



The Canadian Association of Pharmacy in Oncology presents

***DO SOMETHING ASTONISHING***

CAPhO Conference 2017

L'Association canadienne de pharmacie en oncologie présente

***RÉALISER L'INIMAGINABLE***

Congrès de l'ACPhO 2017

The word 'Banff' is written in a large, elegant, white script font, with a subtle shadow effect. It is positioned over a background image of a mountain lake and forest. Below the word, the year '2017' is written in a large, bold, green sans-serif font.

**2017**

April 20 - 23 | Du 20 au 23 avril  
The Fairmont Banff Springs Hotel, Banff, Alberta

Program and Poster Abstracts  
Programme et affiches des abrégés

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View the session descriptions, speaker biographies, general information and more on the **CAPhO Conference 2017 App**, available for iPhone and Android users. Search **CAPhO 2017** to download the app.



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# Satellite Symposium

Roche

## HER2+ Early Breast Cancer Therapy: Good, Better, Best - Never Let it Rest!

**Friday, April 21 – 3:45-5:15 p.m.**

**Cascade Room, The Fairmont Banff Springs**

### Speakers:

**Dr. Anil Abraham Joy** MD, FRCPC

Professor, Department of Oncology, Division of Medical Oncology, University of Alberta  
Medical Oncologist, Cross Cancer Institute, Edmonton, Alberta, Canada

**Colleen Olson** BA, BSP

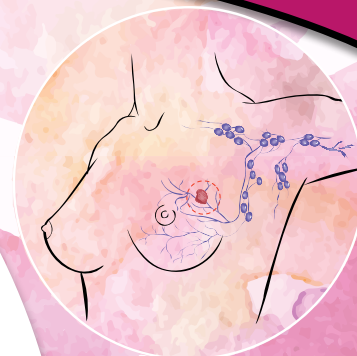
Senior Oncology Pharmacist, Saskatoon Cancer Centre

### Description:

Breast cancer remains the most commonly diagnosed cancer in women and is the leading cause of cancer-related deaths. Despite current advances in HER2-positive early breast cancer treatments, up to one in three women with HER2-positive early breast cancer will develop metastatic disease. This session will focus on the evolution of HER2-targeted therapies in early breast cancer and the potential role of novel agents in HER2-positive breast cancer from the perspective of a multi-disciplinary team.

### Learning Objectives:

1. Review the historical outcomes in the pre-trastuzumab era, the trastuzumab revolution and optimization of trastuzumab therapy
2. Examine the role of novel agents/therapeutic strategies in early HER2-positive breast cancer
3. Understand the mechanism of action, common toxicities, and pharmacy consideration in administration of HER-targeted therapies
4. Discuss the role of pharmacists in early breast cancer patient practice



**CAPhO Conference 2017**

**Canadian Association of Pharmacy in Oncology  
April 20 – 23, 2017**

**The Fairmont Banff Springs Hotel, Banff, Alberta**

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## Welcome Message from the CAPhO President

Welcome to Banff and CAPhO Conference 2017!

***Do Something Astonishing*** is this year's theme, which is a standing request from one of our pillars of oncology pharmacy, the late, great Larry Broadfield. This message serves not just as the flavour of our Conference, but also as a reminder for us not only professionals, but as people, to push ourselves to contribute at least one thing of singular worth to oncology pharmacy and that of our patients.

The world we know as oncology pharmacy is continuing to see positive shifts and evolution in new and unique ways. Whether it is the persistent tidal wave of oral anti-cancer medications that we are using and clinically managing, to the mounting revolutionary effects of immunotherapies juxtaposed with their potential impact on the health care system and patient access, or the changing educational and experiential landscape of our new practitioners; ultimately, we should have ample opportunity to do something astonishing.

One way this process could begin, is by becoming involved in our association. Attend the CAPhO Annual General Meeting to learn about progress on the Strategic Plan (Saturday at noon), the CAPhO Booth throughout the Conference, and our Town Hall Breakfast Meeting on Sunday morning at 8:30 am for discussion and opportunities to get involved.

There are a number of social events that serve not only as an enjoyable opportunity to meet new colleagues, discuss current challenges, and reconnect with friends. These begin on Friday evening at 5:15 pm at the Welcome Reception where there is an opportunity to speak with the CAPhO Conference exhibitors and view the research posters. Saturday is bookended in the morning with an energizing 30 minute yoga session beginning at 6 am and at 7 pm by our annual Evening Social Event in the Banff Springs Hotel.

We would like to express a heartfelt thank you to our generous sponsors for their ongoing support of this important Conference. We encourage you to visit the exhibits and speak with the sponsor representatives who can inform you of new products and services that may be helpful to your patients.

Kim Defoe, our 2017 CAPhO Conference Chair, and the Planning Committee have created a tremendous program through much committed time and effort for which we are very truly appreciative. Please take an opportunity to thank Kim and the Committee members when you see them during the Conference.

On behalf of the CAPhO Executive, we hope you enjoy CAPhO Conference 2017!



**Mark Pasetka**  
CAPhO President





## Mot de bienvenue du président de l'ACPhO

Bienvenue à Banff et au Congrès de l'ACPhO 2017!

Le thème de cette année est *Réaliser l'inimaginable*, en écho aux demandes répétées de l'un des piliers de la pharmaco-oncologie, feu Larry Broadfield. Ce message donne non seulement le ton à notre congrès, mais il nous rappelle aussi qu'en tant que professionnels et citoyens, nous devons contribuer activement, dans une mesure ou une autre, à la réalisation d'actions concrètes qui profiteront à notre profession et à nos patients.

Le milieu de la pharmaco-oncologie tel que nous le connaissons continue d'évoluer positivement de façon unique et novatrice. Qu'il s'agisse de la vague de nouveaux médicaments contre le cancer que nous utilisons et gérons cliniquement, de l'augmentation de l'efficacité des immunothérapies et de leur impact possible sur le système de soins de santé et l'accessibilité aux patients, ou du contexte changeant de notre pratique sur les plans de l'apprentissage et de l'expérience, nous avons amplement d'occasions de changer le cours des choses.

Votre participation aux activités de notre association constitue un bon point de départ. Vous pourriez notamment assister à l'assemblée générale annuelle de l'ACPhO (samedi à midi), visiter le stand de l'ACPhO pendant le congrès et participer à notre petit-déjeuner-causerie le dimanche matin à 8 h 30 pour prendre part à une discussion ouverte et découvrir différentes façons de vous impliquer.

De nombreuses activités sociales sont prévues au programme. Il s'agit d'excellentes occasions de rencontrer de nouveaux collègues, de discuter des enjeux actuels et de renouer avec des amis. La réception d'accueil ouvrira la marche le vendredi soir à 17 h 15. Vous pourrez à ce moment échanger avec les exposants du congrès et visionner les affiches de recherche. Le samedi, la journée commencera à 6 h par une séance de yoga énergisante de 30 minutes et se terminera à 19 h par notre soirée de gala à l'hôtel Banff Springs.

Nous tenons à remercier du fond du cœur nos généreux commanditaires pour leur appui soutenu à cet important congrès. Nous vous invitons à visiter leurs stands d'exposition et à parler avec leurs représentants pour en apprendre plus sur leurs nouveaux produits et services qui pourraient profiter à vos patients.

La présidente du Congrès de l'ACPhO 2017, Kim Defoe, ainsi que les membres du comité de planification ont mis sur pied un programme du tonnerre, fruit de beaucoup de temps et d'efforts. Nous leur en sommes très reconnaissants. Prenez le temps de remercier chacun d'eux quand vous les croiserez au congrès.

Au nom de la direction de l'ACPhO, je vous souhaite un très bon Congrès de l'ACPhO 2017!



**Mark Pasetka**  
Président de l'ACPhO







## Welcome Message from the Conference Chair

It is my pleasure to welcome you to the CAPHO Conference 2017 in the stunning backdrop of Banff. This educational event for oncology pharmacy practitioners takes us around the country annually for three days of learning, networking and enjoying different locales with colleagues and friends.

The CAPHO 2017 Planning Committee has worked hard on the program to develop sessions that are relevant, interesting and innovative to meet the needs of all practitioners, whether you have been practicing in oncology pharmacy for a couple of years or decades.

Our theme ***Do Something Astonishing*** is a call to action for us to strive to make the greatest impact we can on our patients and colleagues through our practice. Beginning with the opening plenary, there is a lineup of stimulating topics carefully selected to enhance our knowledge and ability to accomplish our own “moments of greatness within our profession”.

We are lucky enough to have the picturesque Canadian Rocky Mountains and the stunning Fairmont Banff Springs hotel as the background for this Conference. You will be able to enjoy peacefulness of the scenery and distinctive amenities of the Conference venue and we invite you to extend your stay and partake in the many other sightseeing opportunities that the Banff Region has to offer.

On behalf of the Planning Committee, we wish to acknowledge all the presenters for their time and effort, and our industry partners for their educational contribution and continued support.

It has been a great privilege for me to serve as the CAPHO 2017 Conference Chair, an impossible endeavor without the help from the members of the Planning Committee and the CAPHO Executive.

I hope that you find the Conference both inspiring and enjoyable, leaving Banff with new knowledge, a greater perspective and fond memories.

**Kimberly Defoe**  
CAPHO Conference 2017 Chair





## Mot de bienvenue de la présidente du Congrès

Je suis heureuse de vous accueillir au Congrès de l'ACPhO 2017 dans le magnifique décor de Banff. Destiné aux praticiens de pharmacologie, cet événement éducatif de trois jours mettant à l'honneur l'apprentissage, le réseautage et les activités sociales entre collègues et amis a lieu chaque année dans une région différente du pays.

Le comité de planification du congrès a travaillé fort pour mettre sur pied un programme pertinent, intéressant et avant-gardiste adapté aux besoins de tous les praticiens, débutants comme chevronnés.

Notre thème, *Réaliser l'inimaginable*, se veut un appel à l'action afin d'obtenir des résultats concrets auprès de nos patients et collègues dans le cadre de notre pratique. Dès la séance plénière d'ouverture, le programme propose des thèmes stimulants soigneusement choisis pour approfondir nos connaissances et améliorer notre capacité à avoir nos propres « moments de grandeur » dans notre profession.

Les majestueuses montagnes Rocheuses et le superbe hôtel Fairmont Banff Springs constituent la toile de fond parfaite pour l'occasion. Vous pourrez profiter de la tranquillité du paysage et des installations uniques du lieu du congrès. Je vous invite d'ailleurs à prolonger votre séjour et à participer aux nombreuses activités touristiques proposées dans la région de Banff.

Au nom du comité de planification, je tiens à remercier tous les présentateurs pour le temps et les efforts qu'ils ont consacrés au congrès, ainsi que nos partenaires sectoriels pour leur contribution au programme et leur appui soutenu.

C'est pour moi un grand privilège de servir à titre de présidente du Congrès de l'ACPhO 2017, événement qui n'aurait su voir le jour sans l'aide des membres du comité de planification et de la direction de l'ACPhO.

J'espère que ce congrès s'avérera à la fois inspirant et instructif et que vous quitterez Banff avec un bagage de nouvelles connaissances, une perspective plus vaste et des souvenirs inoubliables.

**Kimberly Defoe**  
Présidente du Congrès de l'ACPhO 2017





# How would you manage this patient's risk of chemotherapy-induced FN?

When FN risk is  $\geq 20\%$ , G-CSF use in primary prophylaxis is supported by ASCO, EORTC and NCCN guidelines.<sup>2,3,4</sup>



**Neulasta®**  
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Once per cycle of chemotherapy<sup>\*,1</sup>

#### **Indication and clinical use:**

- NEULASTA® is indicated to decrease the incidence of infection, as manifested by febrile neutropenia, in patients with non-myeloid malignancies receiving myelosuppressive anti-neoplastic drugs
- Safety and effectiveness in pediatric patients (< 18 years of age) have not been established

#### **Contraindications:**

- Known hypersensitivity to *E. coli*-derived proteins or filgrastim

#### **Most serious warnings and precautions:**

- **Splenic rupture:** including fatal cases
- **Severe sickle cell crises:** associated with use in patients with sickle cell trait or sickle cell disease and, in some cases, resulting in death

#### **Other relevant warnings and precautions:**

- Should not be used for peripheral blood progenitor cell (PBPC) mobilization
- Caution against concurrent administration with cytotoxic chemotherapy; should also not be administered in the period between 14 days before and 24 hours after administration of cytotoxic chemotherapy
- Not studied in patients receiving chemotherapy associated with delayed myelosuppression, mitomycin C, myelosuppressive doses of anti-metabolites, or radiation
- Potential to act as a tumour growth factor
- Hypersensitivity
- Cutaneous vasculitis
- Leukocytosis (monitoring recommended)
- Acute respiratory distress syndrome
- Capillary leak syndrome

- Glomerulonephritis (urinalysis monitoring recommended)
- Not recommended in pregnant or nursing women
- A complete blood count (CBC) and platelet count should be performed prior to administration of chemotherapy
- Regular monitoring of hematocrit value, white blood cell count and platelet count is recommended

#### **For more information:**

Please consult the Product Monograph at [http://www.amgen.ca/Neulasta\\_PM.pdf](http://www.amgen.ca/Neulasta_PM.pdf) for important information relating to adverse reactions, drug interactions, and dosing information that have not been discussed in this piece.

