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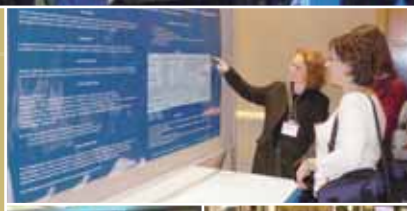

CJHP JCPH

The Canadian Journal of Hospital Pharmacy
Le journal canadien de la pharmacie hospitalière

Vol. 60, Supplement 1 (PPC), January 2007
Vol. 60, Supplément 1 (CPP), janvier 2007

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January 27th - January 31st, 2007

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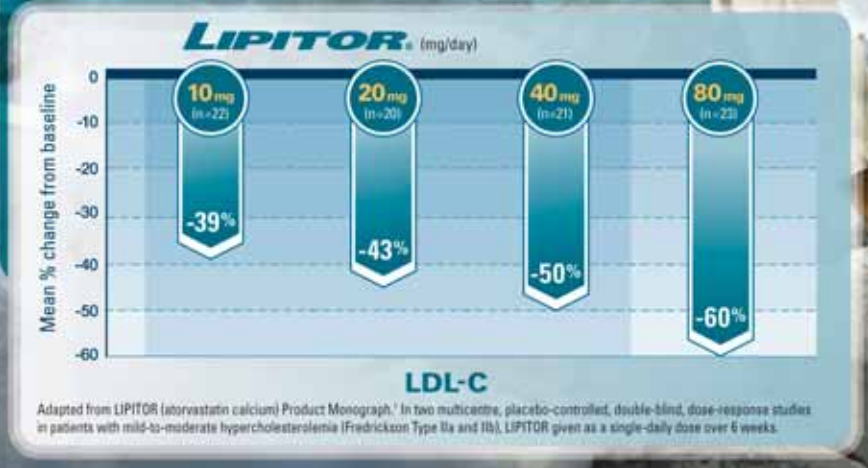

Adapted from LIPITOR (atorvastatin calcium) Product Monograph.[1] In two multicentre, placebo-controlled, double-blind, dose-response studies in patients with mild-to-moderate hypercholesterolemia (Fredrickson Type IIa and IIb), LIPITOR given as a single-daily dose over 6 weeks.

- **LIPITOR® is indicated to reduce the risk of MI and stroke in patients with type 2 diabetes and hypertension without CHD but with other risk factors[2]**
- **LIPITOR® is supported by 5 million patient-years of therapy in Canada[3‡]**

LIPITOR is an HMG-CoA reductase inhibitor (statin). LIPITOR is indicated as an adjunct to lifestyle changes, including diet, for the reduction of elevated total cholesterol (total-C), LDL-C, TG and apolipoprotein B (apo B) in hyperlipidemic and dyslipidemic conditions (including primary hypercholesterolemia, combined [mixed] hyperlipidemia, dysbetalipoproteinemia, hypertriglyceridemia and familial hypercholesterolemia) when response to diet and other non-pharmacological measures alone has been inadequate.

LIPITOR is also indicated as an adjunct to diet to reduce total-C, LDL-C and apo B levels in boys and postmenarchal girls, 10 to 17 years of age, with heterozygous familial hypercholesterolemia, if after an adequate trial of diet therapy the following findings are still present: a) LDL-C remains ≥4.9 mmol/L, or b) LDL-C remains ≥4.1 mmol/L and: (i) there is a positive family history of premature cardiovascular disease, or (ii) two or more other CVD risk factors are present in the pediatric patient.

LIPITOR also raises HDL-cholesterol and therefore lowers the LDL-C/HDL-C and total-C/HDL-C ratios (Fredrickson Type IIa and IIb).

LIPITOR is indicated to reduce the risk of myocardial infarction in adult hypertensive patients without clinically evident coronary heart disease, but with at least three additional risk factors for coronary heart disease such as age ≥55 years, male sex, smoking, type 2 diabetes, left ventricular hypertrophy, other specified abnormalities on ECG, microalbuminuria or proteinuria, ratio of plasma total cholesterol to HDL-cholesterol ≥6 or premature family history of coronary heart disease.

LIPITOR is also indicated to reduce the risk of myocardial infarction and stroke in adult patients with type 2 diabetes mellitus and hypertension without clinically evident coronary heart disease, but with other risk factors such as age ≥55 years, retinopathy, albuminuria or smoking.

Very rare cases of rhabdomyolysis with acute renal failure secondary to myoglobinuria have been reported with LIPITOR and with other HMG-CoA reductase inhibitors.

Patients who develop any signs or symptoms suggestive of myopathy should have their CK levels measured. LIPITOR therapy should be discontinued if markedly elevated CK levels are measured or myopathy is diagnosed or suspected.

See Prescribing Information for complete warnings, precautions, dosing and administration.

Less than 2% of patients discontinued therapy due to adverse experiences. Most common adverse effects vs. placebo occurring in patients at an incidence ≥1% were constipation (1% vs. 1%), diarrhea (1% vs. 1%), dyspepsia (1% vs. 2%), flatulence (1% vs. 2%), nausea (1% vs. 0%), headache (1% vs. 2%), pain (1% vs. <1%), myalgia (1% vs. 1%) and asthenia (1% vs. <1%). The adverse events reported in ≥1% of boys and postmenarchal girls (10-17 years of age) were abdominal pain, depression and headache.

LIPITOR is contraindicated: During pregnancy and lactation; active liver disease or unexplained persistent elevations of serum transaminases exceeding 3 times the upper limit of normal; hypersensitivity to any component of this medication.

Lipid levels should be monitored periodically and, if necessary, the dose of LIPITOR adjusted based on target lipid levels recommended by guidelines. The recommended starting dose of LIPITOR is 10 or 20 mg once daily, depending on patient's LDL-C reduction required. Patients who require a large reduction in LDL-C (more than 45%) may be started at 40 mg once daily. The dosage of LIPITOR should be individualized according to the baseline LDL-C, total-C/HDL-C ratio and/or TG levels to achieve the recommended target lipid values at the lowest dose needed to achieve LDL-C target. The pediatric dosage is 10 to 20 mg.

Caution should be exercised in severely hypercholesterolemic patients who are also renally impaired, elderly, or are concomitantly being administered digoxin or CYP 3A4 inhibitors.

Liver function tests should be performed before the initiation of treatment, and periodically thereafter. Special attention should be paid to patients who develop elevated serum transaminase levels, and in these patients, measurements should be repeated promptly and then performed more frequently.

If increases in alanine aminotransferase (ALT) or aspartate aminotransferase (AST) show evidence of progression, particularly if they rise to greater than 3 times the upper limit of normal and are persistent, the dosage should be reduced or the drug discontinued.

LIPITOR, as well as other HMG-CoA reductase inhibitors, should be used with caution in patients who consume substantial quantities of alcohol and/or have a past history of liver disease.

‡ A patient-year represents the total time of exposure to LIPITOR as defined by the sum of each patient's time on LIPITOR.[1]

References: 1. LIPITOR (atorvastatin calcium) Product Monograph, Pfizer Canada Inc., November 2005. 2. IMS Health, IMS MIDAS™ (Standard Units: Year 1997 through to April 2005). 3. Simon Day. *Dictionary for Clinical Trials*, 1999. John Wiley & Sons Ltd. 137-38.

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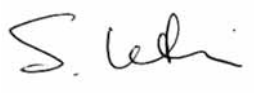
The 2007 conference promises to be phenomenal! Over the last 10 months, CSHP's Educational Services Committee has worked to assemble an impressive faculty of pharmacy specialists and develop a program of exceptional educational value.

This conference is designed to maximize your opportunities for professional development, networking, and socializing with practitioners from across the country. It is our hope that you are able to take full advantage of the 2007 offerings – and enjoy yourself in the process.

At any time throughout the conference, the Officers and staff of CSHP are available to you. Please let us know if we can answer any of your questions, address any of your concerns, or be of assistance in any way. Be sure to take a few minutes and stop by the CSHP booth during the exhibits program and say hello.

We look forward to welcoming each of you to another spectacular conference.

Thank you for your ongoing support of CSHP.



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Chers (ères) collègues,

Au nom des members du Bureau de direction, du Conseil et du personnel de la Société canadienne des pharmaciens d'hôpitaux, je suis heureuse de vous souhaiter la bienvenue à la 38e Conférence annuelle sur la pratique professionnelle de la SCPH.

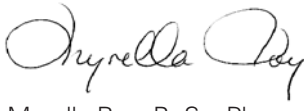
La conférence 2007 promet d'être formidable. Au cours des dix derniers mois, le Comité des services éducatifs de la SCPH s'est affairé à rassembler un groupe impressionnant d'enseignants spécialisés en pharmacie et à élaborer un programme d'une valeur éducative exceptionnelle.

Cette conférence est destinée à maximiser les possibilités de perfectionnement professionnel, de réseautage et de rencontre avec d'autres praticiens de toutes les régions du pays. Nous espérons que vous pourrez tirer pleinement profit de ce que vous offre la Conférence de 2007 et que vous prendrez le temps de vous divertir.

Nous vous rappelons qu'au cours de cette conférence, les membres du Bureau de direction et le personnel de la SCPH seront à votre entière disposition. Nous pourrons répondre à vos questions, discuter des sujets qui vous intéressent ou vous aider au besoin. Pendant le programme d'exposition, assurez-vous d'effectuer un arrêt au stand de la SCPH et de nous dire bonjour !

Nous sommes impatients de vous accueillir à cette autre conférence exceptionnelle et vous remercions de votre appui soutenu à la SCPH.

Shallen Letwin,
B. Sc. Phm., Pharm. D.,
FCSHP
Président de la SCPH



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1. NIOSH Alert (2004): Preventing occupational exposure to antineoplastic and other hazardous drugs in health care settings. http://www.cdc.gov/niosh/docs/2004-165

2. Connors TH et al. Surface contamination of chemotherapy drug vials and evaluation of new vial-cleaning techniques- Results of three studies. *Am J Health Syst Pharm.* 2005;62(5)-475-84.

