARMACY PROFESSIONAL PRACTICE	Ext 2247	gconcon@bccancer.bc.ca
PROVINCIAL SYSTEMIC THERAPY PROGRAM	Ext 2247	gconcon@bccancer.bc.ca
COMMUNITIES ONCOLOGY NETWORK PHARMACIST	Ext 6277	lkovacic@bcancer.bc.ca
DRUG INFORMATION	Ext 6275	druginfo@bccancer.bc.ca
LIBRARY/CANCER INFORMATION	1-(888)-675-8001	requests@bccancer.bc.ca
OSCAR HELP DESK	Ext 8003 1-(888)-355-0355 Fax (604) 708-2051	oscar@bccancer.bc.ca
COMPASSIONATE ACCESS PROGRAM OFFICE (FORMERLY UNDESIGNATED DRUG APPLICATION OFFICE)	Ext 6277 Fax (604) 708-2026	cap_bcca@bccancer.bc.ca
UPDATE EDITOR	Ext 2288	mdelemos@bccancer.bc.ca
CENTRE FOR THE SOUTHERN INTERIOR (CCSI)	(250) 712-3900	Toll-Free 1-(888) 563-7773
FRASER VALLEY CENTRE (FVCC)	(604) 930-2098	Toll-Free 1-(800) 523-2885
VANCOUVER CENTRE (VCC)	(604) 877-6000	Toll-Free 1-(800) 663-3333
VANCOUVER ISLAND CENTRE (VICC)	(250) 519-5500	Toll-Free 1-(800) 670-3322