The Product Monograph is also available by calling 1-866-502-6436.

ASCO: American Society of Clinical Oncology; EORTC: European Organization for Research and Treatment of Cancer; FN: Febrile Neutropenia; G-CSF: Granulocyte Colony-Stimulating Factor; NCCN: National Comprehensive Cancer Network.

\*Neulasta® should be administered no sooner than 24 hours after the administration of cytotoxic chemotherapy and no less than 14 days before subsequent administration of chemotherapy.

1. Neulasta® (pegfilgrastim) Product Monograph. Amgen Inc. May 25, 2015.

2. Crawford J, et al. NCCN Clinical Practice Guidelines in Oncology® Myeloid Growth Factors.V.2.2016.

3. Smith TJ, et al. Recommendations for the Use of WBC Growth Factors: American Society of Clinical Oncology Clinical Practice Guideline Update. *J Clin Oncol*. 2015; 33:3199-3212.

4. Aapro MS, et al. EORTC guidelines for the use of granulocyte colony-stimulating factor to reduce the incidence of chemotherapy-induced febrile neutropenia in adult patients with lymphomas and solid tumours. *EJC* 2011;47:8-32.



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## Recognition of the CAPhO 2017 Planning Committee, CAPhO Awards Committee and Volunteers

Thank you to the **CAPhO 2017 Planning Committee** members for their work in planning this Conference and to the **CAPhO Awards Committee** for their time reviewing the abstracts. We would also like to thank those who have volunteered their time to assist the CAPhO 2017 participants and organizers onsite. We really appreciate the assistance you provide to ensure participants have everything they need to participate effectively in the Conference.

Canadian Association  
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## Program at a Glance

This program is interactive, click on session titles to jump to the detailed program and find out more about your selected session.

### Thursday, April 20

18:30-20:00

**Satellite Symposium – Pfizer Injectables** *(Cascade Ballroom)*

**The Use of LMWH in Renally Impaired Patients with Cancer**

Wendy Lim, *McMaster University, Hamilton, ON*

### Friday, April 21

07:00-08:30

**Satellite Symposium – Apobiologix** *(Cascade Ballroom)*

**How to Maximize the Value of Biosimilars in Canada?**

Kathy Gesy, *Saskatchewan Cancer Agency, Saskatoon, SK*  
Pedro Gascon, *Barcelona University Medical School, Barcelona, Spain*

08:45-10:15

**Satellite Symposium – Amgen** *(Alhambra Room)*

**Advances in the Treatment of Metastatic Colorectal Cancer and the Role of Multidisciplinary Management in Optimizing Patient Outcomes**

Tom McFarlane, *University of Waterloo, Kitchener, ON*  
Oliver F. Bathe, *Tom Baker Cancer Centre, Calgary, AB*  
Scot Dowden, *Tom Baker Cancer Centre, Calgary, AB*

10:30-12:00

**Satellite Symposium – Amgen** *(Alhambra Room)*

**Biosimilars in Oncology: From Cell Cultures to Clinical Considerations**

Michael Leblanc, *The Moncton Hospital, Moncton, NB*  
Annick Dufour, *Réseau Cancer Montréal, Montreal, QC*  
Sandy Sehdev, *The Ottawa Hospital Cancer Centre, Ottawa, ON*

12:15-13:45

**Satellite Symposium – Merck** *(Cascade Ballroom)*

**The Pharmacist and Immune Checkpoint Inhibition: Looking to the Future**

Scott Edwards, *Dr. H. Bliss Murphy Cancer Centre, St. John's, NL*  
Sean Hopkins, *Simcoe Muskoka Regional Cancer Program, Barrie, ON*

THURSDAY

FRIDAY





14:00-15:30

**Satellite Symposium – Pfizer Oncology** *(Alhambra Room)*

**The Evolving Landscape of Patient Management in Hormone Positive Breast Cancer**

Karen Gelmon, *Vancouver Centre, BCCA, Vancouver, BC*

15:45-17:15

**Satellite Symposium – Hoffmann-La Roche** *(Cascade Ballroom)*

**HER2+ Early Breast Cancer Therapy: Good, Better, Best - Never Let it Rest!**

Anil Abraham, *University of Alberta, Edmonton, AB*

Colleen Olson, *Saskatoon Cancer Centre, Saskatoon, SK*

17:15-19:00

**Welcome Reception – Exhibits and Posters Viewing** *(Alberta and New Brunswick Rooms)*

**Saturday, April 22**

06:00-06:30

**Yoga Session** *(Ivor Petrak Room)*

07:00-08:30

**Satellite Symposium – Pfizer Injectables** *(Alhambra Room)*

**A Review of Canadian and US Pharmacy Standards for Handling Hazardous Drugs**

Eric Kastango, *Clinical IQ LLC, Florham Park, USA*

08:00-08:45

**Breakfast amongst the Exhibits and Posters** *(Alberta and New Brunswick Rooms)*

08:45-09:00

**Welcome Remarks** *(Cascade Ballroom)*

Mark Pasetka, *CAPHO President, Sunnybrook Health Sciences Centre, Odette Cancer Centre, Toronto, ON*

Kimberly Defoe, *Conference Chair, Alberta Health Services, Calgary, AB*

09:00-09:45

**Plenary** *(Cascade Ballroom)*

**Winning a Tickle Fight**

Mike Lang, *CancerControl Alberta and Alberta Health Services, Calgary, AB*

FRIDAY

SATURDAY



09:45-10:30

**Plenary** (Cascade Ballroom)

**A Diagnosis of Childhood Cancer Lasts a Lifetime**

Greg Guilcher, *University of Calgary/Alberta Children's Hospital, Calgary, AB*

10:30-11:10

**Refreshment Break amongst the Exhibits and Posters** (Alberta and New Brunswick Rooms)

11:10-11:55

**Plenary** (Cascade Ballroom)

**Medically Assisted Dying**

Patrick Mayo, *University of Alberta Hospital, Edmonton, AB*

12:00-12:45

**CAPhO Annual General Meeting** (Cascade Ballroom)

12:45-13:45

**Networking Lunch amongst the Exhibits and Posters** (Alberta and New Brunswick Rooms)

13:45-14:45

**Plenary** (Cascade Ballroom)

**Rx Drugs in the 21<sup>st</sup> Century: Prices, Access and Regulation in an Era of Unsustainable Costs**

Marc-André Gagnon, *Carleton University's School of Public Policy and Administration, Ottawa, ON*

14:45-15:25

**Concurrent Sessions 1**

**Administrative Stream** (Alhambra Room)

**Exploring a Collaborative National Process to Co-create Consensus Clinical Pharmacy Key Performance Indicators for Ambulatory Oncology Pharmacists**

Olavo Fernandes, *University Health Network, Toronto, ON*

**Clinical Stream** (Cascade Ballroom)

**A Science-Based Look at "Integrative Oncology"**

Scott Gavura, *Cancer Care Ontario, Toronto, ON*

SATURDAY





**Research Stream** (*Oak Room, Mezzanine 1 Level*)

**Deciphering the Alphabet Soup of Survival Analysis: DFS, PFS, OS, KM, HR and CI**

Lauren Bresee, *Canadian Agency for Drugs and Technologies in Health (CADTH) and University of Calgary, Calgary, AB*

**Technician Stream** (*Ivor Petrak Room*)

**Psychological Safety: Speaking up for Patient Safety**

Terry Ell, *Alberta Health Services, Calgary, AB*  
Gina Lachuk, *Alberta Health Services, Calgary, AB*

**15:25-16:05**

**Refreshment Break amongst the Exhibits and Posters** (*Alberta and New Brunswick Rooms*)

**16:05-16:45**

**Concurrent Sessions 2**

**Administrative Stream** (*Alhambra Room*)

**Defining Canadian Certification for Oncology Pharmacists**

Flay Charbonneau, *Sunnybrook Health Sciences Centre, Odette Cancer Centre Pharmacy, Toronto, ON*  
Mark Pasetka, *Sunnybrook Health Sciences Centre, Odette Cancer Centre, Toronto, ON*

**Clinical Stream** (*Cascade Ballroom*)

**Chemotherapy-Related Cardiac Dysfunction & How a Cardio-Oncology Clinic Can Help!**

Maria Anwar, *Alberta Health Services, South Health Campus, Calgary, AB*

**Clinical Stream** (*Oak Room, Mezzanine 1 Level*)

**Practice Changing Articles in Neuro Oncology in 2016/17**

Frances Cusano, *Tom Baker Cancer Centre, Calgary, AB*

**Technician Stream** (*Ivor Petrak Room*)

**Technicians Checking Chemotherapy: How Do We Get There?**

Robin Burns, *Cancer Network for CancerControl Alberta Pharmacy, Edmonton, AB*

**19:00-00:00**

**Dinner Event** (*Cascade Ballroom*)

SATURDAY



Sunday, April 23

07:00-08:30

**Satellite Symposium – Astellas** *(Alhambra Room)*

**Wake Up: Get a Move on Managing Fatigue in Oncology Patients and Recognizing the Pharmacist's Role**

Naveen Basappa, *Cross Cancer Institute, Edmonton, AB*

Kerry S. Courneya, *University of Alberta, Edmonton, AB*

Khristine Wilson, *Allan Blair Cancer Centre, Regina, SK*

08:30-09:15

**CAPhO Town Hall Breakfast Meeting** *(Cascade Ballroom)*

CAPhO Executive Committee

09:15-09:45

**Oral Sessions: Award Winning Posters** *(Cascade Ballroom)*

Chair: Coleen Schroeder, *Awards Committee Chair, McGill University Health Centre, Montreal, QC*

09:45-10:30

**Hot Topic Discussions**

**1. Chemotherapy Dosing in Obesity** *(New Brunswick Room)*

Frances Cusano, *Tom Baker Cancer Centre, Calgary, AB*

**2. Demystifying Opioid Rotation Calculations** *(New Brunswick Room)*

Chris Ralph, *Tom Baker Cancer Centre, Calgary, AB*

**3. Establishing an Oral Chemotherapy Program, a Technician Perspective** *(New Brunswick Room)*

Susan Singh, *Sunnybrook Health Sciences Centre, Odette Cancer Centre, Toronto, ON*

**4. Communication Strategies for Precepting – Providing Feedback to Optimize Learning and Professional Socialization** *(New Brunswick Room)*

Tara Leslie, *Tom Baker Cancer Centre/University of Alberta, Calgary, AB*

**5. Steroid-Resistant Graft Versus Host Disease** *(Alberta Room)*

Jennifer Jupp, *Alberta Health Services, Calgary, AB*

**6. The Dirt on Environmental Monitoring - At Your Fingertips** *(Alberta Room)*

Tana Yoon, *Alberta Health Services, Calgary, AB*

**7. There's an App for That: Top 5 Apps and e-Resources for Patients** *(Alberta Room)*

Christina Mychaskiw, *Sunnybrook Health Sciences Centre, Odette Cancer Centre, Toronto, ON*

SUNDAY





## 8. There's an App for That: Top 5 Apps, Social Media, and e-Resources for Pharmacists *(Alberta Room)*

Soha Ahrari, *Princess Margaret Cancer Centre, Toronto, ON*

### Workshop *(Cascade Ballroom)*

#### Research Mentorship

Carlo DeAngelis, *Sunnybrook Health Sciences Centre, Odette Cancer Centre, Toronto, ON*

Michelle Deschamps, *Saskatchewan Cancer Agency, Saskatoon, SK*

Michelle Lui, *Hamilton Health Sciences Centre, Hamilton, ON*

Tom McFarlane, *University of Waterloo, Kitchener, ON*

10:30–10:45

### Refreshment Break *(Conservatory)*

10:45-11:30

### Panel *(Cascade Ballroom)*

#### Integrating Students into Everyday Practice: Expanding Capacity for Clinical Practice and Student Rotations

**Panellists:** Michael LeBlanc, *The Moncton Hospital, Moncton, NB*

Mark Pasetka, *Sunnybrook Health Sciences Centre, Odette Cancer Centre, Toronto, ON*

Cameron Roessner, *Foothills Medical Centre, Calgary, AB*

Ann Thompson, *University of Alberta, Edmonton, AB*

**Moderator:** Tara Leslie, *Tom Baker Cancer Centre/University of Alberta, Calgary, AB*

11:30-12:15

### Debate *(Cascade Ballroom)*

#### Physical Assessment as Part of Toxicity Management

Carlo DeAngelis, *Sunnybrook Health Sciences Centre, Odette Cancer Centre, Toronto, ON*

Scott Edwards, *Dr. H. Bliss Murphy Cancer Centre, St. John's, NL*

12:15-12:25

### Closing Remarks *(Cascade Ballroom)*

Mark Pasetka, *Sunnybrook Health Sciences Centre, Odette Cancer Centre, Toronto, ON*

Kimberly Defoe, *Conference Chair, Alberta Health Services, Calgary, AB*

12:30-14:00

### Satellite Symposium – BD Canada *(Alhambra Room)*

#### NAPRA Model Standards for Hazardous Drugs are here: Now what?

Marshall Moleschi, *Ontario College of Pharmacists, Toronto, ON*

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CAPhO 2017

## Satellite Symposium

Date:  
Saturday April 22, 2017

Time:  
7:00 - 8:30 AM

Location:  
Alhambra room  
**The Fairmont Banff Springs**  
Banff, Alberta

## A Review of Canadian and US Pharmacy Standards for Handling Hazardous Drugs

**Speaker:**

Eric S. Kastango, MBA, RPh, FASHP

**Learning Objectives :**

- Describe the current regulatory environment in the US and Canada for pharmacies/pharmacists/technicians who handle hazardous drugs
- Understand the major requirements of the USP Chapter <800>- Hazardous Drugs - Handling in the Healthcare Setting
- Understand the major requirements of the NAPRA Model Standards for Pharmacy Compounding of Hazardous Sterile Preparations
- Describe risk mitigation strategy to provide safe compounded medication while protecting healthcare workers handling hazardous drugs



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# Lundbeck en oncologie

Nous croyons en l'ouverture d'esprit face aux nouvelles connaissances. En outre, ce qui nous définit le plus est notre sens de l'humanité et la façon dont nous tendons la main à ceux qui nous entourent.