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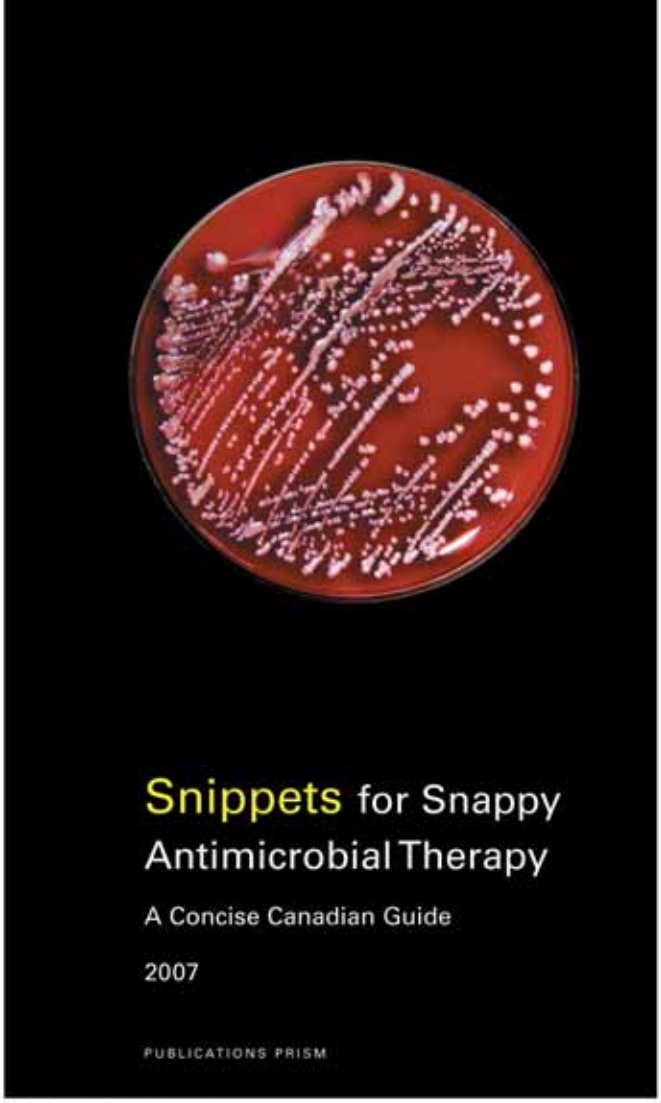

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* Shipping and handling rates subject to change without notice. Inquire for international shipping and handling rates.

Qty ____ × $34.95 = _____

Shipping and handling* + $7.00

Sub Total = _____

GST × 6% + _____

PST + $0.56

Total = _____

2006/2007 Awards Committee
Comité de prix 2006/2007

Sincere appreciation is extended to the Awards Committee and to our 2006/2007 Award Appraisers.

Chairperson/Présidente

Rosemary Zvonar

Members/Membres

Mario Bédard
Caroline Cheng
Dinie Engels
Frances Hall
Alexander Kuo
Kurt Schroeder

2006/2007 Awards Program
Programmes des prix 2006/2007

Clinical Pharmacy Program Award

Sponsored by Bristol-Myers Squibb Canada
$1,500

Innovation in Safe Medication Practices Award

Sponsored by Baxter Corporation
$1,500

Long Term Health Care Award

Sponsored by Pfizer Canada Inc.
$2,000

Management Issues in Pharmaceutical Care Award

Sponsored by Apotex Inc.
$1,500

New Programs in Patient Counselling Award

Sponsored by Novopharm Limited
$1,500

Oncology Award

Sponsored by Mayne Pharma (Canada) Inc.
$1,500

Pharmacoeconomics Award

Sponsored by Novartis Pharma Canada Inc.
$1,500

Rational Drug Use Award

Sponsored by Merck Frosst Canada Ltd.
$1,500

Specialties in Pharmacy Practice Award

Sponsored by Hoffmann-La Roche Limited
$1,500

Specialty Practice in Cardiology Award

Sponsored by sanofi-aventis Canada Inc.
$1,500

Tribute to Appraisers
Homage aux experts

Many thanks to the appraisers of this year's award submissions. We are very grateful to you for sharing your time and expertise in support of the CSHP Awards Program. Without your dedicated efforts on the Society's behalf, the program would not exist.

Alison Alleyne
Trudy Arbo
Rosemary Bacovsky
Jeff Barnett
Sabrina Boodhan
Annie Brooks
Glen Brown
Lauren Brown
Claudia Bucci
Allison Callaghan
Jeff Chan
Clarence Chant
Heather Chase
Elaine Chong
Judy Chong
Mark Collins
Céline Corman
Nathalie Dayneka
Mário de Lemos
Edward Dillon
Lisa Dolovich
Anar Dossa
Douglas Doucette
Barb Evans
Olavo Fernandes
Michelle Foisy
Margaret Gray
Susan Halasi
Joanne Holmes
Nicholas Honcharik
Cynthia Jackevicius
Derek Jorgenson
Christopher Judd
Jean-Yves Julien
Garry King
Sheri Koshman
Alexander Kuo
Anisha Lakhani
Cecilia Laskoski
Tim Lau
Jaclyn LeBlanc
Larry Legare
Peter Loewen
Patricia Ludwig
Barry Lyons
Janice Ma
Mark Makowsky
Swasti Bhajan Mathur
Lisa McCarthy
Karen McDermaid
Debra Moy
Carmine Nieuwstraten
Cali Orsulak
Glen Pearson
Terri Schindel
Blair Seifert
Yvonne Shevchuk
Judith Soon
Roy Steeves
Sana Rikabi Sukkari
Daniel Thirion
Joyce Totton
Louanne Twaites
Amanda Ung
Régis Vaillancourt
Kerry Wilbur
Sharon Yamashita
Peter Zed
Rosemary Zvonar

If you are interested in acting as an appraiser for the 2007/2008 Awards Program, please contact Gloria Day at the National office by telephone, (613) 736-9733, ext. 231 or by e-mail, gday@cshp.ca.

Upcoming Events/ Événements à venir

Professional Practice Conference (PPC)
January 27 to January 31, 2007
Westin Harbour Castle
Toronto, Ontario
Exhibit – yes
Attendance 1000 – 1200

Professional Practice Conference (PPC)
January 26 to 30, 2008
Sheraton Centre Toronto Hotel
Toronto, Ontario
Exhibits – yes
Attendance 1000 – 1200

Professional Practice Conference (PPC)
January 31 to February 4, 2009
Sheraton Centre Toronto Hotel
Toronto, Ontario
Exhibits – yes
Attendance 1000 – 1200

Professional Practice Conference (PPC)
January 30 to February 3, 2010
Sheraton Centre Toronto Hotel
Toronto, Ontario
Exhibits – yes
Attendance 1000 – 1200

Professional Practice Conference (PPC)
January 29 to February 2, 2011
Sheraton Centre Toronto Hotel
Toronto, Ontario
Exhibits – yes
Attendance 1000 – 1200

Annual General Meeting (AGM)
August 11 to 14, 2007
Delta Regina
Regina, Saskatchewan
Exhibits – yes
Attendance 250 – 300

Annual General Meeting (AGM)
August 9 to 12, 2008
Hilton Saint John
Saint John, New Brunswick
Exhibits - yes
Attendance 250 - 300

Annual General Meeting (AGM)
August 8 to 11, 2009
Delta Winnipeg
Winnipeg, Manitoba
Exhibits - yes
Attendance 250 - 300

Annual General Meeting (AGM)
August 7 to 10, 2010
TBA
Halifax, Nova Scotia
Exhibits - yes
Attendance 250 – 300

Annual General Meeting (AGM)
August 6 to 9, 2011
TBA
Vancouver, BC
Exhibits - yes
Attendance 250-300

Satellite Symposiums/ Symposiums satellite

CSHP would like to thank the following organizations for their participation in conjunction with the PPC 2007:

- Canadian Cardiovascular Pharmacists Network
- Canadian Association of Pharmacy in Oncology
- Merck Frosst Canada Ltd.
- sanofi-aventis Canada Inc.
- Cardiology Pharmacy Specialty Network

  Sponsored by sanofi-aventis Canada Inc.
- Geriatric Pharmacy Specialty Network

  Sponsored by Pfizer Canada Inc.

Registration is required. Visit the CSHP web site (www.cshp.ca) to download the satellite registration form. See the program section for more details.

For further information on upcoming events or satellite symposium opportunities, please contact Desarae Davidson CSHP National Office. Tel.: (613) 736-9733, ext. 229 • Fax: (613) 736-5660 • E-mail: ddavidson@cshp.ca

Continuing Education Credits

The Educational Services Committee

The Educational Services Committee (ESC) of CSHP has been working for approximately 10 months on the content and format of PPC 2007. They also work on the Annual General Meeting, in conjunction with the local host committee and the national office. The ESC is comprised of a core committee of 15 hospital pharmacists as well as 8 corresponding members from the CSHP branches.

C.C.C.E.P.
Canadian Council on Continuing Education in Pharmacy
Conseil canadien de l'éducation permanente en pharmacie

Goal and objectives for the 2007 PPC Program

Goal:

To provide registrants with quality educational sessions.

Objectives:

- To provide registrants with educational sessions which inform, educate and motivate clinical practitioners and managers.
- To provide leadership in hospital pharmacy practice by presenting sessions on innovative pharmacists' roles, pharmacy practice and pharmacy programs.
- To promote life-long learning skills through active participation in problem-based workshops.
- To provide registrants with networking and sharing opportunities through the exhibits program, poster sessions and round table discussions.
- To promote excellence in pharmacy practice through oral and poster presentations on original work and award winning projects.
- To provide an opportunity for Pharmacy Specialty Networks to meet.

Crédits de formation continue

Le Comité des services éducatifs

Le comité des services éducatifs a travaillé environ 10 mois sur le contenu et le forme de la CPP 2007. Ils travaillent aussi l'Assemblée générale annuelle dans conjunction avec le comité d'oecueil et le personnel de la SCPH. Le comité comprend 15 membres principaux et 8 membres correspondants des sections de la SCPH.

But et objectifs du programme de la CPP 2007

But :

Présenter des conférences éducatives de qualité aux participants.

