

# Systemic Therapy Update



BC Cancer Agency

CARE + RESEARCH

An agency of the Provincial Health Services Authority

August 2010

Volume 13, Number 8

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For health professionals who care for cancer patients  
Available online at [www.bccancer.bc.ca/HPI/ChemotherapyProtocols/stupdate](http://www.bccancer.bc.ca/HPI/ChemotherapyProtocols/stupdate)

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## EDITOR'S CHOICE

### NURSING UPDATE – SUPPORTING SAFE HOME DISCONTINUATION OF INFUSORS™ FOR BC CANCER AGENCY PATIENTS

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Between April 2007 and March 2010, there was a 36% increase in the number of patients receiving ambulatory infusional chemotherapy via central line at BCCA regional cancer centers. Eight hundred and thirty-eight patients were treated using Baxter INFUSORS™ last year and 6567 INFUSORS™ were dispensed to those patients.

At the end of each ambulatory continuous infusional treatment, the empty INFUSOR™ must be disconnected (DC) and disposed of, and the patient's central line flushed to maintain patency. Typically, this has required a scheduled visit to a cancer center, hospital, or chemo unit, or a visit to the patient's home by a Home Care nurse.

Travel to a centre, parking and waiting can be costly. As well, patient's energy levels are compromised by this process. The option of requesting that a Home Care nurse discontinue the INFUSOR™ in the patient's home is becoming increasingly challenging because of community nursing staff shortages. (Home Care cannot support this procedure in some health authorities). As well, it is difficult for the Home Care nurse to schedule a visit that coincides with INFUSOR™ completion time.

The increase in numbers of ambulatory infusional treatments delivered poses new challenges to the care system and an opportunity to consider alternative approaches. In the past 3 years, several steps have been taken to increase the efficacy and safety of infusional chemotherapy in hospital and at home. At the BCCA Fraser Valley Centre, registered nurses Seana Hutchison and Shelley Dick trialed a program at their centre to support patients to have their INFUSORS™ discontinued and their venous access devices flushed by a caregiver (non-healthcare professional) at home.

This trial program ran between April and August 2008, and aimed to determine if the expressed concerns related to the potential for increased infection or occlusion rates were justified.

The results showed that there was no increase in the incidence of catheter occlusions and infection in those patients whose devices were discontinued at home. Moreover, patients identified the following as key advantages of the home DC process: less travel time, increased independence, increased self control and patient's energy savings. They also appreciated feeling less of a "burden", and being able to maintain a normal "worklife". They did not express being worried or concerned about the discontinuation process. All stated they would participate in the project again.

This step also resulted in greater flexibility of treatment start dates as patients did not need to return to the clinic for DC on a weekday.

### **Conclusion:**

Infusional chemotherapy treatments can be safely discontinued at home by the patient or a caregiver provided the following key elements are in place:

- Thorough assessment process to determine if patient/caregiver is able to perform the procedure at home.
- System to provide necessary supplies for the procedure.
- System to order and dispense prescription medication (heparin) to patient.
- Scheduled session to teach caregiver to perform procedure.
- Backup system to support caregivers/patients experiencing difficulties with the procedure or device at home.

Full details of this Home DC process are described at: [www.bccancer.bc.ca/HPI/Nursing/whatsnew](http://www.bccancer.bc.ca/HPI/Nursing/whatsnew).

Specific information is also available on the BCCA website for discontinuation of INFUSOR™ from:

- implanted venous access device ([www.bccancer.bc.ca/HPI/DrugDatabase/DrugIndexPt/INFUSOR™++IVAD](http://www.bccancer.bc.ca/HPI/DrugDatabase/DrugIndexPt/INFUSOR™++IVAD))
- peripherally inserted central catheter ([www.bccancer.bc.ca/HPI/DrugDatabase/DrugIndexPt/INFUSOR™+-+PICC+line](http://www.bccancer.bc.ca/HPI/DrugDatabase/DrugIndexPt/INFUSOR™+-+PICC+line))

For more information please contact [joliver@bccancer.bc.ca](mailto:joliver@bccancer.bc.ca).