Nous avons créé une vidéo d'animation dont l'objectif est d'aider les enfants à mieux comprendre le cancer lorsqu'il survient dans leur famille et à faire face à la situation. Si vous pensez que cette vidéo pourrait être utile à votre patient, voici l'adresse URL où elle peut être visualisée: <http://www.lundbeck.com/ca/fr/les-maladies/oncologie>.



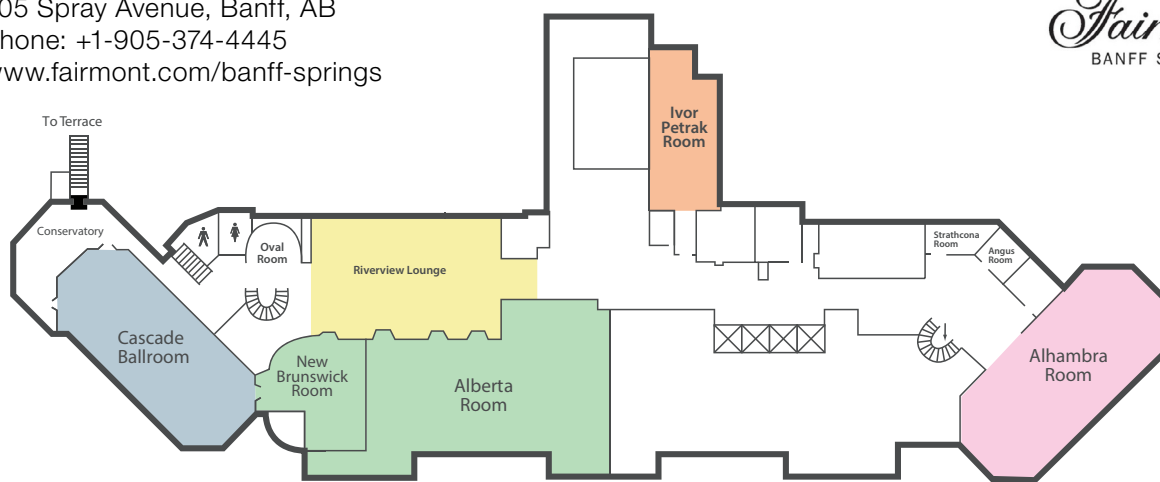
## Venue Floor Plan

### The Fairmont Banff Springs Hotel

405 Spray Avenue, Banff, AB

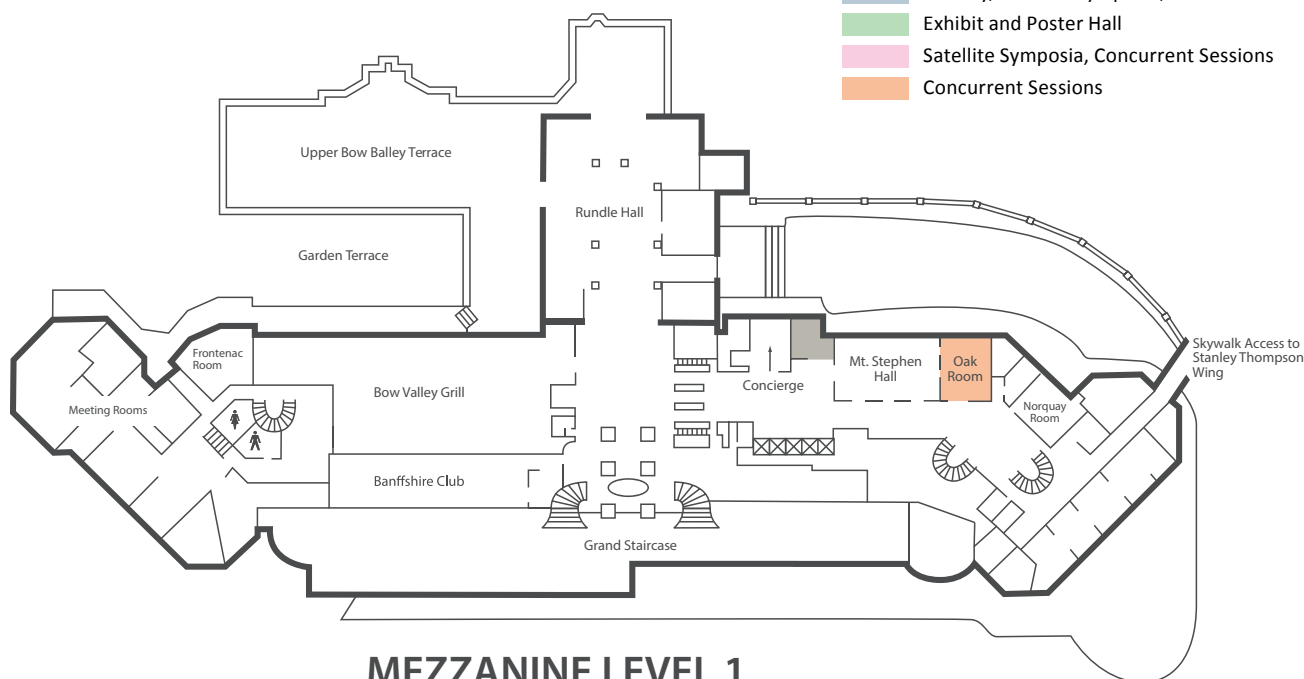
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### MEZZANINE LEVEL 2

- Registration and CAPhO Lounge
- Plenary, Satellite Symposia, Concurrent Sessions
- Exhibit and Poster Hall
- Satellite Symposia, Concurrent Sessions
- Concurrent Sessions



### MEZZANINE LEVEL 1





## Exhibits and Posters

### Opening Hours

The following events will take place in the Exhibit and Poster Hall, located in the Alberta and New Brunswick Room during the opening hours.

#### Friday, April 21, 17:15-19:00

17:15 – 19:00 Welcome Reception  
Exhibits and Posters Viewing

#### Saturday, April 22, 08:00-16:05

08:00 – 08:45 Breakfast  
10:30 – 11:10 Refreshment Break  
12:45 – 13:45 Networking Lunch  
15:25 – 16:05 Refreshment Break

### Exhibitor Listing (alphabetical by company name)

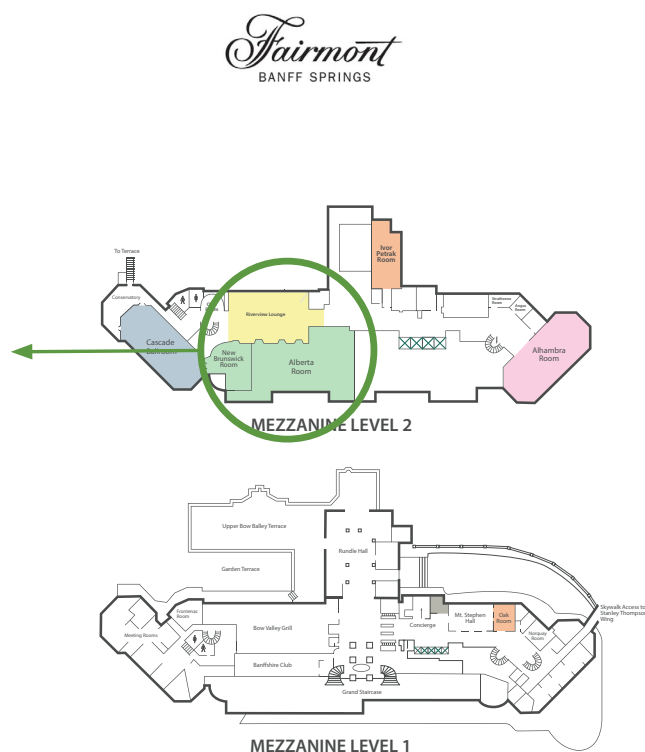
Company .....	Booth/Table #	Company .....	Booth/Table #	Company .....	Booth/Table#
AbbVie .....	T29	CAPhO .....	Foyer	Lundbeck Canada .....	10
Accord Healthcare.....	12	Celgene.....	19	Merck .....	3
Amgen .....	1 / 2	Dr. Reddy's.....	T24	North West Telepharmacy Solutions.....	T23
Apobiologix.....	14	Eisai.....	11	Novartis.....	T30
ARxIUM .....	T22	Gilead .....	T28	Pfizer Injectables .....	5 / 6
Astellas .....	8	Hoffmann-La Roche .....	9	Pfizer Oncology .....	7
AstraZeneca .....	T33	ICU Medical .....	21	Sandoz Canada.....	13
BD Canada .....	4	Innovative OncoSolutions.....	17 / 18	Seattle Genetics - Canada .....	T31
Boehringer Ingelheim .....	T32	Ipsen Biopharmaceuticals Canada.....	T25	Shire .....	T34
Bristol-Myers Squibb.....	16	Janssen .....	35	Takeda Canada .....	20
CADTH .....	T15	LEO Pharma .....	T26	Teva .....	T27



## Exhibitor Listing (numerical by booth and table number)

Company .....	Booth/Table #	Company .....	Booth/Table #	Company .....	Booth/Table#
Amgen .....	1 / 2	Sandoz Canada.....	13	North West Telepharmacy Solutions.....	T23
Merck .....	3	Apobiologix.....	14	Dr. Reddy's.....	T24
BD Canada.....	4	Bristol-Myers Squibb.....	16	Ipsen Biopharmaceuticals Canada.....	T25
Pfizer Injectables.....	5 / 6	Innovative OncoSolutions.....	17 / 18	LEO Pharma .....	T26
Pfizer Oncology.....	7	Celgene.....	19	Teva.....	T27
Astellas.....	8	Takeda Canada.....	20	Gilead .....	T28
Hoffmann-La Roche.....	9	ICU Medical .....	21	AbbVie .....	T29
Lundbeck Canada.....	10	Janssen .....	35	Novartis.....	T30
Eisai.....	11	CADTH .....	T15	Seattle Genetics - Canada .....	T31
Accord Healthcare.....	12	ARxIUM .....	T22	Boehringer Ingelheim .....	T32
				AstraZeneca .....	T33
				Shire .....	T34

## Exhibit and Poster Hall Floor Plan



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## Poster Listing

This poster listing is interactive. Click on any poster title to jump to the poster abstract.