Objectifs :

- Présenter aux personnes inscrites des conférences éducatives susceptibles d'informer, d'instruire et de motiver les cliniciens et les gestionnaires.
- Orienter la pratique de la pharmacie d'hôpital en présentant des conférences sur les nouveautés touchant le rôle du pharmacien, la pratique de la pharmacie et les programmes de pharmacie.
- Favoriser des aptitudes d'apprentissage permanentes par une participation active à des ateliers de formation centrés sur des problèmes.
- Donner aux participants l'occasion d'établir des réseaux et de partager grâce au salon des exposants, aux séances d'affichage et aux tables rondes.
- Promouvoir l'excellence dans la pratique de la pharmacie par des présentations orales et des séances d'affichage sur des travaux originaux et des projets primés.
- Donner l'occasion aux réseaux de spécialistes en pharmacie de se réunir.

Program/Programme

Saturday, January 27
Samedi 27 janvier

13:00 – 17:00 **Stakeholder Consultation Workshop: 2010 CHPRB (Residency) Accreditation Standards**

DOCKSIDE I

15:00 – 17:00 **Registration**
Inscription

TOP OF ESCALATORS – HOTEL SIDE

17:30 – 20:00 **Awards Ceremony/Opening Reception**

Everyone welcome

Cérémonie de remise des prix/Réception d'ouverture

Bienvenue à tous

REGATTA

Sunday, January 28
Dimanche 28 janvier

07:30 – 17:00 **Registration**
Inscription

METROPOLITAN FOYER

08:45 – 09:00 **Opening Remarks**
Remarques préliminaires

METROPOLITAN WEST

09:00 – 10:00 **ASHP 2015 Inception & Progress**

METROPOLITAN WEST

Charles Myers, MS, MBA
American Society of Health-System Pharmacists
Bethesda, MD

CSHP 2015 – You Can Make It Happen!

METROPOLITAN WEST

Carolyn Bornstein, BScPhm
Southlake Regional Health Centre
Newmarket, ON

10:00 – 10:45 **Break/Posters**
Pause/Affiches

HARBOUR B & FOYER

10:45 – 11:30 **Concurrent Sessions**
Sessions concomitantes

1. **Transitioning into an Innovative Primary Care Practice**

   PIER 2/3

   Lisa Kwok, PharmD
   North York General Hospital
   Toronto, ON

2. **An Update on the Treatment of Multiple Myeloma**

   PIER 7/8

   Carlo De Angelis, PharmD
   Sunnybrook Health Sciences Centre
   Toronto, ON

3. **Recent Cardiology Guidelines**

   PIER 4/5

   Heather Kertland, PharmD
   St. Michael's Hospital
   Toronto, ON

11:40 – 12:25 **Concurrent Sessions**
Sessions concomitantes

1. **Clinical Pearls**
   Trésors cliniques

   PIER 4/5

   a. **The Bottom Line on Bosentan for Pulmonary Hypertension**

      Brenda Kisic, BScPhm
      University Health Network
      Toronto, ON

   b. **What is New with the 2006 CHEP Hypertension Guidelines: Clinical Pearls for Pharmacists**

      Lori MacCallum, PharmD
      St. Michael's Hospital
      Toronto, ON

   c. **Intensive Glycemic Control in the ICU: How Sweet it is?**

      Clarence Chant, PharmD
      St. Michael's Hospital
      Toronto, ON

2. **Lymphoma 101: A Primer for Non-Oncology Pharmacists**

   PIER 7/8

Celina Dara, PharmD
St. Michael's Hospital
Toronto, ON

3. **Pharmacy Technicians: Recognition as a Health Professional and the Regulatory Process in Canada**

PIER 2/3

Alan Samuelson, BScPhm
College of Pharmacists of British Columbia
Vancouver, BC

12:30 – 14:00 **Satellite Symposiums** (luncheon included)
Symposiums satellites (déjeuner inclus)

HARBOUR B

Pharmacists Leading Change in Cardiovascular Health

Hosted by: Canadian Cardiovascular Pharmacists Network

HARBOUR C

Pharmacogenomics in Oncology

Hosted by: Canadian Association of Pharmacy in Oncology

REGATTA

Incretins: Physiologic Role and Dysfunction in Type 2 Diabetes

Hosted by: Merck Frosst Canada Ltd.

14:10 – 14:55 **New Anti-Infectives on the Canadian Horizon**

METROPOLITAN WEST

Joseph Kuti, PharmD
Hartford Hospital
Hartford, CT

15:00 – 17:00 **Workshops** (registration is required, see PPC registration form)
Ateliers (inscription requise, voir le formulaire d'inscription de la CPP)

1. **The Art and Science of Peerless Peer Review**

PIER 9

Mary H.H. Ensom, PharmD, FCSHP
Children's and Women's Health Centre of BC
Vancouver, BC

2. **A Practical Approach to Managing Inflammatory Bowel Disease Patients**

PIER 7/8

Co Pham, PharmD
Montreal General Hospital
Montréal, QC

3. **Acid-Base Disturbances – A pIACIDly BASE-ic Approach to Interpretation, Diagnosis, and Treatment for Clinical Pharmacists**

PIER 4

Sean Gorman, PharmD
Vancouver Coastal Health Authority
Vancouver, BC

4. **Antimicrobial Drug Use Measurement and National Hospital Benchmarking**

PIER 5

Dominique L. Monnet, PharmD, PhD
Statens Serum Institut
Copenhagen, Denmark

Heather Lummis, BScPhm
Capital Health
Halifax, NS

Donna Lowe, PharmD
University Health Network
Toronto, ON

5. **Don't Just Talk the Talk: Delivering Effective, Evidence-Based Presentations**

PIER 2/3

Richard Slavik, PharmD, FCSHP
Vancouver Coastal Health Authority
Vancouver, BC

15:00 – 17:00 **PSN Session – Infectious Disease Session RSP – Infectiologie**

REGATTA

Optimizing β-lactam Pharmacodynamics

Joseph Kuti, PharmD
Hartford Hospital
Hartford, CT

The ABC's of Hepatitis

Curtis Cooper, MD, FRCPC
The Ottawa Hospital
Ottawa, ON

17:00 – 18:00 **Wine & Chat**
Vin et causette

HARBOUR C

17:30 – 19:30 **Career Opportunities Evening**
Soirée de perspectives d'emploi

HARBOUR A/B

Monday, January 29
Lundi 29 janvier

07:30 – 17:00 **Registration**
Inscription

METROPOLITAN FOYER

08:30 – 10:00 **Keeping Current with Medication Safety Research: What Do Hospital Pharmacists Need to Know?**

METROPOLITAN WEST

Neil MacKinnon, PhD, FCSHP
Dalhousie University
Halifax, NS

New Fellows Presentation

10:00 – 10:30 **Break/Exhibits/Posters**
Pause/Kiosques/Affiches

METROPOLITAN CENTRE/EAST

10:30 – 11:15 **Concurrent Sessions**
Sessions concomitantes

1. **Oral Presentations**
   Présentations orales

   PIER 9

2. **Leadership Pearls**
   Trésors de leadership

   PIER 4/5

   Tom Paton, PharmD
   Sunnybrook Health Sciences Centre
   Toronto, ON

   Jean-François Bussières, BPharm, FCSHP
   Centre hospitalier universitaire Sainte-Justine
   Montréal, QC

   Carolyn Bornstein, BScPhm
   Southlake Regional Health Centre
   Newmarket, ON

3. **Home Care Pharmacists: Practices and Patient Outcomes from Coast to Coast**

   PIER 2/3

   Stacey MacAulay, PharmD
   South-East Regional Health Authority
   Moncton, NB

   Karen Cameron, BScPhm
   Scarborough Community Care Access Centre
   Scarborough, ON

   Carla Ambrosini, BScPhm
   Fraser Health Authority
   Vancouver, BC

11:25 – 12:10 **Concurrent Sessions**
Sessions concomitantes

1. **Oral Presentations**
   Présentations orales

   PIER 9

2. **Round Tables**
   Tables rondes

   a. **Pharmacist's in Home Care: Making it Happen!**

      PIER 4

      Doris Nessim, BScPhm, MA(Ed)
      Chair, Home Care Pharmacy Specialty Network
      North York General Hospital
      Toronto, ON

   b. **Sharing Practices: Medication Reconciliation at Hospital Admission**

      PIER 7/8

      Karen McFarlane, BScPhm
      Markham Stouffville Hospital
      Markham, ON

Georgina Rizk, BScPhm
Markham Stouffville Hospital
Markham, ON

c. **Development and Implementation of an Electronic Pharmacy Patient Profile**

PIER 2/3

Jin Huh, BScPhm
University Health Network
Toronto, ON

Ada Seto, BScPhm
University Health Network
Toronto, ON

d. **Controversies in the Management of Solid Organ Transplant Patients: Sharing Practices**

PIER 5

Jennifer Harrison, BScPhm
University Health Network
Toronto, ON

12:15 – 14:15 **Lunch/Exhibits/Posters**
Déjeuner/Kiosques/Affiches

METROPOLITAN CENTRE/EAST

14:15 – 15:00 **To PharmD or not to PharmD, that is the Question: A National Update**

METROPOLITAN WEST

Nancy Waite, PharmD
University of Toronto
Toronto, ON

15:00 – 17:00 **Workshops** (registration is required, see PPC registration form)
Ateliers (inscription requise, voir le formulaire d'inscription de la CPP)

1. **Who's Your Daddy? A Conflict of Interest Discussion**

PIER 9

Robin Ensom, PharmD, FCSHP
Vancouver Coastal Health &
Providence Health Care
Vancouver, BC

2. **A Practical Approach to Managing Inflammatory Bowel Disease Patients**

PIER 7/8

Co Pham, PharmD
Montreal General Hospital
Montréal, QC

3. **Acid-Base Disturbances a pIACIDly Base-ic Approach to Interpretation, Diagnosis and Treatment for Clinical Pharmacists**

PIER 4

Sean Gorman, PharmD
Vancouver Coastal Health Authority
Vancouver, BC

4. **Antimicrobial Drug Use Measurement and National Hospital Benchmarking**

PIER 5

Dominique L. Monnet, PharmD, PhD
Statens Serum Institut
Copenhagen, Denmark

Heather Lummis, BScPhm
Capital Health
Halifax, NS

Donna Lowe, PharmD
University Health Network
Toronto, ON

5. **Don't Just Talk the Talk: Delivering Effective Evidence-Based Presentations**