### **MEDICATION SAFETY – ASCO/ONS CHEMOTHERAPY ADMINISTRATION SAFETY STANDARDS**

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The American Society of Clinical Oncology (ASCO) and the Oncology Nursing society (ONS) have published in 2009 the joint safety standards for chemotherapy administration to adult patients in an ambulatory setting ([www.ASCO.org/safety](http://www.ASCO.org/safety)). These standards are based on literature review and consensus from a multidisciplinary working group consisting of 40 oncology professionals (physicians, nurses, pharmacists, social workers, patient advocates). Thirty-one comprehensive standards were developed addressing topics such as:

- review of clinical information and selection of a treatment regimen
- treatment planning and informed consent
- ordering of treatment
- drug preparation
- assessment of treatment compliance
- administration and monitoring of chemotherapy
- assessment of response and toxicity.

Although these standards share some similarities with the BCCA policy on delivery process of systemic therapy (Policy III-10), they are not identical. The BCCA policy provides guidance for physicians, nurses

and pharmacists involved in the delivery of systemic therapy of cancer patients in BC. Therefore, it is specific for the care setting in BC and forms the basis for the BCCA educational resources, including the Pharmacy Guide to BCCA Chemotherapy Protocols, the BCCA Nursing Certification and the training programs for general practitioners in oncology (GPO).

Submitted by:

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## FOCUS ON – ADJUSTING CHEMOTHERAPY DOSE FOR RENAL AND HEPATIC DYSFUNCTION

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Chemotherapy may cause toxicity via two mechanisms when administered to patients with renal or hepatic dysfunction. Firstly, the drugs may be nephrotoxic (e.g., cisplatin) or hepatotoxic (e.g., mercaptopurine), therefore causing further damage to the kidneys or liver. Secondly, drugs may cause increased toxicity due to decreased elimination by the kidneys or liver.<sup>1</sup> Since clinical trials usually exclude patients with organ dysfunction, dosing recommendations in this setting are largely empiric. Also, many of these recommendations were derived from clinical data in the era before the widespread use of colony-stimulating factors.

Many empiric dose reductions are based on laboratory parameters with limited ability to reflect true organ function. For example, there is limited accuracy in estimating renal function based on serum creatinine, blood urea nitrogen (BUN), or creatinine clearance (CrCl) calculated from serum creatinine. Nuclear renogram provides a more accurate estimation of renal function.<sup>3</sup> Similarly, there are no readily available laboratory tests to quantitatively measure liver function.<sup>2</sup> Estimation of hepatic injury is used to indirectly estimate function of the liver, based on tests such as total serum bilirubin, aspartate aminotransferase (AST) and alanine aminotransferase (ALT). However, the correlation between hepatic injury and dysfunction may be limited.<sup>1</sup> Also, since baseline laboratory values may not reflect true organ function, changes in laboratory values may help to guide individualized dosage adjustments in subsequent chemotherapy cycles.

Because of the limitations of these tests and the sparse evidence obtained from patients with organ dysfunction, patient-specific parameters should be considered when determining chemotherapy doses. For example, full dose may be considered with curative chemotherapy<sup>1</sup> while dose reductions are more likely with palliative treatment. Full dose chemotherapy may also be considered when the particular organ dysfunction is due to metastases. Alternatively, colony stimulating factors may decrease the need for dose reductions due to hematological toxicities and avoid undertreatment of the cancer.

### Internet Resources

In addition to the BCCA Cancer Drug Manual® monographs, several internet resources and articles are available to help determine if dose reductions are necessary for organ dysfunction. Note that conversion factors from the American system to SI units<sup>4</sup> may be necessary in interpreting laboratory values (<http://content.nejm.org/cgi/content/full/351/15/1548/DC1>):

### *Dose modifications in renal dysfunction or hemodialysis*

- ChemoOrders.com Methodology ([www.chemoorders.com/methodology.aspx](http://www.chemoorders.com/methodology.aspx))
- Janus N et al. Proposal for dosage adjustment and timing of chemotherapy in hemodialyzed patients Ann Oncol 2010;21:1395-403 (<http://annonc.oxfordjournals.org/content/21/7/1395.full?sid=fa068e3d-c83e-4354-ba22-f98724ab4f2c>)