### Administration

1. Development of an E-Learning Module For Chemotherapy Checking Certification
2. Trends in the Use and Cost of Systemic Therapy Medications at the Saskatchewan Cancer agency in 2006-2013
3. Baxter Elastomeric Pumps: Weighing as an Alternative to Visual inspection
4. Robotic Automation at Hamilton Health Sciences: i.v. Station Onco By Omnicell
5. LMWH First Dose Program to Treat Cancer-associated Thrombosis in a Pharmacy Setting
6. Remote Chemotherapy Drug Delivery Service Model
7. Learner Feedback Directs Changes to Oncology Pharmacy Education
8. Unraveling IV CQI Pump Data : Is There a Smart Way of Reducing Medication Errors?
9. Time to Clean Up! An Organization's Response to Regulatory Compounding Standards
10. The Particle Chase....A New Challenge in the Cleanroom
11. Shifting Trends: An analysis of IV and Take-home Cancer Drug Use and Public Spending in Ontario.
12. Ontario Dispensing Patterns for Publicly Funded Take-home Cancer Drugs.
13. Complying with New Provincial Regulatory Authority Requirements For Documentation and Traceability: A Technical Perspective.
14. Improving the Safe Administration of Chemotherapy to Pediatric Patients Through Standardized Pre-Printed Orders
15. Daily Chemotherapy Workload at a Regional Cancer Centre: Review of 2016
16. Establishment of a Haematological Multidisciplinary Oral Chemotherapy Clinic at a Community Hospital Leads to Decreased Emergency Department Visits
17. Transitioning Physician IV Treatment Billing from Paper to Electronic VIA Pharmacy Maintained Computerized Physician Order Entry (CPOE) System
18. Adaptation of a Hybrid Computer Prescriber Order Entry (CPOE) System in an Oncology Centre of a Multi-Site Tertiary Care Teaching Hospital

### Pharmacy Practice

19. Experiences from the Cardio-Oncology Clinic at South Health Campus in Calgary, Alberta
20. Implementation of Additional Prescribing Authorization Among Oncology Pharmacists in Alberta
21. A Multidisciplinary Team Approach to Ensuring Safe Administration of a Desensitization Protocol Involving a Cytotoxic Medication
22. Development and Implementation of an Oral Chemotherapy Pharmacy Program
23. Effects of Reducing the Urine Alkalinisation Threshold Associated with High-Dose Methotrexate Administration
24. Improving the Management of Breast Cancer in a Community Teaching Hospital: A Gap Analysis of Supports and Resources



25. Incidence of Late Onset Neutropenia Associated with Rituximab use in B Cell Lymphoma Patients Undergoing Autologous Stem Cell Transplant
26. Pediatric Chemotherapy Administered at Home: The Hospital at Home Program
27. A Retrospective Study of Symptom Burden in Patients who Received Treatment with a PD1 Inhibitor, Either Nivolumab or Pembrolizumab, at the Saskatoon Cancer Centre
28. An Oral Systemic Therapy Case Management Model
29. Validation of Best Possible Medication History: Comparison Between Telephone and in-Person Interview
30. Review of a Pharmacist-Led Telephone Follow-Up Program for Patients Receiving Chemotherapy at a Tertiary Cancer Centre
31. Evaluating the Patient-Perceived Impact of Clinical Pharmacy Services and Proactive Follow-Up Care in Ambulatory Chemotherapy Unit.

## Research

32. Impact of Genomic Analysis on Response to Therapy in Patients with Advanced Breast and Colorectal Cancers
33. Revival of HBV, HCV and Incidence of Febrile Neutropenia Associated with R-CHOP in DLBCL Treated Patients
34. Evaluation of Acute Biochemical Changes Associated with Doxorubicin, Bleomycin, Vinblastine and Dacarbazine in Hodgkin Lymphoma
35. Use of Entresto (Sacubitril/Valsartan) in Anthracycline Induced Cardiomyopathy
36. Optimisation of a Technique for Recovery of Circulating Tumour Cells from the Peripheral Blood of Colorectal and Breast Cancer Patients
37. Development of Second Primary Malignancies in Multiple Myeloma Patients Treated with Lenalidomide: An Alberta Perspective"
38. Real-World Evidence of Canadian 5-HT3 Receptor Antagonist Usage for Chemotherapy-induced Nausea and Vomiting (CINV) in 2016
39. Educational Impact and Registrant Perspectives for an Online Fundamental Oncology Pharmacy Conference in Canada
40. A Cross-Sectional National Study of the Adherence of Cancer Centres to 5-HT3 Receptor Antagonist Dosing Guidelines in Highly Emetogenic Chemotherapy Regimens
41. Canadian Real-World Experience with Everolimus in Combination with Exemestane in Post-Menopausal HR+ HER2- Advanced Breast Cancer Women – 1<sup>st</sup> Subgroup Baseline Analysis from the Treat ER+IGHT Canadian Prospective Observational Study (NCT02753686)
42. Adherence to Acute Chemotherapy Induced Nausea and Vomiting Prophylaxis Guidelines at Canadian Pediatric Hospitals
43. Clinical Incidence of Febrile Neutropenia in Early Stage Breast Cancer Patients (ESBC) Receiving Adjuvant FEC-D Treatment at an Outpatient Ambulatory Care Centre
44. Validation of a Novel Trastuzumab-Induced Cardiotoxicity Prediction Tool for Breast Cancer Patients



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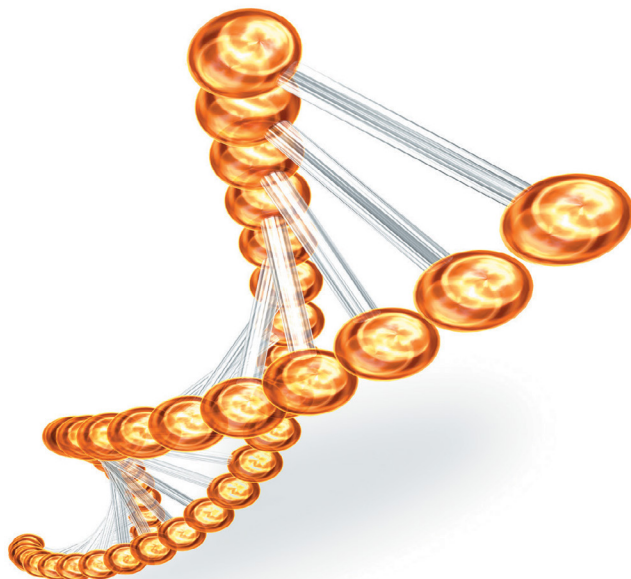
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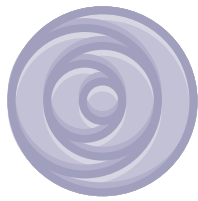
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**Reference:** OPDIVO Product Monograph. Bristol-Myers Squibb Canada, August 26, 2016.



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## Poster Abstracts

### Administration

#### Development of an E-Learning Module for Chemotherapy Checking Certification

**Objective:** Develop a certification process to obtain the designation of Authorized Chemotherapy Checker. The certification developed incorporates a variety of learning methods including pre reading, training and mock simulations presented in an E learning module.

**Study Design:** In conjunction with a graphic design team and with input from Human Factors specialists, an E-learning module was created. The module first demonstrated and then required learner participation for each of the key components involved in chemotherapy checking: assembly check, prep check, dose check, final check IV and final check oral. Beta testing of the module was conducted with novice users prior to final approval.

**Results:** A process was developed for the certification of Authorized Chemotherapy Checkers. The key piece of this process was the creation of an interactive E-learning chemotherapy checking module. A final test requiring 100% ensures the learner has a thorough understanding of the checking process.

**Conclusion/Recommendation:** The necessary skills to safely complete chemotherapy checking can be enhanced by the use of this E-learning module.

**CONTACT AUTHOR:** Annette Kempston, *Tom Baker Cancer Centre, Calgary, AB*

**CO-AUTHORS:** Carole Chambers, *Tom Baker Cancer Centre, Calgary, AB*

Roxanne Dobish, *Tom Baker Cancer Centre, Calgary, AB*

Robin Burns, *Cross Cancer Institute, Edmonton, AB*

David Garay, *Tom Baker Cancer Centre, Calgary, AB*

Suhkraj Gill, *Cross Cancer Institute, Edmonton, AB*



## Trends in the Use and Cost of Systemic Therapy Medications at The Saskatchewan Cancer Agency In 2006-2013

### Objectives:

1. To describe trends in systemic therapy use by cost, therapy type and cancer site from 2006-2013
2. Identify key drivers of overall growth of cancer drug spending
3. Identify cancer sites with the highest cost growth

**Design:** Data was obtained from the SCA Pharmacy system for all prescriptions dispensed between 2006 and 2013, which were linked with data from the Cancer Registry. Growth rates in annual expenditure, prescription volume, and number of unique systemic therapy users were calculated for the 20 most common cancer sites.

**Results:** Total expenses increased from \$24.3 million in 2006 to \$54.2 million in 2013. Anti-cancer drug spending grew by 123% during this time. Oral anti-cancer spending grew by 251%, and IV anti-cancer spending grew by 89%. Ageing and population growth only accounts for 3% of the APC in expenditures. The cancer site with the highest growth was multiple myeloma with a 139% change in drug spending.

**Conclusions:** Growth in expenditure is faster than growth in number of users and prescription volume. Demographic changes only accounts for 3% of change in expenditure. Oral anti-cancer treatments showed a faster cost growth compared to IV medications. Highest cost growth was observed amongst less common cancer sites.

**CONTACT AUTHOR:** Darryl Boehm, Saskatchewan Cancer Agency, Regina, SK

**CO-AUTHORS:** David Tran, Saskatchewan Cancer Agency, Saskatoon, SK

Riaz Alvi, Saskatchewan Cancer Agency, Saskatoon, SK





## Baxter Elastomeric Pumps: Weighing as an Alternative to Visual Inspection

**Objective:** Elastomeric pumps are used to administer 46-hour infusions of 5-fluorouracil (5FU). Standard practice involves patients visually monitoring their pumps to ensure proper infusion. This subjective process can be confusing and lead to concerns about under- or over-dosing. Baxter has not acknowledged weighing pumps as a validated alternative for monitoring. This study aims to validate weighing as an objective monitoring method, as well as determine patient preference for weighing versus visual inspection.

**Design:** Patients on a 46-hour 5FU infusion returned to the clinic approximately 24 hours after starting treatment. Their pump was weighed on a StarFrit kitchen scale. Date, time, and weight were recorded. Patients were asked if they preferred weighing or visually inspecting their pump.

**Results:** Pumps (n=103) were weighed 17.25-27.5 hours (average 22.3) after connection. The average weight of a pump was 189g. Linear regression resulted in an overall average flow rate of 4.561mL/h. This was 8.78% slower than the manufacturer defined flow rate of 5mL/h  $\pm$  10%, but within the expected variability. For patients who had a preference of method, more than twice as many preferred weighing.

**Conclusion:** With proper patient education, weighing Baxter Infusors can be an objective alternative to the current standard of visual inspection.

**CONTACT AUTHOR:** Ellen Cusano, *University of Ottawa Faculty of Medicine, Ottawa, ON*

**CO-AUTHORS:** Raafi Ali, *Cross Cancer Institute and University of Alberta, Edmonton, AB*

Michael Sawyer, *Cross Cancer Institute and University of Alberta, Edmonton, AB*

Carole Chambers, *Cancer Services, Alberta Health Services, Calgary, AB*

Patricia Tang, *Tom Baker Cancer Centre and University of Calgary, Calgary, AB*



## Robotic Automation at Hamilton Health Sciences: i.v.STATION ONCO by OMNICELL

**Objective:** to analyze present-day accuracy and efficiency of the i.v.STATION ONCO Hazardous Compounding Robot at the Juravinski Cancer Centre (JCC) in Hamilton, Ontario.

**Design:** Data was collected from the i.v.STATION database software, as well as from OMNICELL engineers. With this data snapshot (over 8 weeks), analysis was performed on the percentage of completed preparations vs. failed preparations to determine the overall accuracy of the IV ONCO. The i.v.Station software was also used to collect batching and patient specific compounding data.

**Results:** Currently to date, the i.v.STATION ONCO produces an average of 30% of all patient specific medications at the JCC with an overall accuracy pass rate of 96.5%. In regards to batching, the I.V STATION ONCO produces on average 180 & 75 doses per month of Doxorubicin 40mg and 5-Fluorouracil 2500mg syringes respectively.

**Conclusion:** Presently at the JCC, roughly 3 out of every 10 patients have i.v.STATION ONCO preparations. The i.v.STATION ONCO produces nearly all doses of Doxorubicin 40mg, and 5-Fluorouracil 2500mg via batching. Following the next OMNICELL upgrade, the JCC is hopeful to produce at least 60% of all patient specific doses prepared in the IV ONCO.

**CONTACT AUTHOR:** Amanda Dam, *Hamilton Health Sciences, Hamilton, ON*

**CO-AUTHOR:** Monika Graham, *Hamilton Health Sciences, Hamilton, ON*



## LMWH First Dose Program to Treat Cancer-Associated Thrombosis in a Pharmacy Setting

Currently, clinically stable patients diagnosed with a pulmonary embolism or deep vein thrombosis are commonly referred to the emergency department (ED) for management. This practice strains an already overburdened ED and is associated with long waiting time and poor disease/injection education for patients. This pilot study sought to determine if clinically stable cancer patients with a newly diagnosed blood clot could be effectively managed with a venothromboembolism first-dose program by a community pharmacist following a guidelines-based algorithm to prescribe and initiate LMWH therapy. We hypothesized that this novel care pathway could provide faster patient care, more comprehensive disease education, self-injection training, and follow-up. Forty-eight were enrolled in this pilot study. We observed that this alternative treatment pathway provided safe and effective VTE treatment combined with excellent patient satisfaction. Following the pharmacist's teaching, most patients felt confident about their ability to self-inject and about their VTE management. No occurrences of bleeding or other side-effects were observed in the patients enrolled in the pilot study. This study demonstrates that pharmacists are capable of delivering complex care services in the outpatient environment, particularly in the management of VTE, affording the patient better care with a lower cost to the healthcare system.