PIER 2/3

Richard Slavik, PharmD, FCSHP
Vancouver Coastal Health Authority
Vancouver, BC

15:00 – 17:00 **PSN Session – Critical Care**
Session RSP – Soins critiques

METROPOLITAN WEST

Toxicology 101

Debra Kent, PharmD
BC Drug & Poison Information Centre
Vancouver, BC

Pharmacologic Strategies in the Management of Traumatic Brain Injury

Sharon Yamashita, PharmD, FCSHP
Sunnybrook Health Sciences Centre
Toronto, ON

18:00 – 19:00 **Reception/Silent Auction**
Everyone welcome

Réception/Vente aux enchères par écrit
Bienvenue à tous

HARBOUR A

19:00 – 22:00 **Research and Education Foundation Dinner with Keynote Speaker Mark Tewksbury, Olympic Gold Medallist**
Tickets available, see PPC registration form

Dîner de la Fondation pour la recherche et l'éducation avec le premier conférencier Mark Tewksbury, le Médaillé Olympique D'or
Billets disponibles, voir le formulaire d'inscription de la CPP

HARBOUR B

Tuesday, January 30
Mardi 30 janvier

07:30 – 17:00 **Registration**
Inscription

METROPOLITAN FOYER

08:30 – 10:00 **Update on Dyslipidemia: Are Pleotorpic Effects of Statins Relevant?**

METROPOLITAN WEST

Bill Semchuk, PharmD, FCSHP
Regina Qu'Appelle Health Region
Regina, SK

New Fellows Presentation

10:00 – 10:30 **Break/Exhibits**
Pause/Kiosques

METROPOLITAN CENTRE/EAST

10:30 – 11:15 **Concurrent Session**
Sessions concomitantes

1. **Oral Presentations**
   Présentations orales

   PIER 9

2. **Medication Reconciliation for Safer Health Care: Where Are We Now?**

   PIER 4/5

   Marg Colquhoun, BScPhm, FCSHP
   Institute for Safe Medication Practices Canada
   Toronto, ON

3. **Ensuring Access to Antidotes: The Capital Health Antidote Kit Project**

   PIER 7/8

   Theresa Hurley, BScPhm
   Capital District Health Authority
   Halifax, NS

4. **Medication Safety: Practical Tips from a Pediatric Point of View**

   PIER 2/3

   Roxane Carr, PharmD
   Children's and Women's Health Centre of BC
   Vancouver, BC

   Don Hamilton, BScPhm
   Children's and Women's Health Centre of BC
   Vancouver, BC

11:25 – 12:10 **Concurrent Sessions**
Sessions concomitantes

1. **Oral Presentations**
   Présentations orales

   PIER 9

2. **Round Tables**
   Tables rondes

   a. **Clinical Leadership Sharing Tips & Ideas for Mentoring Pharmacists**

      PIER 5

      Winnie Seto, PharmD
      The Hospital for Sick Children
      Toronto, ON

   b. **Challenges and Successes of Implementing the Reduction of High Cost Medications**

      PIER 4

      Gary Wong, BScPhm
      University Health Network
      Toronto, ON

3. **Update on the Use of Combination Therapies (Inhaled Corticosteroids – Long-Acting Beta$_2$-Agonists) in Asthma and COPD**

   PIER 7/8

   Marie-France Beauchesne, PharmD
   Hôpital du Sacré-Coeur de Montréal
   Montréal, QC

4. **Telepharmacy: Using Technology to Extend the Reach of Pharmacy Services**

   PIER 2/3

   Kevin McDonald, BScPhm
   The North West Company
   Ottawa, ON

12:15 – 14:15 **Lunch/Exhibits/Posters**
Déjeuner/Kiosques/Affiches

METROPOLITAN CENTRE/EAST

14:15 – 15:00 **Breaking New Ground: The Role of the Clinical Assistant**

METROPOLITAN WEST

Michael Namaka, PhD
University of Manitoba
Winnipeg, MB

15:00 – 17:00 **Workshops** (registration is required, see PPC registration form)
Ateliers (inscription requise, voir le formulaire d'inscription de la CPP)

1. **Applying Evidence-Based Medicine in Your Practice: Taking a Critical Look at Study Results**

   HARBOUR C

   Linda Levesque, PhD
   Queen's University
   Kingston, ON

2. **The Teen Challenge: Practical and Creative Strategies for Improving Medication Adherence**

   PIER 9

   Natalie Dayneka, PharmD, FCSHP
   Children's Hospital of Eastern Ontario
   Ottawa, ON

3. **Teaching Skills for Pharmacists**

   HARBOUR A

   Artemis Diamantouros, BScPhm, MEd
   Sunnybrook Health Sciences Centre
   Toronto, ON

   Brian Hardy, PharmD, FCSHP
   Sunnybrook Health Sciences Centre
   Toronto, ON

   Lisa Zhu, BScPhm
   Sunnybrook Health Sciences Centre
   Toronto, ON

4. **Patient Assessment: The Role of the Patient Interview**

   PIER 7/8

   Allan Mills, PharmD
   Trillium Health Centre
   Mississauga, ON

5. **Leading Positive Change: Tips for Effective Change Management**

   PIER 2/3

   Danny Nashman, MBA
   The Potential Group
   Toronto, ON

15:00 – 17:00 **PSN Session – Cardiology**
Session RSP – Cardiologie

PIER 4/5

Clinical Trials that Affect our Practice: A FIELD of DREAMs in a SPARCLing OASIS!

OASIS 5/6 Fondaparinux

Heather Kertland, PharmD
St Michael's Hospital
Toronto, ON

SPARCL – Statins / FIELD Fibrates

Nicole Bidwell, BSP
Regina Qu'Appelle Health Region
Regina, SK

Smoking Cessation Therapies

Claudia Bucci, PharmD
Sunnybrook Health Sciences Centre
Toronto, ON

DREAM – Glitazones

Kori Leblanc, BScPhm
University Health Network
Toronto, ON

17:00 – 19:00 **Satellite Symposium**
(dinner included)
Symposium satellite
(dîner inclus)

HARBOUR B

Anticoagulation Therapy in STEMI Patients: From Best Evidence to Best Practice

Hosted by: sanofi-aventis Canada Inc.

Wednesday, January 31
Mercredi 31 janvier

07:30 – 15:00 **Registration**
Inscription

TOP OF ESCALATORS – HOTEL SIDE

08:30 – 9:30 **Drug-Related Hospital Visits: An Underrecognized Epidemic**

METROPOLITAN WEST

Peter Zed, PharmD, FCSHP
Queen Elizabeth II Health Sciences Centre
Halifax, NS

09:30 – 10:15 **Storm Clouds on the Horizon: Pharmacists in Primary Health Care**

METROPOLITAN WEST

Derek Jorgenson, PharmD
Saskatoon Health Region
Saskatoon, SK

10:15 – 11:00 **Break/Posters**
Pause/Affiches

HARBOUR FOYER

11:00 – 11:45 **Concurrent Sessions**
Sessions concomitantes

1. **Recent Clinical Trials That May Change Your Practice**

   PIER 4/5

   Amy Sood, PharmD
   University of Toronto
   Toronto, ON

2. **Speaking to the Media: Tips on How to Get the Right Message Out; Well at Least Most of the Time**

   PIER 2/3

   James McCormack, PharmD
   University of British Columbia
   Vancouver, BC

Round Table
Table ronde

PIER 7/8

3. **Establishing a Pharmacy Practice in Primary Care: Challenges and Successes**

   Derek Jorgenson, PharmD
   Saskatoon Health Region
   Saskatoon, SK

   Shelley House, BScPhm
   Caroline Medical Group
   Burlington, ON

   Jeff Nagge, PharmD
   Centre for Family Medicine
   Kitchener, ON

11:55 – 12:40 **Concurrent Session**
Sessions concomitantes

1. **Women's Health Outcomes in an Ethnic Population: The Asian Women's Health Clinic**

   PIER 7/8

   Elaine Chong, PharmD
   Network Healthcare
   Vancouver, BC

2. **How much "Value" is there in Clinical Practice Guidelines?**

   PIER 4/5

   James McCormack, PharmD
   University of British Columbia
   Vancouver, BC

3. **Neonatal Pain: Baby Steps Forward**

   PIER 2/3

   Anna Taddio, PhD
   The Hospital for Sick Children
   Toronto, ON

12:40 – 14:10 **Satellite Symposiums**
(luncheon included)
Symposiums satellites
(déjeuner inclus)

HARBOUR B

The Looming Epidemic: Cardiometabolic Risk

Hosted by: Cardiology Pharmacy Specialty Network

Sponsored by: sanofi-aventis Canada Inc.

HARBOUR C

Incontinence Management in the Elderly: Strategies and Advancement in Management

Hosted by: Cardiology Pharmacy Specialty Network

Sponsored by: Pfizer Canada Inc.

14:15 – 15:00 **The Integrating Family Medicine and Pharmacy to Advance Primary Care Therapeutics Project: The Impact of IMPACT**

METROPOLITAN WEST

Lisa Dolovich, PharmD
McMaster University
Hamilton, ON

15:00 –17:00 **Workshops** (registration is required, see PPC registration form)
Ateliers (inscription requise, voir le formulaire d'inscription de la CPP)

1. **Applying Evidence-Based Medicine in Your Practice: Taking a Critical Look at Study Results**

   HARBOUR C

   Linda Levesque, PhD
   Queen's University
   Kingston, ON

2. **The Teen Challenge: Practical and Creative Strategies for Improving Medication Adherence**

   PIER 9

   Natalie Dayneka, PharmD, FCSHP
   Children's Hospital of Eastern Ontario
   Ottawa, ON

3. **Teaching Skills for Pharmacists**

   HARBOUR A

   Artemis Diamantouros, BScPhm, MEd
   Sunnybrook Health Sciences Centre
   Toronto, ON

   Brian Hardy, PharmD, FCSHP
   Sunnybrook Health Sciences Centre
   Toronto, ON

   Lisa Zhu, BScPhm
   Sunnybrook Health Sciences Centre
   Toronto, ON

4. **Patient Assessment: The Role of the Patient Interview**

   PIER 4/5

   Allan Mills, PharmD
   Trillium Health Centre
   Mississauga, ON

5. **Leading Positive Change: Tips for Effective Change Management**

   PIER 2/3

   Danny Nashman, MBA
   The Potential Group
   Toronto, ON

15:00 – 17:00 **PSN Session – Geriatrics**
Session RSP – Gériatrie

PIER 7/8

Managing Anemia in the Elderly

Marisa Battistella, PharmD
University Health Network
Toronto, ON

Neuropathic Pain Management – Identify & Treat It (Aggressively)

Donna Buna, PharmD
Vancouver Island Health Authority
Victoria, BC

17:00 **Close of the 38th Annual Professional Practice Conference**
Clôture de la 38e Conférence annuelle sur la pratique professionnelle

Sunday, January 28 • Dimanche 28 janvier

ASHP 2015 Inception and Progress

Charles E. Myers, MS, MBA, American Society of Health-System Pharmacists, Bethesda, Maryland

This session will share insights about why and how ASHP established the ASHP Health-System Pharmacy 2015 Initiative and will review the progress that is occurring to achieve the goals and objectives.