*Dose modifications in hepatic dysfunction*

- Eklund JW et al. Chemotherapy dosing in the setting of liver dysfunction. *Oncology* 2005;19:1057-63; discussion 1063-4, 1069. ([www.cancernetwork.com/display/article/10165/106688](http://www.cancernetwork.com/display/article/10165/106688))
- ChemoOrders.com Methodology ([www.chemoorders.com/methodology.aspx](http://www.chemoorders.com/methodology.aspx))
- Field KM et al. Part I: Liver function in oncology: biochemistry and beyond. *Lancet Oncol* 2008;9:1092–01.
- Field KM et al. Part II: Liver function in oncology: towards safer chemotherapy use. *Lancet Oncol* 2008;9:1181–90.
- Ramachandran R et al. Histological patterns in drug-induced liver disease. *J Clin Pathol* 2009;62:481-92 (<http://jcp.bmjournals.com/content/62/6/481.full>)

*Laboratory tests and interpretation*

- <http://www.labtestsonline.org/understanding/index.html>

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**References**

1. Superfin D, Iannucci AA, Davies AM. Commentary: Oncologic drugs in patients with organ dysfunction: a summary. *Oncologist* 2007;12(9):1070-83.
2. King PD, Perry MC. Hepatotoxicity of chemotherapy. *Oncologist* 2001;6(2):162-76.
3. Moore M. Glomerular Filtration Rate (GFR) - By Renogram, Cockcroft-Gault or MDRD? BC Cancer Agency Systemic Therapy Update 2005 November;8(11):1-2.
4. McQueen M. Laboratory Reference Intervals: SI and Traditional Units. *Compendium of Pharmaceuticals and Specialties (CPS)*; 2009.

**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, revised or deleted protocols, PPPOs and patient handouts for this month are listed below. Protocol codes for treatments requiring “Compassionate Access Program” (previously Undesignated Indications Request) approval are prefixed with the letter **U**.

**NEW PROTOCOLS, PPPOs AND PATIENT HANDOUTS (AFFECTED DOCUMENTS ARE CHECKED):**

CODE	Protocol	PPPO	Patient Handout	Protocol Title
HNNAVP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Palliative Chemotherapy for Advanced Head and Neck Nasopharyngeal Carcinoma with Weekly Cisplatin

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

CODE	Protocol	PPPO	Patient Handout	Changes	Protocol Title
BRAJDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Eligibility clarified</i>	Adjuvant Therapy for Breast Cancer Using Docetaxel and Cyclophosphamide

CODE	Protocol	PPPO	Patient Handout	Changes	Protocol Title
GOENDCAD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>Minor typo corrected</i>	Treatment of Primarily Advanced or Recurrent Endometrial Cancer using Carboplatin and Docetaxel
UGUTEM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Dose medications clarified</i>	Therapy for Advanced Renal Cancer Using Temsirolimus
UHNAVPD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>Diluent volume for docetaxel clarified</i>	Treatment of Recurrent or Metastatic Squamous Cell Carcinoma of the Head and Neck with Cisplatin and Docetaxel
HNLAPRT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Eligibility clarified</i>	Combined Chemotherapy Cisplatin and Radiation Treatment for Locally Advanced Squamous Cell Carcinoma of the Head and Neck
ULKMSA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Precautions clarified</i>	Therapy of Myelodysplastic Syndrome using Azacitidine
LUFLUDR	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>Revised to be consistent with LYFLU and other rituximab PPPOs</i>	Treatment of Chronic Lymphocytic Leukemia or Polymphocytic Leukemia with Fludarabine and Rituximab
LYCARTOP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>Minor typo corrected</i>	Topical Carmustine (BCNU, BiCNU®) in Cutaneous T-cell Lymphoma
LYFLUDR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Minor typo corrected</i>	Treatment of Chronic Lymphocytic Leukemia or Polymphocytic Leukemia with Fludarabine and Rituximab
LYGDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>Premedications clarified, PPPO reformatted</i>	Treatment of Lymphoma with Gemcitabine, Dexamethasone and Cisplatin (GDP)
LYHDMRP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Neutropenia precaution added</i>	Treatment of Primary Intracerebral Lymphoma with High Dose Methotrexate and Rituximab
LYRITUX	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Neutropenia precaution revised</i>	Treatment of Lymphoma with Single Agent Rituximab
LYRITZ	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Neutropenia precaution revised</i>	Palliative Therapy For Lymphoma Using Radioimmunotherapy: Rituximab-Priming for Ibritumomab <sup>90</sup> Y (ZEVALIN®)
ULYRMTN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Neutropenia precaution added</i>	Maintenance Rituximab for Indolent Lymphoma
SMAJIFN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>Hydration rate revised</i>	Adjuvant Therapy of High Risk Malignant Melanoma with High Dose Interferon (HDIFN) Alfa-2b