**CONTACT AUTHOR:** Jacob Easaw, *Cross Cancer Institute, Edmonton, AB*

**CO-AUTHORS:** Susan McCall, *LEO Pharma Inc, Thornhill, ON*

Adrian Azim, *Shoppers Drug Mart North Hill Centre, Calgary, AB*





## Remote Chemotherapy Drug Delivery Service Model

**Objective:** To provide a chemotherapy mixing service out of a Tertiary Cancer Centre pharmacy for delivery in a rural Community Cancer Centre and maintain key principles:

- Continue to be patient centered
- Maintain safety and quality
- Continue to provide cancer services as close to home as possible
- Optimize processes to deliver the maximum volume of chemo protocols
- Engage key stakeholders in the planning process

**Design:** Planning meetings were held over a 6-month period to establish the work plan. Processes for implementation were established including addressing issues such as expiry of drugs and appropriate temperature controls for shipping of prepared chemotherapy. A Frequently Asked Questions (FAQ) document was created to address specific issues identified in the planning process. Changes to clinic schedules were communicated to patients and impacted clinicians in advance. An evaluation survey was circulated to collect feedback on the new program and allow for identification of some areas for improvement.

**Results:** Data collected on the number of chemotherapy preparations remotely prepared and delivered indicated same or higher number of patients treated at the rural site.

**Conclusion:** The new model maintained the key principles and was successfully achieved by the target date.

**CONTACT AUTHOR:** Sukhraj Gill, *Alberta Health Services, Edmonton, AB*

**CO-AUTHORS:** Roxanne Dobish, *Alberta Health Services, Edmonton, AB*

Carole Chambers, *Alberta Health Services, Edmonton, AB*

J. Robin Burns, *Alberta Health Services, Edmonton, AB*

Janice Chobanuk, *Alberta Health Services, Edmonton, AB*



## Learner Feedback Directs Changes to Oncology Pharmacy Education

**Objective:** To determine how learner feedback shapes the BC Cancer Agency (BCCA) Oncology Pharmacy Education Program. This program, henceforth called the Pharmacy Education Program, is an online, self-directed curriculum developed by BCCA.

**Design:** Pharmacy Education Program modules are published with learner feedback surveys, which must be filled out to obtain a certificate of completion. Program organizers review learner feedback and determine if program improvements can be made to address suggestions.

**Materials and Method:** Learner feedback is reviewed every 6 months by program organizers. A decision making framework was developed to determine whether suggestions warrant program changes. Feedback that warranted changes was collated for the first three years of the program's on-line publication. Changes were categorized as immediate changes made or future changes to consider.

**Results:** Implementing suggestions from learner feedback resulted in several changes to the Pharmacy Education Program, such as making online resources more accessible, clarifying content, and expanding the target audience to include pharmacy technicians and assistants.

**Conclusion:** Learner feedback leads to many improvements to the Pharmacy Education Program, and will continue to guide the development of education modules.

**CONTACT AUTHOR:** Rhonda Kalyn, *BC Cancer Agency, Kelowna, BC*

**CO-AUTHORS:** Mandeep Bains, *BC Cancer Agency, Kelowna, BC*

Lynne Ferrier, *BC Cancer Agency, Kelowna, BC*

Sanna Pellat, *BC Cancer Agency, Kelowna, BC*



## Unraveling IV CQI Pump Data: Is there a Smart Way of Reducing Medication Errors?

**Objective:** Intravenous infusion pumps with Dose Error Reduction Software (DERS) can reduce risks associated with intravenous administration. DERS pump technology incorporates safeguards to improve patient safety and decrease medication errors. A Continuous Quality Improvement (CQI) review utilizing pump data was conducted at the BC Cancer Agency. Objectives include evaluating frequency of alerts, analyzing incidence, root causes and provide recommendations to improve safety, prevent alert fatigue and standardize practice.

**Design:** Data was collected from Alaris® Guardrails CQI Reporter, pharmacy and electronic patient chart databases. Paclitaxel, oxaliplatin and fluorouracil were selected for review as the top drugs causing alerts. Infusion concentration, duration, dose and excess volume were the parameters analyzed. The results were reviewed by an interdisciplinary committee.

**Results:** There was high incidence of paclitaxel, oxaliplatin and fluorouracil alerts (>70%). Underlying causes for the alerts included underestimation of overfill volume calculation, mismatch of concentration calculation and non-standardized fluorouracil administration protocols. As a result of the review, plans are in place to streamline and update practices and protocols.

**Conclusion:** CQI analysis of pump data provides a measurable tool for evaluating use patterns. Using an interdisciplinary review approach, data are reviewed in a meaningful way to shape practice and reduce risk for medication errors.

**CONTACT AUTHOR:** Victoria Kletas, *BC Cancer Agency, Vancouver, BC*

**CO-AUTHORS:** Tonya Ng, *BC Cancer Agency, Vancouver, BC*

Isabell Kang, *BC Cancer Agency, Vancouver, BC*





## Time to Clean Up! An Organization's Response to Regulatory Compounding Standards

**Objective:** The purpose of the pilot was to develop policies and procedures and training materials to educate housekeeping staff on cleaning of cleanroom facilities and documentation and training tools to comply with the new provincial legislative changes and NAPRA sterile compounding standards.

**Design:** Pharmacy, Housekeeping, Infection Control, and Health Safety Wellness developed policies and procedures outlining key principles for cleaning and disinfecting cleanroom facilities. Documentation and training tools were developed including a presentation highlighting principles for cleanroom facilities, poster, written test, competency assessment and a documentation log. The new procedures were piloted at the Juravinski Cancer Center in August 2016.

**Results:** Housekeeping personnel (N=2) participated in the pilot utilizing the new pharmacy cleaning procedures and tools. All trained staff passed the written test and observational competency assessment evaluating their proficiency in adapting to the new procedures. At 5 months post training, cleaning documentation logs were correctly completed on a daily basis and regular biweekly observational checks were conducted as a measure of compliance to the processes.

**Conclusion:** The pilot meets the new standards and will standardize the cleaning process and training of housekeeping staff across all cleanroom facilities across our organization.

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## The Particle Chase... A New Challenge in the Cleanroom

**Objective:** The purpose of the pilot was to develop policies and procedures and training materials to educate housekeeping staff on cleaning of cleanroom facilities and documentation and training tools to comply with the new provincial legislative changes and NAPRA sterile compounding standards.

**Design:** Pharmacy in collaboration with Health Safety Wellness developed policies and procedures outlining key principles for environmental testing of particle counts within the Juravinski Cancer Center's cleanroom facilities. Sampling and action plans were developed and testing began at the Juravinski Cancer Center in August 2014 at an interval of every 6 months.

**Results:** A review of two years of measuring viable and non-viable particle counts at our site's cleanroom facilities have highlighted areas of deficiencies within the cleanroom facilities such as facility design flaws and provided areas of focus for cleaning practice for both pharmacy and housekeeping staff.

**Conclusion:** The implementation of an environmental monitoring program has proven to be a valuable outcome measure for adherence to sterile compounding standards and highlighted the importance of standard operating procedures and proper facility design.

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## Shifting Trends: An Analysis of IV and Take-Home Cancer Drug Use and Public Spending in Ontario

**Objective:** The use of take-home cancer drugs (THCD), like oral chemotherapy, has significantly increased while the costs of new cancer drugs continue to rise. We reviewed costs and utilization of THCD and IV cancer drugs (IVCD) funded by Ontario Public Drug Programs between 2010/11 -2015/16.

**Approach:** Ontario Drug Benefit claims data, sourced from ICES, were reviewed to identify 74 THCD. Claims data were obtained for all 39 IVCD funded by the New Drug Funding Program. Annual government costs and number of utilizing recipients were collected to estimate average annual growth rates (AAGRs).

**Results:** Government spending on THCD rose from \$199 to \$371 million over a six-year span at an AAGR of 13.4%. Spending on IVCD increased from \$219 to \$344 million at an AAGR of 9.7%. Over the six years, the growth in spending more than doubled the growth in utilizing recipients (AAGR of 2.8% for IVCD and 4.6% for THCD).

**Conclusion:** While both utilization and costs of IVCD and THCD continue to grow, use, spending and growth for THCD have outpaced IVCD, which outpaces growth in many other areas of the health system. Reimbursement policies should be considered in the context of the need for long-term funding sustainability.

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## Ontario Dispensing Patterns for Publicly Funded Take-Home Cancer Drugs

**Background:** Take-home cancer drugs (THCD) (e.g., oral chemotherapy) present new safety and quality challenges to patients and providers. THCD dispensing models vary across Canada. In Ontario, THCD may be dispensed from retail pharmacies located in the community, hospital or cancer centre.

**Objective:** To describe the current dispensing patterns for THCD reimbursed by the Ontario Drug Benefit (ODB) Program.

**Approach:** ODB claims (obtained from the Institute of Clinical Evaluative Sciences) were reviewed for the 13/14 fiscal year and categorized by drug and pharmacy type. Variables examined included claims volume by pharmacy and drug type, and government costs

**Results:** In the 13/14 fiscal year, 4055 pharmacies (community = 4008, hospital = 41, cancer centre = 6) processed 501,905 claims for 233 DINs classified as THCD. Community pharmacies processed the majority of claims (87.5%). The weekly dispensing rate was the highest at cancer centres with an average of 132 prescriptions/week/pharmacy compared to 2 prescriptions/week/community pharmacy. Overall, hormonal therapy was the most frequently dispensed, representing 64.3% of THCD claims.

**Conclusion:** Overall weekly THCD dispensing frequency appears to be the highest in cancer pharmacies followed by hospital and community pharmacies. This trend may suggest that convenience and access to specialized staff or integrated care drive the patient's choice.

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## Complying with New Provincial Regulatory Authority Requirements for Documentation and Traceability: A Technical Perspective

**Objective:** Complying with provincial regulatory authorities for traceability and documentation of intravenous sterile products using a camera system (Phocus RX®) requires workflow changes to enable a pharmacy technician to perform the final check of sterile IV hazardous products.

**Design:** Pre-implementation the compounding room was staffed with three technicians: two compounders, one “checker”. The checker performed visual checks of drug, volume, IV base solution and expiry dates before injection into the final dispensing container. The final product was labeled by the checker and sent out with used vials to a pharmacist who performed final verification before dispensing.

This involved a major workflow change for documenting and storing information, including a revamp of product preparation sheets and downtime procedures

**Results:** Phocus Rx® allows for compliance with regulatory requirements of documentation and traceability of prepared products. It provides an independent double check of products since the final check is performed by a technician. Eliminating the burden of checking product and manually documenting by the staff in the clean room, provides controlled work flow leading to increased patient and worker safety.

**Conclusion:** Phocus Rx® eliminates the duplicity of checking before dispensing, allows for collection, storage and retrieval of information that was previously done manually.

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## Improving the Safe Administration of Chemotherapy to Pediatric Patients through Standardized Pre-Printed Orders

**Background:** Chemotherapy is the primary treatment for childhood cancers but has the potential to cause great harm. Complex study protocols consist of discrete phases that are difficult to navigate, challenging the development of standardized pre-printed orders.

At the Saskatchewan Cancer Agency (SCA), hand-written pediatric chemotherapy orders require numerous clarifications between staff, resulting in workflow interruptions and 'near-misses.' The need for safer administration of chemotherapy was identified.

**Objective:** We sought to improve the safety of chemotherapy administration through standardized pediatric pre-printed orders.

**Design:** At the SCA (November 28, 2015 to June 30, 2016) pediatric pre-printed orders were developed through an interdisciplinary group. The primary outcome was the percentage of pre-printed orders used for pediatric chemotherapy administration.

**Results:** A total of 143 pre-printed orders (61 new and 82 revised) were developed over a seven-month period. At baseline, 24% of total orders used standardized pre-prints, increasing to 85% (n=11/13) at follow up.

The number of pharmacist-initiated clarifications decreased. A convenience sample revealed a target of less than 50% of orders needing clarification was maintained to the 120-day follow up (n=6/13, 46%)

**Conclusions:** Standardized pediatric chemotherapy pre-printed orders were successfully implemented. Pharmacist-initiated order clarifications decreased displaying safer administration of chemotherapy.

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## Daily Chemotherapy Workload at a Regional Cancer Centre: Review of 2016

**Objective:** The aim of our study was to review our cancer centre's daily workload in 2016 to determine 'hotspots' in scheduling and discuss any future resource changes to improve workplace efficiency.

**Design:** Chemotherapy appointment data was extracted from our centre's electronic scheduling program (CHARM) and time stamp data was divided into groups (Mon-Fri). We further divided the data from each day into nursing workload and pharmacy workload.

**Results:** In 2016 over 18,000 regular treatments were administered at our cancer centre. These required nursing assessment the day of treatment, before approval. Smallest workload was identified on Mondays (63 regular treatments on average) with nursing assessment and approval averaging 1 hour and 11 minutes, and chemotherapy preparation averaging 55 minutes. Largest workload was on Thursdays (83 regular treatments on average) with nursing assessment and approval averaging 55 minutes, and chemotherapy preparation averaging 51 minutes.