The ASHP Initiative is based on a vision for pharmacy practice in hospitals and health systems and provides some specific goals and objectives that are believed would (a) make the most difference in the care of patients and (b) would be the most useful in conveying the positive contributions of hospital and health-system pharmacy practitioners. The Initiative is similar in approach, but more modest in scale, compared to the US government's Health People 2010 Project.

The 6 goals and 31 objectives in the Initiative were developed with member input, including targets for performance. ASHP conducted surveys to determine baseline levels of performance shortly after launch and is now conducting periodic surveys to assess progress.

A crosswalk guide was developed to point out alignments with other national initiatives and to provide literature citations for evidence that pharmacy practitioners make a positive contribution to the achievement of specific objectives.

Goals and Objectives

1. To provide information and perspectives about the ASHP Health-System Pharmacy 2015 Initiative.
2. To highlight the opportunities for all hospital and health-system pharmacy practitioners, including inpatient, ambulatory care, clinical, and managerial staff to engage collectively in practice improvements with respect to the initiative's goals and objectives.
3. To celebrate with CSHP with respect to its launch of Canadian Hospital Pharmacy 2015.

Self-Assessment Questions

1. Why did ASHP launch the ASHP Health-System Pharmacy 2015 Initiative?
2. What is its relationship to the US Government's Healthy People 2010 Project?
3. Why did ASHP create a crosswalk document to accompany the Initiative?

CSHP 2015 – You Can Make it Happen!

Carolyn Bornstein, BScPhm, ACPR, Southlake Regional Health Centre, Newmarket, ON, & President Elect, CSHP

The purpose of this session is to introduce the CSHP membership to CSHP 2015. The speaker will describe the evolution of the Canadian document from the ASHP 2015 Initiative, highlighting the similarities, but also the uniqueness of the "Canadian" version.

CSHP 2015 challenges hospital pharmacists to strive for practice excellence with measurable targets set for the year 2015. It is a clinical tool for responsible patient care that focuses on effective, evidence-based and safe medication use. The goal of CSHP 2015 is to encourage all pharmacy practitioners, including the primary care pharmacist, to reflect on their current practices and to assist them in setting personal goals for practice excellence in the future. No doubt an investment of time and energy to evaluate how you deliver care and what changes and training is necessary to support practice excellence will be required. Who benefits from CSHP 2015? Pharmacy practice, but ultimately it will be our patients who will benefit the most.

CSHP 2015 consists of 6 goals and several supporting objectives. The goals target best medication use of hospitalized and non-hospitalized patients, evidence-based medication use, improving the safety of medication use including technology, and pharmacist involvement in public health initiatives. Measurable targets will be confirmed once baseline data is obtained. CSHP 2015 is a living, breathing document that all CSHP members are invited to embrace. We will share our successes and learn from each other. You can make it happen!

Goals and Objectives

1. To introduce CSHP 2015 to the CSHP membership.
2. To describe the evolution of CSHP 2015 from ASHP's 2015 Initiative, highlighting the similarities and differences.
3. To present the 6 goals of CSHP 2015 and how they align with the CSHP Mission, Values and Vision 2010.

Self-Assessment Questions

1. What is the goal of CSHP 2015?
2. What are the 6 goals of CSHP 2015 and how will they affect the way I practice?

3. What will my role be in changing hospital pharmacy practice by 2015?

Transitioning into an Innovative Primary Care Practice

Lisa Kwok, BScPhm, PharmD, North York General Hospital, Toronto, ON

The primary care landscape in Ontario has evolved with the introduction of family health teams which encompass physicians and allied health professionals working collaboratively to deliver patient care. Pharmacists are being sought to be a part of these teams, to utilize their knowledge and skills in medication management. This is a novel role for pharmacists and one that is continuing to develop.

In this session, the speaker will aim to provide personal experiences of integrating into primary care settings. Aspects to be presented include: initial steps/ getting started, services to offer, physician collaboration, challenges/ solutions and success stories. In addition, information on networks, resources, tools and other supports will be discussed briefly to help pharmacists who wish to transition into a primary care practice.

Goals and Objectives

1. To share pharmacist experience of transitioning and working in a primary care setting.
2. To provide information on resources and services that support pharmacists who are interested in working in primary care.

Self-Assessment Questions

1. What are some ideas I can implement or suggest which will ease the transition into a primary care setting?
2. What resources or supports are available to help me transition and integrate into a primary care setting?

An Update on the Treatment of Multiple Myeloma

Carlo De Angelis, RPh, PharmD, Sunnybrook Health Sciences Centre & Toronto Sunnybrook Regional Cancer Centre, Toronto, ON

Multiple myeloma is a condition characterized by the uncontrolled growth of malignant plasma cells. Principally a disease of the elderly the number of new cases of Multiple Myeloma has been increasing. Canadian cancer statistics estimate that approximately 1900 new cases will be diagnosed and 1300 patients will die of the disease in 2006. The management of multiple myeloma has changed dramatically in recent years, giving new hope to patients with this condition.

Autologous peripheral blood stem cell transplantation has emerged as an effective therapy for younger patients early in the disease process. For those not eligible for transplant, agents such as bortezomib, thalidomide and lenalinomide offer new therapeutic strategies.

Bortezomib a proteasome inhibitor is indicated for treatment of patients with relapsed multiple myeloma and those resistant to current therapy, or not eligible for transplant. Thrombocytopenia and peripheral neuropathy are important side effects of bortezomib requiring close monitoring.

Thalidomide and its analog lenalinomide have a direct cytotoxic affect and induce apoptosis of myeloma cells. They also have additional anti-angiogenic, anti-inflammatory and immunomodulatory properties. Both of these agents have demonstrated activity in refractory multiple myeloma either given as single agents or in combination. Thalidomide is available through a Health Canada Special Access Program. Lenalinomide may be available soon on the Canadian market. Both agents have similar side effect profiles including peripheral neuropathy, constipation, drowsiness and skin rash. Lenalinomide has the added toxicities of neutropenia and thrombocytopenia. Close monitoring and implementation of side effect prevention and management strategies allow patients to continue therapy.

Goals and Objectives

1. To provide pharmacists with an understanding of the role of bortezomib, thalidomide and lenalinomide in the management of multiple myeloma.
2. To provide pharmacists with an overview of the supportive care issues surrounding the use of bortezomib, thalidomide and lenalinomide in multiple myeloma.

Self-Assessment Questions

1. When in the disease process should patients with multiple myeloma receive bortezomib. thalidomide or lenalinomide.
2. What supportive care strategies can be used to prevent or ameliorate side effects associated with bortezomib, thalidomide and lenalinomide therapy.

Recent Cardiology Guidelines

Heather Kertland, St. Michael's Hospital and University of Toronto, Toronto, ON

In the last two years, all of the major cardiovascular guidelines have been upated; acute coronary

syndromes, atrial fibrillation, dyslipidemia, heart failure, secondary prevention of coronary and atherosclerotic disease and stroke. Many of these guidelines are Canadian so are easily applied in our local health care setting. The guidelines frequently provide a review of the pathophysiology of the disease state in addition to evidence based recommendations for diagnosis and treatment. The guidelines can be used to promote evidence-based practice. Additional tools may need to be developed to promote the use of the guidelines. Additional guidelines that identify how a pharmacist should care for a patient with hypertension have also been developed. Similar guidelines are in development for dyslipidemia.

Goals and Objectives

1. Discuss the highlights of the recent A fib, ACS, heart failure, lipid guidelines.
2. Identify how pharmacists can use these guidelines to improve patient care.

Self-Assessment Questions

1. Identify one change to each of the following guidelines
   a. Atrial Fibrillation
   b. Acute Coronary Syndromes
   c. Heart Failure
   d. Dyslipidemia
2. List two ways you can use these guidelines to promote best practice.

The Bottom Line on Bosentan for Pulmonary Hypertension

Brenda Kisic, BScPharm, University Health Network, Toronto, ON

Pulmonary Hypertension has long been a disease that has incurred considerable morbidity and mortality. Because the majority of cases are idiopathic in nature with few identifiable causes, effective therapies have been limited until recently. Growing insight into the pathophysiology of Pulmonary Hypertension has enabled the development of novel therapies that serve as a bridge to transplantation and ultimately that improve both the quality and duration of life for patients.

This session will briefly review the pathophysiology of Pulmonary Hypertension with a view to understand the different mechanisms of action of these novel therapies. Particular emphasis will be given to Bosentan and its role in the treatment of pulmonary hypertension compared to other therapies (i.e. sildenafil, prostacyclin). Clinical use, dosing, pharmacokinetics, and adverse effects of bosentan will be briefly described.

Goals and Objectives

1. To provide pharmacists with a working knowledge of Bosentan in the treatment of Pulmonary Hypertension.
2. To enable pharmacists to educate patients who are taking Bosentan.

Self-Assessment Questions

1. What is the role and effectiveness of Bosentan in the treatment of Pulmonary Hypertension?
2. What adverse effects may be experienced during treatment with Bosentan?

What is New with the 2006 CHEP Hypertension Guidelines: Clinical Pearls for Pharmacists

Lori MacCallum, BScPhm, PharmD, St. Michael's Hospital, Toronto, ON

Hypertension remains a significant public health problem and the burden is expected to continue to grow over the next 20 years. The Canadian Hypertension Education Program (CHEP) has a mandate to improve hypertension management, to develop tools to aid health care professionals and to evaluate the impact of their activities. 2006 was the seventh consecutive year that the CHEP updated the recommendations for hypertension management. This presentation will review the new key messages in the 2006 guidelines.