**Information for INFUSOR™ discontinuation** has also been posted on the webpage of all protocols with fluorouracil given via infusional device.

## WEBSITE RESOURCES AND CONTACT INFORMATION

WEBSITE RESOURCES	<a href="http://www.bccancer.bc.ca">www.bccancer.bc.ca</a>
REIMBURSEMENT AND FORMS: BENEFIT DRUG LIST, CLASS II, BC CANCER AGENCY COMPASSIONATE ACCESS PROGRAM	<a href="http://www.bccancer.bc.ca/HPI/ChemotherapyProtocols/Forms">www.bccancer.bc.ca/HPI/ChemotherapyProtocols/Forms</a>
CANCER DRUG MANUAL	<a href="http://www.bccancer.bc.ca/cdm">www.bccancer.bc.ca/cdm</a>
CANCER MANAGEMENT GUIDELINES	<a href="http://www.bccancer.bc.ca/CaMgmtGuidelines">www.bccancer.bc.ca/CaMgmtGuidelines</a>
CANCER CHEMOTHERAPY PROTOCOLS, PRE-PRINTED ORDERS, PROTOCOL PATIENT HANDOUTS	<a href="http://www.bccancer.bc.ca/ChemoProtocols">www.bccancer.bc.ca/ChemoProtocols</a>
SYSTEMIC THERAPY PROGRAM POLICIES	<a href="http://www.bccancer.bc.ca/HPI/ChemotherapyProtocols/Policies">www.bccancer.bc.ca/HPI/ChemotherapyProtocols/Policies</a>
SYSTEMIC THERAPY UPDATE	<a href="http://www.bccancer.bc.ca/HPI/ChemotherapyProtocols/stupdate">www.bccancer.bc.ca/HPI/ChemotherapyProtocols/stupdate</a>

CONTACT INFORMATION	<a href="http://www.bccancer.bc.ca">www.bccancer.bc.ca</a>	<a href="mailto:bulletin@bccancer.bc.ca">bulletin@bccancer.bc.ca</a>
BC CANCER AGENCY .....	(604) 877-6000 .....	Toll-Free 1-(800) 663-3333
PROVINCIAL SYSTEMIC THERAPY PROGRAM .....	Ext 2247 .....	<a href="mailto:mclin@bccancer.bc.ca">mclin@bccancer.bc.ca</a>
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EDUCATION RESOURCE NURSE .....	Ext 2638 .....	<a href="mailto:nursinged@bccancer.bc.ca">nursinged@bccancer.bc.ca</a>
NURSING PROFESSIONAL PRACTICE .....	Ext 2623 .....	<a href="mailto:ilundie@bccancer.bc.ca">ilundie@bccancer.bc.ca</a>
LIBRARY/CANCER INFORMATION.....	1-(888)-675-8001.....	<a href="mailto:requests@bccancer.bc.ca">requests@bccancer.bc.ca</a>
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VANCOUVER CENTRE (VCC).....	(604) 877-6000 .....	Toll-Free 1-(800) 663-3333
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