**Conclusion:** Although on average there was a heavier workload on Thursdays, overall workplace efficiency was greater. Further investigation is required to understand why workplace efficiency is inversely proportional to the number of treatments administered as the week progresses. Some suggestions include the types of chemotherapy administered daily, scheduling based on clinic days, and day 1 bloodwork review.

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## Establishment of a Haematological Multidisciplinary Oral Chemotherapy Clinic at a Community Hospital Leads to Decreased Emergency Department Visits

**Background:** Multidisciplinary oral chemotherapy clinics (MOCC) have been proven to improve care in patients with solid tumours but there is little data in the haematological setting. A malignant haematology MOCC was formed to determine if it would decrease emergency department (ED) visits.

**Methods:** Retrospective patient chart reviews were done for baseline data. A MOCC with a nurse, pharmacist and haematologist was established. Standardized teaching and assessment protocols for each drug were developed and incorporated into the electronic health record. Outcomes measured included improvements in medication reconciliation; documentation of adverse events, dose modification, and patient compliance; unscheduled MD assessments and ED visits. Qualitative interviews were performed to assess patient satisfaction.

**Results:** 30 patients with Haematological malignancies were enrolled during the 10-month study. After a median of 8 months of follow up, there was 100% medication reconciliation and 92% medication compliance. 47% of patients had interventions requiring dose modifications. There was a 20% increase in unscheduled physician visits resulting in decreased ED visits by 33%. Patients were highly satisfied with the MOCC.

**Conclusion:** In a community setting, the implementation of MOCC resulted in early recognition of AE, reduced ED visits, and high patient satisfaction and medication compliance in a Malignant Haematological setting.

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## Transitioning Physician IV Treatment Billing from Paper to Electronic Via Pharmacy Maintained Computerized Physician Order Entry (CPOE) System

**Objective:** Evaluate the expected increase in revenue for physician IV treatment billing by moving from a paper based process to an electronic process incorporated into the CPOE system managed and maintained by pharmacy.

**Design:** After implementation of the billing module into our computerized physician order entry (CPOE) system, we continued to use paper tracking during a 'phase-out' period in March 2015. Revenue generated from the paper copies were compared to the electronic entries from March 6, 2015 to March 27, 2015. Billing codes were assigned a cost-value depending on the chemotherapy administered.

**Results:** During the 3 week observational period the paper method captured 866 patient treatments amounting to \$109,051 in revenue from physician billing. The electronic copy data is pending extraction, which will be available for poster presentation.

**Conclusion:** As all IV anti-cancer treatments are required to be entered into our CPOE system, incorporating the billing process ensures complete capture of IV treatments for physician billing. Workload has increased slightly when the pharmacist builds regimens into our CPOE system and in physician training by the pharmacist, but the impact has been a more efficient process (less workload burden on nursing) and financial gain for the cancer centre.

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## Adaptation of a Hybrid Computer Prescriber Order Entry (CPOE) System in an Oncology Centre of a Multi-Site Tertiary Care Teaching Hospital

**Objective:** In 2001, University Health Network (UHN) consisted of three hospitals: Toronto General Hospital (TGH), Toronto Western Hospital (TWH), and Princess Margaret Hospital (PMH). PMH provides the majority of cancer care within UHN. CPOE was implemented at TGH and TWH but not at PMH due to system constraints regarding oncology. Fifteen years later, UHN has expanded and strives to become a High Reliability Organization (HRO), and CPOE implementation at PMH is revisited.

**Design:** Adaptation of the current CPOE system to an oncology setting is described. Medication related project scoping and analyses due to system limitations are discussed and build activities highlighted. Impact on downstream applications and collaboration with other sites are also addressed.

**Results:** A hybrid system with criteria for medications on paper vs. CPOE responding to unique oncology needs and system limitations is developed and implemented. Challenges included standardization of practice differences, updating policies and procedures, and addressing existing system issues. Opportunities included a unified patient information system and standardized policies and procedures allowing for seamless patient information transfer processes.

**Conclusion:** Building on existing CPOE infrastructure to meet oncology needs is complex. We hope our experience will be valuable to any cancer centre considering CPOE development and implementation.

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## Pharmacy Practice

### Experiences from the Cardio-Oncology Clinic at South Health Campus in Calgary, Alberta

Cardio-Oncology is an emerging subspecialty that aims to support patients undergoing cancer treatment at higher risk of cardiotoxicity through detection, prevention and treatment. The Cardio-Oncology clinic at South Health Campus has provided care for over 900 patients since its formation in 2013. A multidisciplinary team of cardiologists, nurse clinicians and a pharmacist collaborate with patients and families to identify and manage cardiac risk factors; assess the cardiac risk of cancer treatment; monitor for cardiotoxicity during and after cancer treatment; and initiate prompt treatment with cardioprotective medications, when indicated.

We reviewed the types of patients referred to clinic from November 2013 until September 30 2016. Of the 897 patients referred, 385 patients were actively followed. Referrals were received most often for patients with breast cancer (33%) and non-Hodgkin's lymphoma (24%) for cardiology clearance (25%), other reasons (19%) or baseline imaging (17%). Pharmacist interventions include: assisting in the selection and initiation of cardioprotective medications; assessing for drug interactions and minimizing adverse effects; titrating medications; monitoring therapy for efficacy and safety; and providing medication education.

Future directions include expansion of clinical services based on the evolving needs of our unique patient population, development of clinical care pathways, and participation in national research initiatives.

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## Implementation of Additional Prescribing Authorization Among Oncology Pharmacists in Alberta

**Objective:** To describe the practice settings and prescribing practices of oncology pharmacists with additional prescribing authorization (APA).

**Design:** A descriptive, cross sectional survey of all oncology pharmacists in Alberta was conducted using a web-based questionnaire over 4 weeks between March – April 2016. Pharmacists were identified from the Cancer Services Pharmacy Directory and leadership staff in Alberta Health Services. Descriptive statistics were used to describe the practice setting, prescribing practices, motivators to apply for APA, and the facilitators and barriers of prescribing.

**Results:** The overall response rate was 41% (71 of 175 pharmacists). Those with APA made up 38% of respondents. They primarily worked in urban, tertiary cancer centres, and practiced in ambulatory care. The top three clinical activities participated in were medication reconciliation, medication counselling/education, and ambulatory patient assessment. APA was most useful for ambulatory patient assessment and follow up. Antiemetics were prescribed the most often. The median number of prescriptions written in an average week of clinical work was 5. Competence and self-confidence were the strongest facilitators of prescribing. The strongest motivator to apply for APA was relevancy to practice.

**Conclusion:** The majority of oncology pharmacist prescribing occurs in ambulatory care with a large focus on antiemetic prescribing.

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## **A Multidisciplinary Team Approach to Ensuring Safe Administration of a Desensitization Protocol Involving a Cytotoxic Medication**

**Objective:** To identify practical considerations for safe administration of an oxaliplatin desensitization protocol in a tertiary hospital ICU.

**Design:** A 16-step, 11-hour oxaliplatin desensitization protocol with graduated infusion rate was provided by another institution to be adapted for a 45-year-old man with stage IV colorectal cancer receiving pseudoadjuvant FOLFOX. A multidisciplinary team consisting of an oncologist, allergists, nurses and pharmacists was established to identify institution-specific challenges and propose possible strategies.

**Results:** The team identified three major challenges: the need to minimize exposure to staff and the environment, the high potential for error from frequent changes of infusion rate and IV bags, and the need to maintain incremental oxaliplatin doses despite the use of non-oxaliplatin containing solutions to prime IV lines. In response, the team created preprinted templates for physician order, sterile compounding worksheets and step-by-step nursing medication administration record. In addition, oxaliplatin-containing IV bags with normal-saline-primed line were infused into empty IV bags to remove normal saline prior to administration to the patient. The patient received the desensitization protocol without incident.

**Conclusion:** A multidisciplinary team may be instrumental in identifying practical considerations and developing strategies for safe implementation of a desensitization protocol involving cytotoxic drugs.

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## Development and Implementation of an Oral Chemotherapy Pharmacy Program

**Objective:** The purpose of this poster is demonstrate to other oncology colleagues why we developed our Oral Chemotherapy Pharmacist role, how we developed and implemented the role, what the role encompasses, and where we see the role evolving in the future.

**Background:** This new pharmacist role was developed to manage the increased oral chemotherapy agents that are coming down the pipeline. Our goal is to improve clinical outcomes for our patients in a cost-effective manner by helping patients understand their treatment, manage their toxicities/drug interactions, encourage compliance, and review adherence as part of their inter-professional healthcare team.

### Design:

- Role Algorithm
- New oral chemotherapy patient handouts:
  - Cyclical
  - Continuous
  - Combined
  - Cytotoxic Precautions
- New standard work was developed and presented

### Results (Pie Graphs):

- Pharmacist Interventions
- Home Appointment (start date of medication) Distribution Amongst Cycle Type
- Home Appointment Bookings Breakdown

### Conclusion/Future Endeavors:

- Working in closer proximity to MO/Nurses
- In-person reviews when patient is at cancer clinic
- Completing all oral chemotherapy new workups and counselling
- Evaluating/improving via patient surveys
- Optimizing technician use:
  - Entering orders
  - Confirming start dates, lab requisitions
  - Fixing ARIA® (electronic chart) mistakes
  - Monitoring compliance

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## Effects of Reducing the Urine Alkalinisation Threshold Associated with High-Dose Methotrexate Administration

**Background:** At The Ottawa Hospital, patients are electively admitted for high-dose methotrexate (HDMTX) and receive sodium bicarbonate to alkalinise the urine. Historically, the dose of sodium bicarbonate was titrated to a urine pH  $\geq 8$  prior to HDMTX. In April 2015 the urine pH threshold was changed to  $\geq 7$ .

**Objective:** The study objective is to determine if a reduction in urine pH threshold from 8 to 7 results in a change in: (1) HDMTX-related hospital length of stay, (2) HDMTX clearance, and (3) rates of nephrotoxicity. Patient characteristics associated with prolonged HDMTX clearance were identified.

**Design:** Data were collected retrospectively from electronic records of elective patient admissions for HDMTX from September 2014 to December 2015.

**Results:** Lowering the urine pH threshold did not affect the hospital length of stay (absolute difference (h) 3.69; 95% CI -2.83-10.71) or clearance of HDMTX (Ke 0.060 vs. 0.066, respectively;  $p=0.175$ ). Nephrotoxicity rates were similar between groups (15.5% in the  $\geq 7$  group and 10.1% in the  $\geq 8$  group;  $p=0.34$ ). The dose of MTX and interacting medications were significantly associated with delayed methotrexate elimination.

**Conclusion:** There was no significant difference in HDMTX-associated hospital length of stay, HDMTX clearance, or rates of nephrotoxicity between urine pH thresholds.

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## Improving the Management of Breast Cancer in a Community Teaching Hospital: A Gap Analysis of Supports and Resources

**Objective:** To determine current perceived gaps in resources and support for breast cancer patients in North York General Hospital's Cancer Care Program.

**Design:** A gap analysis was conducted of the Cancer Care program at North York General Hospital in Toronto, Canada. Gaps were identified through staff interviews, telephone patient surveys and a patient focus group. Using a working group method, a document was developed highlighting gaps within each area of the program and potential solutions for an action plan.

**Results:** Two of the major themes highlighted by patients were the need for more choice of supports and resources available in multiple formats, and the need for a central person to help navigate them through the health care system from diagnosis to survivorship or palliative care. One of the major themes identified through staff interviews was the need for standardized information to provide to patients. The action plan was presented to the Breast Integrated Care Collaborative Committee and most items have since been implemented.

**Conclusion:** This project highlighted the importance of performing a gap analysis of various departments affiliated with a program. This approach led to a more consistent support/resource system available to breast cancer patients at North York General Hospital.

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## Incidence of Late Onset Neutropenia Associated with Rituximab use in B Cell Lymphoma Patients Undergoing Autologous Stem Cell Transplant

**Background:** Reversible late onset neutropenia (LON) associated with rituximab has been reported with incidence rates varying from 15–70% in B Cell Lymphoma (BCL) patients receiving autologous stem cell transplantation (ASCT).

**Design:** We conducted a retrospective descriptive study at one tertiary care center in adult BCL patients treated with rituximab and ASCT between January 1, 2004 and June 30, 2014. LON was defined as an absolute neutrophil count (ANC)  $< 1.0 \times 10^9$  cells/L after neutrophil engraftment and  $< 6$  months post ASCT.

**Objective:** The primary objective was to determine the incidence of LON. The secondary objectives were to examine whether the use of rituximab with re-induction therapy, mobilization or high dose chemotherapy (HDC) regimens increased the risk for LON, and to evaluate infectious complications.