Intensive Glycemic Control in the ICU: How Sweet is it?

Clarence Chant, PharmD, St. Michael's Hospital, Toronto, ON

The issue of intensive glycemic control in the ICU has received widespread attention in the literature since the publication of the landmark Leuven trial in the surgical population. Since that time, a plethora of insulin nomograms that have been validated in different manners at various institutions in a variety of critically ill patient population throughout the world have been published or presented. However, subsequent randomized control trials, both published and presented, have casts doubts on the actual benefits of intensive glycemic control in the ICU. These findings, along with the widely recognized difficulties in attaining intensive glucose control in ICU patients without additional dedicated resources, and the realization of increasing frequencies in hypoglycemia, have led to a need to re-evaluate this practice. This short presentation will highlight and interpret the latest published and

unpublished clinical trial data, both for and against intensive glycemic control in the ICU, as well as discuss remaining questions for future research.

Goals and Objectives

1. To provide pharmacists with an update of the latest clinical trial data on the issue of intensive glycemic control in the ICU.
2. To provide a framework for safe implementation of intensive glycemic control in the ICU to optimize patient safety.

Self-Assessment Questions

1. What is a common feature in the latest "negative" clinical trials on the issue of intensive glycemic control in the ICU?
2. What are some differences in the glucose management strategies employed in the first and subsequent Leuven studies?
3. What are 3 factors that will increase the likelihood of success in implementation of intensive glycemic control in the ICU?

Lymphoma 101: A Primer for Non-Oncology Pharmacists

Celina Dara, BScPhm, ACPR, PharmD, St Michael's Hospital, Toronto, ON

Lymphomas are a heterogeneous group of malignant disorders of the lymphoid cells and are morphologically subdivided into Non-Hodgkins lymphoma (NHL) and Hodgkin's lymphomas (HL). Though both diseases originate from lymphocytes, the incidence in Canada, risk factors, presentation, prognosis, and treatments are different. The goal of this session is to provide pharmacists with an understanding of the etiology of lymphoma, disease complications, current treatment strategies, and symptom management issues.

NHL cases are more common than HL, with the incidence increasing over the past several decades. NHL is classified into either B or T lymphocyte NHL, with many sub-types differentiated on the basis of cell type. Upon diagnosis and staging, most patients will receive chemotherapy, targeted immunotherapy, and/or radiotherapy. Surgery alone may rarely be curative. At presentation, HL has a bimodal age distribution with a peak in young adults younger than 30 years and a second peak after 50 years of age. The diagnosis is characterized by Reed-Sternberg cells and, upon staging, most patients are treated successfully with chemotherapy and radiation.

From ABVD to CHOP-R, pharmacists can help patients in managing the common toxicities of the treatment regimens. Pharmacists can identify, prevent or treat acute side effects such as nausea/vomiting and myelosuppression, to delayed toxicities such as peripheral neuropathy. Recognizing specific toxicities, and developing a therapeutic plan with the patient to manage the side-effects, will help the patient maintain a good quality of life.

Goals and Objectives

1. To understand the differences between NHL and HL as it pertains to disease presentation, prognosis, and treatment strategies.
2. To recognize common chemotherapy regimens used in the treatment of lymphomas, and develop a care plan to manage the common regimen related side-effects.

Self-Assessment Questions

1. What is the difference between NHL and HL?
2. Which side-effects should I be monitoring for in a lymphoma patient who presents 7 days after treatment?
3. What potential long-term treatment-related toxicities exist in the management of NHL or HL?

Pharmacy Technicians: Recognition as a Health Professional and the Regulatory Process in Canada

Alan Samuelson, BScPharm, College of Pharmacists of BC, Vancouver BC

The role of pharmacy regulatory bodies in Canada is to safeguard public health by ensuring that only those appropriately qualified and trained are authorized to provide pharmacy care. All individuals practicing or assisting in the practice of pharmacy should be accountable to the public through a provincial regulatory pharmacy body.

The demand for pharmacy services in Canada will increase in the coming decades because of the aging population and a shortage of pharmacists. The majority of Canadians over 65 years of age have at least one chronic disease, many of which are managed by prescription drug therapy or by drugs restricted to sale from pharmacies. Pharmacists must relinquish routine product-handling functions to pharmacy technicians in order to improve patient outcomes by following the pharmaceutical model of care and become engaged in medication management in a patient-centered health care environment. Pharmacists will be accountable for the individual patient outcomes of the medication therapy they manage. Pharmacy technicians will be accountable for the mechanics of dispensing.

The delegation of technical tasks to pharmacy technicians requires the regulation of pharmacy technicians. They will require uniform education, training and certification to effectively accomplish their work. They will be qualified and licensed to perform many of the technical skills of pharmacy practice.

Some provincial regulatory bodies are in the process of having pharmacy technicians recognized as a health professional. By registering, regulating and establishing the pharmacy technician roles and responsibilities in provincial pharmacy legislation will make them more accountable in the dispensing process. This will optimize the role of the pharmacist to provide quality primary health care services and increased therapeutic interventions.

Goal and Objectives

1. The goal of this session is to provide an update on the regulation of pharmacy technicians in Canada and the impact on the profession of pharmacy.

Self-Assessment Questions

1. Should pharmacy technicians take on technical responsibilities in the dispensing process?
2. Should pharmacy technicians in hospitals be assigned clinical activities within pharmacy?
3. Should pharmacy technicians be self-regulating or regulated under the regulatory body for pharmacists?

New Anti-Infectives on the Canadian Horizon

Joseph L. Kuti, PharmD, Hartford Hospital, CT

Increasing resistance among community and nosocomial acquired bacteria to currently utilized anti-infectives has resulted in a generally unmet need to add new agents to our current armamentarium. Only 4 new antibiotics have received approval in the United States since 2003: daptomycin, gemifloxacin, telithromycin, and tigecycline. Some of these new anti-infectives may soon be available to clinicians in Canada. Additionally, several antibiotics are currently in development that will further address resistant infections. The goal of this session is to provide pharmacists an overview of these newer anti-infectives with a focus on discerning the role of some of these agents in the healthcares system.

Tigecycline, a novel Glycylcycline, has broad-spectrum in vitro activity against Gram-positive bacteria including methicillin-resistant Staphylococcus aureus (MRSA) and vancomycin-resistant enterococci (VRE), Gram-negatives including Escherichia coli (and extended-spectrum b-lactamase producing strains), Klebsiella species and Acinetobacter species, as well as anaerobes and intracellular bacteria; the antibiotic has poor activity against Pseudomonas aeruginosa. Daptomycin is a novel lipopeptide antibiotic with potent Gram-positive activity. Recent data with high dose daptomycin (6mg/kg) demonstrated comparable efficacy to semi-synthetic penicillins and vancomycin in complicated bacteremia and endocarditis caused by S. aureus. Doripenem and RO4908463 are in Phase III and II clinical studies, respectively. Both will be broad-spectrum anti-pseudomonal carbapenems, with RO4908463 also demonstrating in vitro activity against MRSA. Ceftibiprole, an anti-MRSA cephalosporin, is in development for cSSTI and pneumonia and appears to have similar activity to cefepime with the addition of lower MICs against MRSA. Lastly, semi-synthetic lipoglycopeptides, dalbavancin and telavancin, are completing Phase III development for cSSTI; telavancin is also being studied for pneumonia. Both agents display potent Gram-positive activity including MRSA and most strains of VRE. Dalbavancin, in particular, has an extended half-life that will allow for once weekly dosing. Although numerous new antibiotics are in development, it is clear that there is still a gap in the antibiotic pipeline for agents with activity against multidrug resistant Gram-negatives, specifically P. aeruginosa.

Goals and Objectives

1. To provide pharmacists an overview of new anti-infectives recently marketed or currently in development.
2. Discern the potential role of these new anti-infectives in the healthcares system.

Self-Assessment Questions

1. What are current resistance rates among common Gram-positive and Gram-negative bacteria in your local area and what therapeutic options do you have for these pathogens?
2. What will be the roles of newer antibiotics such as tigecycline and daptomycin in your local hospital?

The Art and Science of Peerless Peer Review

Mary H.H. Ensom, BS(Pharm), PharmD, FASHP, FCCP, FCSHP, University of British Columbia and Children's & Women's Health Centre of British Columbia, Vancouver, BC

The peer review process is the cornerstone of all high-quality, well-respected publications. An effective reviewer is the most essential element of the peer review process. What are the attributes of a "peerless peer reviewer"?

During this workshop, we will discuss these attributes as they relate to the "art" (e.g., promptness, organization, tactfulness, constructiveness, objectivity, etc.) and "science" (e.g., specificity, precision, completeness, content expertise, and [if applicable] clinical experience and perspective, knowledge of scientific methodology and statistics, etc.) We will also walk through reviewers' checklists and discuss the appropriate questions to ask when reviewing articles. Attendees will have the opportunity to apply these "art" and "science" attributes and reviewers' checklist skills to performing hands-on critiquing of sample peer reviews.

Goals and Objectives

1. Describe the peer review process for the Canadian Journal of Hospital Pharmacy.
2. List components of journal reviewers' checklists/ appraisal forms.
3. List and describe the "art" components of peer review.
4. List and describe the "science" components of peer review.
5. Critique and provide suggestions and revisions for sample peer reviews.

Self-Assessment Questions

1. Which of the following is false:
   a. Peerless peer reviewers should support their comments with appropriate references if possible.
   b. Peerless peer reviewers should provide line-by-line comments on grammar and syntax.
   c. Peerless peer reviewers should inform the journal immediately if they cannot review the article by the designated deadline.
   d. Peerless peer reviewers should provide acrimonious critique if the article contains fatal flaws.
   e. Peerless peer reviewers should point out areas for which they are not qualified to critique.
2. A peerless peer reviewer should ask the following question:
   a. Are the objectives clearly stated, and are they addressed in the balance of the paper?
   b. Do the results make sense?
   c. Are the results reasonably interpreted?
   d. Does the discussion put the paper into the appropriate perspective by citing the relevant literature?
   e. All of the above.

Answers: 1 (b); 2 (e)

A Practical Approach to Managing Inflammatory Bowel Disease Patients

Co Q. D. Pham, BSc, BA, BScPharm, PharmD, Montreal General Hospital, Montréal, QC

Inflammatory bowel disease (IBD) is an idiopathic chronic relapsing inflammation of the gastrointestinal tract (GIT), and may include extra-intestinal manifestations in joints, skin, eyes and liver. IBD includes both ulcerative colitis (UC) and crohn's disease (CD). These two entities of IBD differ in clinical signs and symptoms related to their histopathology and severity. The current understanding accepts that CD and UC are distinct entities. The etiology of IBD remains poorly understood, though it is greatly associated with environmental, genetic, infectious and immunological factors.

Pharmacotherapy plays an integral role in the management of IBD. The initiation of treatment in IBD must be based on an accurate diagnosis. The treatment goals include the induction of remission, maintaining remission, restoring and maintaining nutrition, maintaining the patient's quality of life, and the selection of the optimal medical therapy. The general treatment approach to IBD has traditionally focused on the inflammatory process. Agents such as 5-aminosalicylic acid (5-ASA's), corticosteroids, antimicrobials, and immunosuppressive agents are used to treat active disease or to maintain remission. More recently, much interest has focused on the use of TNF-a antagonists in the treatment of IBD.

As our knowledge of IBD improves and IBD therapies become more complex, the role and need for pharmaceutical care is even more important. Pharmacists remain the most accessible health professionals to IBD patients. Pharmacists are in a key position to assess symptomatic changes of disease in community practice, as well as institutional settings. This workshop will review the pharmacotherapy in IBD, as well as delineate some practical approaches to managing IBD patients.

Goals and Objectives

1. Define & differentiate between the IBD disorders.
2. Recognize the signs & symptoms associated with the IBD disorders.
3. Understand the etiologies associated with the IBD disorders.
4. Understand the function of aminosalicylic products, corticosteroids, immunosuppressive agents, antimicrobials, and the new biological agents in IBD.
5. Recognize the utility and application of pharmacotherapy in the IBD disorders.

Acid-Base Disturbances – A pIACIDly BASE-ic Approach to Interpretation, Diagnosis, and Treatment for Clinical Pharmacists

Sean K. Gorman, BSc(Pharm), ACPR, PharmD, Vancouver Coastal Health, Vancouver BC

Acid-base disturbances include metabolic acidosis (positive anion-gap and non-anion gap), metabolic alkalosis, respiratory acidosis, and respiratory alkalosis. These disturbances are commonly encountered in hospitalized patients and may be related to drug-therapy and/or require pharmacologic treatment. To ensure optimal identification, prevention, and resolution of drug-related problems in patients with acid-base disturbances, clinical pharmacists should possess 3 important skills: be able to accurately interpret arterial blood gas results, be able to provide an extensive differential diagnosis of potential drug-related culprits of an acid-base disturbance, and be able to provide patient-specific recommendations for the pharmacologic treatment of acid-base disturbances.

The first component of this workshop will focus on developing a systematic approach to interpreting arterial blood gas results. This approach will enable the pharmacist to determine whether the acid-base disturbance is considered "simple" or "mixed". Common causes of acid-base disturbances, with a focus on drug-related causes will be thoroughly explored. The pharmacotherapy of these disturbances will also be reviewed.

The second component of this workshop will focus on application of the above skill sets and knowledge base to guide the pharmacist's workup of drug-related problems in cases of acid-base disturbances. A variety of patient-cases that encompass the spectrum of acid-base disturbances will be reviewed.

Goals and Objectives

1. To provide pharmacists with a systematic approach to interpretation of simple and mixed acid-base disturbances.
2. To enable pharmacists to identify common drug-related causes of acid-base disturbances.
3. To enable pharmacists to recommend patient-specific pharmacotherapy for acid-base disturbances.

Self-Assessment Questions

1. What are the compensation rules for the four acid-base disturbances, which include metabolic acidosis, metabolic alkalosis, respiratory acidosis, and respiratory alkalosis?
2. What are the most common drug-related causes of positive anion gap and non-anion gap metabolic acidosis, metabolic alkalosis, respiratory acidosis, and respiratory alkalosis?
3. What are the pharmacologic options for treating metabolic acidosis and metabolic alkalosis?

Antimicrobial Drug Use Measurement and National Hospital Benchmarking

Donna Lowe, BScPhm, PharmD, University Health Network, Toronto ON; Heather Lummis, BScPharm, MSc, Capital Health, Halifax, NS; Dominique L. Monnet, PharmD, PhD, Statens Serum Institut, Copenhagen, Denmark

This session will review antimicrobial drug use measurement using the World Health Organization's (WHO) Anatomical Therapeutic Chemical/Defined Daily Dose (ATC/DDD) system. The ATC/DDD system is an international, standardized method of measuring drug use in order to provide trending data within institutions, or for comparisons with other hospitals, regions, or countries. The workshop is designed for pharmacists who manipulate drug utilization data (both beginners and those experienced with the ATC/DDD system) and also relevant for pharmacy managers who need to understand, interpret, and report drug use data. Practical working examples will be used to provide pharmacists with the necessary tools to report their own hospital's antimicrobial drug use data in DDD/100 bed days using Microsoft Excel.

The advantages of manipulating antimicrobial data will be further explored through hospital benchmarking. Benchmarking is the comparison of an individual hospital against the group's aggregrate value. Monitoring antimicrobial use in hospitals is important to determine relationships with bacterial resistance, reveal prescribing practices, observe the effect of formulary policies, and make comparisons with other hospitals or countries. International examples of hospital benchmarking will be reviewed and the steps necessary for implementation in Canada will be discussed. The preliminary work done to establish a Canadian hospital benchmarking network will be described and future directions will be proposed. Together we can make connections to share, learn from each other, and enhance the value of our data!

Goals and Objectives

1. To review the World Health Organization's (WHO) Anatomical Therapeutic Chemical/Defined Daily Dose (ATC/DDD) system for standardizing drug use measurement.
2. To provide hands-on examples of converting drug utilization data into DDD/100 bed days.

3. To describe the rationale for benchmarking hospital antimicrobial data.
4. To discuss international experiences and practical tips for setting up a national benchmarking system.

Self-Assessment Questions

1. What is a defined daily dose (DDD) and how would you calculate the number of DDD/100 bed days for any given antimicrobial agent?
2. What is the purpose of benchmarking antimicrobial drug use?
3. What steps are needed in your institution to move towards standardizing drug use measurement?

Don't Just Talk the Talk: Delivering Effective, Evidence-Based Presentations

Richard S. Slavik, BSc(Pharm), ACPR, PharmD, FCSHP, Pharmacotherapeutic Specialist, Vancouver Coastal Health Authority, VGH Site & Clinical Associate Professor, Faculty of Pharmaceutical Sciences, UBC

Evidence-based medicine is the process of integrating the best evidence, the individual characteristics of the patient, and individual expertise into a decision-making process to optimize drug therapy. As front-line health-care providers and information managers, pharmacists locate, evaluate, and apply literature evidence to solve patient-specific, focused clinical questions. Unfortunately, the mere existence of high-quality research evidence does not guarantee adequate dissemination and appropriate application of evidence into clinical practice. To effect change and realize their potential, pharmacists must effectively communicate and present current, valid information to patients, colleagues, physicians, students, policy-makers, and the public. Providing effective presentations is an essential skill relevant to pharmacy students, clinicians, educators, researchers, and administrators. Although the impact of traditional, didactic, stand-alone continuing education has been debated, providing interactive presentations and integrated, active learning workshops incorporating key adult learning principles has been shown to improve the perceptions, motivation, knowledge, skills, attitudes, and behavior of attendees. Key components of high-quality presentations include researching and analyzing the audience, planning and preparing the session, setting the stage, optimizing the delivery of information, listening and stimulating questions, integrating appropriate visual/presentation aids, and handling of questions. The goal of this workshop is to provide a step by step process to guide pharmacists to deliver effective, evidence-based presentations that can be used regardless of the topic of the presentation. It will incorporate an interactive didactic component, opportunities for group discussion, practical application of key principles and delivery, and the opportunity for peer feedback.

Goals and Objectives

1. To provide pharmacists with a systematic process for developing effective, evidence-based presentations.
2. To provide pharmacists an interactive group setting to discuss how to apply the principles of making an effective, evidence-based presentation.
3. To provide pharmacists with a case scenario to practice delivering an effective, evidence-based presentation, and receive constructive peer feedback.

Self-Assessment Questions

1. List three resources tools to assist in the validity assessment of randomized controlled trials, meta-analyses, and clinical practice guideline information to be included in presentations.
2. What are the common characteristics and factors that serve as motivation for adult learning.
3. List the four critical elements of learning that must be addressed to ensure that participants learn.

Optimizing β-lactam Pharmacodynamics

Joseph L. Kuti, PharmD, Hartford Hospital, CT

As bacterial resistance continues to increase, optimizing the potential for successful clinical outcomes with antimicrobial therapy requires consideration of pharmacodynamic concepts to maximize bacterial eradication and to minimize the potential for further resistance. This session will review the pharmacodynamic properties of b-lactam antibiotics and demonstrate novel dosing strategies for the pharmacist to apply in clinical practice. Examples of the clinical utility of certain dosage regimens will be provided.

b-lactams are concentration-independent killers and benefit greatest by increasing the percent of the dosing interval that concentrations remain above the MIC (T>MIC). The various sub-classes of b-lactams require different levels of T>MIC exposure to exert maximum bactericidal activity. With the use of population pharmacokinetics and simulation techniques, various dosage strategies can be tested to optimize the pharmacodynamics of these antibiotics. This is most often accomplished with the use of prolonged or continuous infusion, which have been applied to cefepime, ceftazidime, imipenem, meropenem, and piperacillin/tazobactam, among others. By optimizing

pharmacodynamic parameters with these methodologies, successful treatment of pathogens may be possible in patient populations for whom standard dosing regimens are not effective.

Goals and Objectives

1. Understand the role of pharmacodynamics in designing antibiotic dosing regimens to combat emerging bacterial resistance.
2. Identify strategies for optimizing the pharmacodynamic profiles of specific b-lactam antibiotics.