**Results:** Of 315 subjects, 92 (29.2%) developed LON. Mobilization regimens containing rituximab (OR 2.90 95% CI: 1.31–6.40), HDC containing rituximab (OR 1.87 95% CI: 1.14–3.05), and exposure to rituximab in either or both regimens (OR 3.05 95% CI: 1.36–6.88) significantly increased the risk of LON. While neutropenic, 17.4% experienced an infection, 7.6% experienced febrile neutropenia, and 5.4% were hospitalized. **CONCLUSION:** Rituximab with mobilization or HDC may increase the risk of LON post-ASCT.

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## Pediatric Chemotherapy Administered at Home: The Hospital at Home Program

**Objective:** The Hematology, Oncology, Blood and Marrow Transplant (HOT) program, at the Alberta Children's Hospital, developed the Hospital at Home (H@H) program to pilot the feasibility of administering chemotherapy in pediatric patients' homes. As part of ongoing evaluation of the program we present data describing and quantifying the chemotherapy and supportive care medications dispensed as part of the H@H program.

**Design:** For a 38 month period, data was recorded pertaining to patient enrollment to the H@H program. Pharmacy records were accessed to determine the frequency and types of chemotherapy and supportive medications dispensed for administration in the home.

**Results:** Over the data collection period, there were a total of 188 patients enrolled with H@H and a total of 2,425 home visits. Pharmacy provided 482 preparations to be administered in the home; 84% (409) were chemotherapy products (oral and IV) and 90% (434) were parenteral products (chemotherapy and supportive care).

**Conclusion:** The H@H program has increased patient and family satisfaction by allowing for the delivery of chemotherapy and supportive care outside of the institution. By utilizing the home setting for administration of chemotherapy, teaching and supportive care, increased capacity was created the HOT program acute care unit and ambulatory clinic.

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## **A Retrospective Study of Symptom Burden in Patients Who Received Treatment With a PD1 Inhibitor, Either Nivolumab or Pembrolizumab, at the Saskatoon Cancer Centre**

**Objective:** PD1 inhibitors are approved in multiple tumor types in Canada. Studies in various tumor groups have had OS or PFS as the primary endpoint, with QOL as one of the secondary endpoints. In the available data, the patients on the PD1 inhibitors demonstrated an improvement in QOL when compared to the standard of care arms across multiple trials in multiple tumor sites.

**Design:** Patients treated at SCC with commercial supply of either Pembrolizumab or Nivolumab from August – November 2016 were included. Patients completed a questionnaire, The ESAS (Edmonton Symptom Assessment System) during drug infusion at our clinic. The ESAS is a tool that was already in use for new patients at our clinic and is easily completed by patients.

**Results:** 38 patients were included in the study. During the observation period some patients were initiated on treatment; and some patients had already received multiple cycles (with cycle #31 being the highest). We found that patient symptom burden as indicated by the ESAS questionnaire did not increase as the number of cycles of treatment increased.

**Conclusion:** The use of PD1 inhibitors in clinical practice represents an opportunity for potential long term treatment of cancer patients.

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## An Oral Systemic Therapy Case Management Model

**Objective:** Establish a case management model to improve patient safety and coordination with community pharmacy for patients receiving oral systemic therapy in Nova Scotia.

**Design:** A 0.5 FTE oncology pharmacist focused for a 6 month pilot (January to June 2016) at the Cape Breton Cancer Centre to develop a proposed Oral Systemic Therapy Case Manager (OSTCM) position based on provincial standards. The OSTCM managed new oral systemic therapy prescriptions through formalized order verification and drug interaction checking. Coordination with social work to establish access and funding occurred before prescriptions reached community pharmacy to minimize treatment delays. The OSTCM forwarded prescriptions directly to the community pharmacy with a coordination phone call detailing diagnosis, scheduling, required counseling info and follow up education.

**Results:** The oral systemic therapy patients managed by the OSTCM represented 35% of total new chemotherapy starts at the center. Thirty-three (33) % of patients managed had an identified drug interaction that required intervention. Thirty pharmacies received coordination and surveys showed pharmacists felt a greater connection with the clinic.

**Conclusion:** The OSCTM role allowed for timely coordination of safety aspects around oral systemic therapy in the clinic and provided a formal liaison role between the clinic and community pharmacy.

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## Validation of Best Possible Medication History: Comparison Between Telephone and In-Person Interview

**Objective:** We explored if BPMHs by telephone interviews are comparable with result obtained from in-person interviews.

**Design:** At the Saskatchewan Cancer Centre (SCC) (February 23 and March 4, 2016), ten randomly selected patients underwent telephone BPMHs performed by pharmacy staff. For validation, in-person BPMHs were collected during scheduled clinic visits. The primary outcome was the percentage of discrepancies between the BPMHs obtained.

**Results:** A total of 22 discrepancies were identified between telephone and in-person BPMHs. Discrepancies were further categorized as drug (n=10, 45%), drug dosage (n=9, 41%), and allergies (n=3, 14%).

Additionally, discrepancies were categorized on potential to impact therapy: mild, moderate, and severe. Majority of discrepancies (n=18; 82%) were considered mild

**Conclusion:** This study displays in-person and telephone interviews result in comparable BPMHs. Majority of discrepancies were of mild clinical significance..

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## Review of a Pharmacist-Led Telephone Follow-Up Program for Patients Receiving Chemotherapy at a Tertiary Cancer Centre

**Background:** OCC Pharmacy's clinical call-back program provides teaching and advice for patients new to receiving chemotherapy. Trained pharmacists and pharmacy students initiate and facilitate calls to follow-up with patients at home one to three days after their first treatment to assess and manage treatment-related toxicities.

**Objective:** To characterize the scope of a pharmacist-led telephone follow-up program in patients receiving parenteral anticancer therapy at OCC through a retrospective chart review.

**Methods:** A retrospective review was conducted on the electronic pharmacy call-back database at the OCC to determine the number and proportion of patients successfully reached for one or more follow-ups. All patients new to chemotherapy between June 2013-June 2016 with one or more supportive medications were included.

**Results:** In three years, OCC Pharmacy called a total of 6984 patients, 5511 (78.9%) were successfully reached. 2184 unique patients were called and 314 patients were never reached. Some patients required more than one follow-up call: 1722 required two, 931 required three, and fewer required more.

**Conclusion:** It is difficult to comment on the efficacy and feasibility of the program with this data. Therefore, future studies should seek to investigate patient satisfaction, pharmacy interventions and their outcomes, as well as length of follow-up interactions.

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## Evaluating the Patient-Perceived Impact of Clinical Pharmacy Services and Proactive Follow-Up Care in an Ambulatory Chemotherapy Unit

**Objective/Purpose:** To evaluate the patient-perceived impact of delivery of clinical pharmacy services, including a proactive follow-up program, on patient understanding, satisfaction, and toxicity management.

**Study Design/Methods:** Patients who had received clinical pharmacy services at their initial chemotherapy treatment were identified and asked to complete a 20-point survey at the second or subsequent treatment. The services that the survey evaluated consist of face-to-face education during the first treatment and proactive telephone follow-up 3-7 days later.

**Results/Key Findings:** 107 of the 112 respondents (95.5%) indicated that the time with the pharmacist at the first treatment was worthwhile and 92.6% of respondents reported that the interaction with the pharmacist increased their understanding of the medication regimen. Of the 113 respondents, the majority was either “Very Satisfied” or “Satisfied” with the time the pharmacist spent with them (94.7%), and the pharmacist’s ability to answer their questions (92.9%). In addition, survey results indicate that the clinical pharmacy input provided in the pharmacist call-back program is valuable, with 92.6% of the 82 respondents indicating that this service is worthwhile, and 91.4% of 93 respondents stating that the pharmacist input helped them to manage side effects at home

**Conclusion/Recommendations:** Survey results indicate that patients value clinical pharmacy.

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## Research

### Impact of Genomic Analysis on Response to Therapy in Patients with Advanced Breast and Colorectal Cancers

**Objective:** The purpose of our study was to determine the relationship between the expression of certain genetic markers in patients with breast and colorectal cancers and clinical outcomes in terms of resistance or sensitivity to chemotherapy.

**Design:** We performed a comprehensive literature review, spoke to experts in the field, and conducted a retrospective exploratory analysis of patients with advanced breast and colorectal cancers for whom personalized oncogenomics data was available from July 2012 until November 2016.

**Results:** We identified a number of mRNA expression markers of interest in patients with advanced breast and colorectal cancers. These included DPYD, TYMP, and TYMS for patients receiving Capecitabine, PTEN for patients receiving Everolimus, ABCB1, GSTP1, TLE3, and TXNDC17 for patients receiving Paclitaxel, DICER1, EPHB4, PROM1, and FIGF for patients receiving Bevacizumab, TAP1 and TOP1 for patients receiving Irinotecan, and BRCA1, CDKN1A, EPHB4, ERCC1 and GSTP1 for patients receiving Oxaliplatin therapy.

**Conclusion:** The identification and evaluation of mRNA expression patterns of specific genetic markers in patients with advanced breast and colorectal cancers may impact response to therapy and overall survival. The results of this study contribute to the growing literature on personalized medicine and resistance and sensitivity markers for chemotherapy.

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## Revival of HBV, HCV and Incidence of Febrile Neutropenia Associated with R-CHOP in DLBCL Treated Patients

**Background:** Reactivation of HBV, HCV and febrile neutropenia are common in DLBCL patients undergoing R-CHOP chemotherapy. This ultimately leads to delaying the therapy, increasing hospital.

**Methods:** The recruited subject was DLBCL patients who underwent R-CHOP Chemotherapy, HBV and HCV related markers was performed after rituximab-containing treatment in 16 consecutive patients with CD20-positive B-cell lymphoma and were followed up for at least 3 months after treatment. No patients were screened for HBsAg and Anti-HCV before the start of chemotherapy nor did they receive GCSF within the 7 days after R-CHOP chemotherapy.

**Results:** Mean age of the patients with R-Chop was  $53.25 \pm 14.45$  years (range 32-83 years). Male preponderance in R-Chop was found to be higher 12 (75%) as compared to females 4 (25%). Among 16 patients, 15(93.75%) patients were HBsAg, Anti-HCV was negative and only 1(6.25%) has HBsAg positive, which was treated with antiviral therapy. As far as febrile neutropenia was concern, 1(6.25%) patient developed fever after 7 days post-cycle readmitted and treated with antibiotics.

**Conclusion:** The recent study highlighted the risk of revival of HBV, HCV and febrile neutropenia However, patients undergoing R-CHOP in DLBCL should be screened for viral markers and must be administer GCSF within 7 days post-chemotherapy.

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## Evaluation of Acute Biochemical Changes Associated with Doxorubicin, Bleomycin, Vinblastine and Dacarbazine in Hodgkin Lymphoma

**Background:** Changes in metabolic profile correlated with dose intensity ratio, could lead to arrhythmia, hyponatremia, metabolic acidosis and raise creatinine could lead physician to discontinue therapy, delaying treatment or alternating regimen.

**Aim:** To assess the consequences of ABVD on metabolic profiles in patients with Hodgkin lymphoma.

**Methodology:** This retrospective study was conducted at NIBD hospital. Baseline study of Urea, Creatinine, Electrolyte and LFTs were taken considered as control reading then again aforesaid parameters were taken after 15 days and considered as post-treatment reading. Means of above readings will be calculated and compared with common terminology criteria for adverse events v3.0 2006 (CTCAE) to find the differences in biochemical parameters at baseline (control group) and 15 days post-treatment to identify the types of toxicity as define by v3.0 2006 (CTCAE).

**Results:** Among patients treated with ABVD protocol in Hodgkin lymphoma therapy, significant difference of SGPT (p-value 0.007) was observed. Whereas the others were found mild, moderate and severe at baseline and after treatment with ABVD.

**Conclusion:** Despite the fact statistically insignificant change was constructing in most of the metabolic biochemical profiles in our study, but advancement was noted in many. More studies are desired on huge scale to certify these results.

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## Use of Entresto (Succubitril/Valsartan) in Anthracycline Induced Cardiomyopathy

Entresto significantly reduced cardiovascular mortality and hospitalizations due to heart failure with reduced ejection fraction (HFrEF), when compared to standard therapy. Entresto has not been directly evaluated in patients with HFrEF secondary to chemotherapy.

Patient A received doxorubicin for mantle cell lymphoma, Patient B received epirubicin for HER-2 negative breast cancer. Both patients were initiated on cardio-protective medications for symptomatic HFrEF, including angiotensin-converting enzyme inhibitors, beta blockers, mineralocorticoid receptor antagonists and diuretics. Patient A presented a year following anthracycline, Patient B fourteen years post. Both patients remained dyspneic despite optimal medical therapy and were switched from an ACEI to Entresto. Patient A experienced a decline in NTproBNP (68281 ng/L to 14130 ng/L) 2 weeks following initiation and reported an improvement in dyspnea. She was titrated to a target dose of 200 mg twice daily without complications. Patient B developed hypotension but tolerated 50 mg twice daily.

We report 2 cases of patients with reductions in LVEF secondary to chemotherapy that experienced an improvement in NTproBNP and HF symptoms and tolerated therapy with Entresto. The long-term efficacy and safety of Entresto in anthracycline-induced cardiotoxicity are unknown. Our experience demonstrates Entresto may be a potential option in this highly complex patient population.

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## Optimisation of a Technique for Recovery of Circulating Tumour Cells from the Peripheral Blood of Colorectal and Breast Cancer Patients

**Objective:** Optimising future approaches for treatment of patients with metastatic cancers requires an ability to sample cells disseminating from initial sites to form metastatic deposits. Existing methods to identify circulating tumour cells (CTCs) do not recover all tumour cells. We are examining different substrata that may be used to capture CTCs optimally from patient blood.

**Design:** A group of 20 patients with Stage IV colorectal or breast cancer provide blood samples at the time of clinic visit. The blood is fractionated on Ficoll-Paque PLUS® and CTCs are recovered from the interface together with white cells, washed and placed on substrata composed of selected extracellular matrix (ECM) proteins including collagen, fibronectin, laminin and complex ECM. After 18h of incubation at 37°C non-adherent cells are washed away and the remaining cells are stained with immunofluorescence for marker proteins.

**Results:** Data show differences in results depending upon the ECM proteins used as the capture substratum, with staining positive for epithelial markers EpCAM and pan-cytokeratin. Further efforts are directed toward identifying markers of disease progression such as chemokines.

**Conclusion:** Capture of CTCs using ECM-based substratum offers a different approach to tracking and characterising cancer cells in the peripheral blood to using EpCAM antibody-based protocols.

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## Development of Second Primary Malignancies in Multiple Myeloma Patients Treated with Lenalidomide: An Alberta Perspective

The rates of second primary malignancies (SPM) in multiple myeloma (MM) patients treated with lenalidomide ranges from 2.3-7.2%. The primary objective of this study was to identify the proportion of patients in Alberta who used lenalidomide to treat MM and developed a SPM.

A retrospective chart review was conducted from January 1, 2008 to June 30, 2015. Patients were eligible for inclusion if they received lenalidomide for MM during the study timeframe and were  $\geq 18$  years of age.

A total of 768 patients were included. There were 41 SPM that developed in 35 patients (5.3% occurrence). Exposure to alkylating agents, other immunomodulatory agents or radiation therapy did not differ between groups. Patients who developed a SPM received treatment for a longer duration (26.5 vs. 19 cycles,  $p=0.021$ ) and were less likely to have had a stem cell transplant (34.3% vs. 52.3%,  $p=0.038$ ). There was no difference found in overall survival between the two groups (96.9 vs. 95.0 months,  $p=0.872$ ).

In this study, rates of SPM identified in Alberta were similar to rates reported in the literature and overall patient survival was not found to differ between patients who developed a SPM and those who did not.

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## Real-World Evidence of Canadian 5-HT<sub>3</sub> Receptor Antagonist Usage for Chemotherapy-Induced Nausea and Vomiting (CINV) in 2016

**Objective:** Provincial cancer guidelines recommend using dexamethasone, one day of a 5-HT<sub>3</sub> receptor antagonist (RA), + an NK-1 RA for the prevention of nausea and vomiting in patients receiving moderately emetogenic or highly emetogenic chemotherapy. The objective of this study was to compare the real-world use of 5-HT<sub>3</sub> RAs to guidelines.

**Design:** 5,886 pharmacies across Ontario, Quebec, Alberta and BC were invited to participate in a cross-sectional survey of 5-HT<sub>3</sub> RA prescriptions. Participating pharmacists were asked to provide product, dose, frequency, quantity dispensed and reason for use.

**Results:** A total of 318 5-HT<sub>3</sub> RA prescriptions from 46 pharmacies were collected and analyzed. The most frequently prescribed 5-HT<sub>3</sub> RA was ondansetron (92%, 294/318) of which 45% (132/294) was for cancer-related emesis. The remaining 5-HT<sub>3</sub> RA prescriptions for CINV were for granisetron (22/318) and palonosetron (2/318). Of the ondansetron prescribed for CINV, the average duration dispensed was 5.3 days (95% CI 4.62-6.04).

**Conclusion:** Real-World evidence of 5-HT<sub>3</sub> RA use demonstrates that the most commonly prescribed agent is ondansetron. When prescribed for cancer-related emesis, an average of 5.3 days of ondansetron was dispensed, significantly different from the guideline-recommended 1 day use for CINV.

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## Educational Impact and Registrant Perspectives for an Online Fundamental Oncology Pharmacy Conference in Canada

**Objective:** Oncology Fundamentals Day (OFD) was an online conference delivering introductory level oncology pharmacy education. Our objectives included assessment of OFD program satisfaction, the impact of OFD on knowledge and confidence, practice characteristics of attendees, and considerations for future OFD offerings.

**Design:** All 263 registrants of OFD were invited by a third party to complete a voluntary and anonymous survey designed on Survey Monkey®. This study plan was approved by the University of Alberta REB.

**Results:** Sixty-three registrants completed the survey and 59 met inclusion criteria. All respondents (100%) indicated they liked the online format. Self assessed moderate to substantial improvement in knowledge was reported in 46 respondents (78%) for oncology diseases, 37 respondents (63%) for oncology pharmacotherapy, and 41 respondents (69%) for chemo-toxicity topics. Twenty-five (42%) had practice characteristics of the target audience. Of these, 24 (96%) felt content complexity was appropriate, 24 (96%) would recommend OFD to colleagues and 20 (80%) noted improved confidence.

**Conclusion:** The OFD format and educational content was well received and improved oncology knowledge and confidence for most participants. Feedback provides support to offer OFD again with minor modifications. Strategies should be explored to better recruit participants with a non-oncology background.

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## A Cross-Sectional National Study of the Adherence of Cancer Centres to 5-HT<sub>3</sub> Receptor Antagonist Dosing Guidelines in Highly Emetogenic Chemotherapy Regimens

**Objective:** To determine to what degree cancer centres in Canada adhere to single-day 5-HT<sub>3</sub> antagonist dosing guidelines in highly emetogenic chemotherapy (HEC) regimens, and to determine the most commonly used antiemetic prophylactic regimens in patients receiving HEC.

**Design:** A web-based survey consisting of 9 closed-ended, multiple choice questions on use of antiemetic regimens was disseminated to pharmacists at 45 cancer centres across Canada. Data was collected and analyzed descriptively.

**Results:** 43 useable responses were gathered from the survey. 34 responders (79.07%) reported seeing multi-day dosing of 5-HT<sub>3</sub> antagonists at least 25% of the time, and 18 responders (41.86%) reported seeing multi-day dosing at least 50% of the time. 29 responders (67.44%) reported having a standard prophylactic regimen. Of these, 9 reported having a standard containing multi-day 5-HT<sub>3</sub> dosing. The most common regimen contained dexamethasone, ondansetron, and aprepitant.

**Conclusion:** The majority of cancer centres in Canada have a standard prophylactic regimen for nausea in HEC. Many centres in Canada are using multi-day 5-HT<sub>3</sub> antagonists in contravention of published guidelines.

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## Canadian Real-World Experience with Everolimus in Combination with Exemestane in Post-Menopausal HR+ HER2- Advanced Breast Cancer Women – 1<sup>st</sup> Subgroup Baseline Analysis from the Treat ER+IGT Canadian Prospective Observational Study (NCT02753686)

**Objective & Design:** This exploratory subgroup analysis describes the baseline characteristics and adverse event (AE) prevention strategies adopted by multidisciplinary teams from 10 Canadian academic and community centers since March 2016 upon initiation of everolimus (EVE) in combination with exemestane (EXE).

**Results:** Baseline characteristics (n=29) include: median age – 63 (39-80); family history of BC – 38%; ECOG 0-1 – 86%; median time since primary BC diagnosis – 6 years; median time since advanced BC diagnosis – 1 year (0-3.5); line (L) of metastatic therapy at enrollment: 17% 1L, 55% 2L, 28% 3L. Sites of metastases: bone only – 31%; visceral only – 45%; bone+visceral – 21%. EVE start dose: 10mg – 76%, 7.5mg – 4%, 5mg – 17%; 86% patients educated on treatment risks/benefits and AE management by treating physician/nurse/pharmacist; 41% provided patient-tailored AE management information / kit; 24% enrolled in AfiniTRAC® or center-specific patient call-back support program; 52% of patients prescribed prophylactic (38%) or proactive (14%) use of steroid-based mouthwash for the prevention of EVE-related stomatitis.

**Conclusion:** The majority of EVE+EXE treated patients have good performance status, predominantly visceral metastatic disease and receive treatment mostly in 2L+ with half of patients prescribed prophylactic/proactive steroid-based mouthwash for stomatitis prevention.

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## Adherence to Acute Chemotherapy Induced Nausea and Vomiting Prophylaxis Guidelines at Canadian Pediatric Hospitals

**Objective:** In 2012 the Pediatric Oncology Group of Ontario published the first guidelines addressing Prophylaxis of Chemotherapy Induced Nausea and Vomiting (CINV) in Children. Our primary objective was to evaluate the adherence to these guidelines at 4 Canadian pediatric hospitals. Secondary objectives included incidence of complete control of CINV, frequency of vomiting episodes and the number of breakthrough medications administered to pediatric inpatients. Guideline adherence was examined for impact on CINV outcome measures.

**Design:** A multi-site retrospective chart review of 204 chemotherapy naïve pediatric patients receiving highly or moderately emetogenic chemotherapy was performed at 4 Canadian institutions between 2012 and 2015.

**Results:** Adherence to guidelines for agents used for CINV prophylaxis was low (28.9%). The mean frequency of emetic episodes and breakthrough medications is reported as 3 episodes and 7 doses per chemotherapy course respectively. Guideline implementation strategy differed amongst the four sites, with no differences noted in adherence.

**Conclusion:** At four Canadian pediatric institutions, guideline adherence for CINV prophylaxis appears to be low and reports of CINV remain high. Patients adherent to guidelines experienced less vomiting in the first 24 hours post chemotherapy.

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## **Clinical Incidence of Febrile Neutropenia in Early Stage Breast Cancer Patients (ESBC) Receiving Adjuvant FEC-D Treatment at an Outpatient Ambulatory Care Centre**

**Objective:** The aim of our study was to determine the frequency of febrile neutropenia in patients receiving adjuvant FEC-D chemotherapy for early stage breast cancer, and to review our granulocyte-colony stimulating factor (G-CSF) dosing strategy to determine the best possible schedule.

**Design:** Using our G-CSF monitoring program database, patient profiles were extracted for ESBC patients receiving FEC-D chemotherapy. Patients were screened for adjuvant intent and added to the study population. A retrospective analysis was conducted to assess incidences of FN, FN-related hospitalizations, and number of G-CSF doses administered each cycle.

**Results:** From January 2012 to January 2015, 79 patient profiles were analyzed. In total 16 (20%) women developed febrile neutropenia, however none resulted in a treatment delay due to the 21-day nature of the FEC-D cycle. FN-related hospitalizations (n=13) ranged from 4 to 7 days in length. Average number of G-CSF doses during FEC portion was 8 and 6 during (D)ocetaxel portion.

**Conclusion:** The incidence of febrile neutropenia was within the range of 18-36% as reported in other Canadian centre studies. Primary prophylaxis of G-CSF is recommended for ESBC patients receiving adjuvant FEC-D chemotherapy to prevent FN-related hospitalization.

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## Validation of a Novel Trastuzumab-Induced Cardiotoxicity Prediction Tool for Breast Cancer Patients

**Introduction:** Adjuvant trastuzumab improves overall survival in breast cancer patients but has been associated with an increased risk of cardiovascular events, most notably heart failure. A baseline risk prediction tool was developed at The Ottawa Hospital Cancer Centre (TOHCC) to identify breast cancer patients receiving trastuzumab based therapy who are at risk of experiencing cardiotoxicity.

**Design & Objective:** A retrospective chart review of 193 patients was conducted in order to validate the TOHCC prediction tool in a new sample of patients. External validation of two recently developed US prediction models was also conducted.

**Results:** We calculated a specificity and negative predictive value of the TOHCC prediction tool at 84.2% (95% CI: 77.6 to 89.5%) and 84.7% (95% CI: 78.3 to 89.5%), respectively. All three prediction tools had similar specificity and negative predictive values.

**Conclusion:** All three prediction tools achieved high specificity and negative predictive values. This suggests that these tools could potentially identify patients at lower risk of having a cardiovascular event. Further prospective trials examining outcomes of less frequent cardiovascular monitoring in low risk patients should be performed in order to optimize efficiency and resource use in clinical practice.

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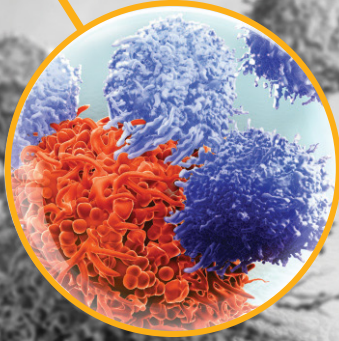
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