Self-Assessment Questions

1. Which pharmacodynamic parameter is best correlated with bactericidal activity for the b-lactam antibiotics?
2. What dosing strategies might be considered to treat bacteria that are less susceptible as defined by the minimum inhibitory concentration?

The ABC's of Hepatitis

Curtis Cooper, MD, FRCPC, The Ottawa Hospital, Ottawa, ON

Many viruses can produce acute and/or chronic hepatitis. The most common causes globally and in Canada include HAV, HBV and HCV. HAV, which is most often spread by fecal-oral contamination of food or surfaces, produces an acute hepatitis without a chronic phase. Treatment is supportive for HAV infection. Immune globulin may be administered as well. HBV is most easily spread by blood and sex. It produces both an acute illness and may result in chronic infection. Both HAV and HBV are vaccine preventable. HCV is most often spread by blood. It usually produces a mild acute infection and in the majority of exposed results in chronic infection. There is no vaccine to prevent HCV infection if exposed. Chronic infection with HBV and HCV produce cirrhosis, liver failure and/or liver cancer in approximately 25% of those infected. There are medications to treat chronic HBV and HCV infection for those deemed to require treatment. Research continues to develop more effective and better tolerated therapy of both of these chronic viral infections.

Goals and Objectives

1. Appreciate the risk factors for infection with HAV, HBV and HCV.
2. Understand the appropriate work-up for chronic HBV and HCV infection.
3. Understand the rational for treatment selection in those with chronic HBV and HCV.

Monday, January 29 • Lundi 29 janvier

Keeping Current with Medication Safety Research: What Do Hospital Pharmacists Need to Know?

Neil J. MacKinnon, PhD, FCSHP, Dalhousie University, Halifax, NS

The goal of this session is to provide pharmacists with a summary of recently published key studies related to medication safety and to discuss the implications for hospital pharmacy practice in Canada.

The increase in the body of evidence demonstrating that there are serious problems with the safety of the medication use system has been staggering. For example, in summer 2006, the latest report from the Institute of Medicine was released, adding further to this evidence. This report estimates that approximately 1.5 million preventable adverse drug events occur each year in the US, resulting in at least $3.5 billion US in costs. More recently, research efforts that have been directed toward the development of medication safety indicators in Canada have been undertaken.

Due to the rapid growth in the medication safety literature, it is becoming increasingly difficult for hospital pharmacists to stay current with the sheer volume of studies. While not all studies published in this area have direct relevance to hospital pharmacy practice in Canada, many do contain recommendations that, if implemented, could dramatically improve the safety of our medication use system. In this presentation, Dr. MacKinnon will highlight several of these studies and emphasis will be placed on the application of the results to hospital pharmacy practice in Canada.

Pharmacists attending this session will be challenged to consider how they can best implement the suggestions from these new studies, both on an individual basis and collectively as Canada's hospital pharmacists.

Goals and Objectives

1. To provide pharmacists with the highlights of recently published sentinel medication safety studies.
2. To enable pharmacists to consider how best to apply the results of these studies to their own practice setting.

Self-Assessment Questions

1. What changes do I need to make in my own pharmacy practice based on the results of these studies?
2. What themes are common in these recently published medication safety studies?
3. How can I best communicate the results of these studies to other hospital pharmacists, physicians, nurses and hospital administrators?

Leadership Pearls

Carolyn Bornstein, BScPhm, ACPR, Southlake Regional Health Centre, Newmarket, ON & President Elect, CSHP; Jean-Francois Bussières, BPharm, MSc, MBA, FCSHP, Chief Department of Pharmacy, Centre hospitalier universitaire Sainte-Justine, Montréal, QC; Thomas Paton, PharmD, Director of Pharmacy, Sunnybrook Health Sciences Centre, Toronto, ON

The presenters of this session will review leadership opportunities within 1. professional associations at the community, provincial and national level, 2. an academic teaching centre and 3. a multisite teaching hospital.

The speakers will share their personal views of leadership including "lessons" learned. What special skills are needed to assume a leadership role and how does an individual acquire such skills? How deliberate do you need to be in your career planning to assure success? Fundamental principles of mentorship, confidence building, succession planning, active delegation, professional volunteerism and academic commitment will be explored. Importantly how do we attract staff into these increasingly challenging and complex roles? Each of us has a role and responsibility for providing opportunities for leadership, identifying individuals with such potential and being available to provide support for those with such an interest.

Goals and Objectives

1. To identify opportunities for professional association involvement at the community, provincial and national level.
2. To identify leadership opportunities within an academic teaching or multisite centre.
3. To reflect on whether or not you have the potential to be a leader.

Self-Assessment Questions

1. How do I become involved in various leadership opportunities?
2. Who do I talk to if I have such an interest?
3. What is my obligation to seek out and assist individuals with leadership potential?

Home Care Pharmacists: Practices and Patient Outcomes from Coast to Coast

Stacey MacAulay, BScPharm, PharmD, South East Regional Health Authority, Moncton, NB; Karen Cameron, BScPhm, ACPR, CGP, Scarborough CCAC, Scarborough, ON; Carla Ambrosini, BScPharm, Fraser Health Authority, Surrey, BC

Practising in the home care setting is a unique area of pharmacy practice. This presentation will highlight three different models of practice across Canada and outline key results of research initiatives.

The South-East Regional Health Authority initiated a pilot project in 2004 in which clinical pharmacy services were provided to high-risk patients recently discharged from hospital. This model focussed on providing home visits over a three week period following hospitalization.

The Scarborough Community Care Access Centre initiated a pharmacist home visit pilot project in 2004 which lead to the development of an expanded project in 2005-06. The majority of referrals to the program were from the CCAC in-home coordinators (70%) and CCAC hospital coordinators (20%).

The Fraser Health Authority Medication Management Program started in April 2005 and is modeled on the High Risk Intervention Program (White Rock BC 2000). In this community-based program, pharmacists made home visits to patients discharged from hospital within the previous 7 days, who were over 65 years and taking ≥ 6 medications.

Outcomes from these three initiatives will be discussed during the presentation.

Goals and Objectives

1. To inform pharmacists about three of the current pharmacy home care initiatives in Canada.
2. To describe the impact of pharmacist intervention in the home care setting on patient and health care system outcomes.

Self-Assessment Questions

1. What are some of the various practice models used for pharmacist involvement in home care in Canada?
2. What is the impact of pharmacist involvement in the home care setting on patient and health care system outcomes?

To PharmD or not to PharmD, that is the Question: A National Update

Nancy M. Waite, PharmD, Associate Professor, University of Toronto, Toronto, ON

A move to the PharmD degree as the sole entry-to-practice degree has been discussed by Canada's pharmacy professionals for more than a decade. As the health care landscape continues to change to include primary care reform, interdisciplinary practice, prescriptive rights, therapeutic substitution and changing roles of health care providers including technicians, the roles and expectations of pharmacists are being redefined. Faculties of Pharmacy continue to revise their curricula to ensure that graduates can meet these pharmacy-related health care needs. Many faculties already have credit-heavy Bachelor programs and have difficulty accommodating the increased experiential offerings, opportunities for interprofessional education, enhanced skill development and expanded knowledge base in areas such as pharmacogenomics, biotechnology, preventive medicine, health promotion and complementary medicine. While some schools have modified their curricula within the Bachelor in Pharmacy configuration, other schools, upon recognizing that their revised program would be comparable to the entry-level PharmD (ELPD) in the US, have made the decision to switch to the ELPD. Others are considering offering the ELPD concurrently with the Bachelor in Pharmacy.

This session will provide an overview of:

- the health care changes that are shaping our academic programs,
- the areas within the pharmacy curricula that need to have sufficient time and resources devoted to them to meet future graduates' needs,
- important issues, within and outside hospital pharmacy, that need to be considered if these initiatives are going to be successful and
- an update on the entry-level PharmD activities of several Canadian Faculties of Pharmacy.

Goals and Objectives

1. To provide pharmacists with an update on entry-level PharmD initiatives across the nation.
2. To identify the curricular changes that need to occur if pharmacy programs are going to meet the health care needs of the future.
3. To provide reassurance that the issues and concerns of practicing pharmacists regarding the move to the entry-level PharmD are being addressed as these new programs are being developed.

Self-Assessment Questions

1. What stage in the process of moving towards an entry-level PharmD is the province of Quebec, Alberta and Ontario?
2. What changes need to occur within the pharmacy curricula to ensure that pharmacy graduates in the future can meet the changing health care needs?
3. What concerns do hospital pharmacists have about the entry-level PharmD degree and how are these being addressed by Faculties of Pharmacy?

Who's Your Daddy? A Conflict of Interest Discussion

Robin J. Ensom, PharmD, FCSHP, Vancouver Coastal Health and Providence Health Care, Vancouver, BC

The pharmaceutical industry is an important partner in the delivery of cost-effective health care. In many ways, a pharmacist's interests are much aligned with those of pharmaceutical representatives. Similarly, health care organizations interests can be aligned with the pharmaceutical industry. However, our interests are different in some very important ways.

Conflict of interest most often arises when our personal interests are used to create a situation in which we are susceptible to the marketing strategies of the pharmaceutical industry. In that way, it is our humanity which deceives us into complacency and is our undoing.

This highly interactive workshop will give participants an opportunity to examine the interests of hospital pharmacists as:

- humans;
- health care professionals; and
- employees of health care organizations.

pharmaceutical representatives as:

- humans;
- pharmaceutical representatives; and
- employees of pharmaceutical companies;

Based on that foundational understanding, participants will have the opportunity to:

- Explore marketing strategies of the pharmaceutical industry;
- Identify common situations in which hospital pharmacists and pharmaceutical representatives interact and identify how real and perceived conflict of interests may arise; and
- Consider the costs, benefits and alternatives to traditional interactions.

Both hospital pharmacists and pharmaceutical representatives are invited to come to the workshop with your opinions, experiences and dilemmas.

Goals and Objectives

1. To provide hospital pharmacists with an opportunity to gain a better understanding of their interests and how they may conflict.
2. To equip hospital pharmacists with tools to identify conflicts of interest and strategies to assist them to avoid or manage that conflict.

Self-Assessment Questions

1. What are my interests as a human?
2. Given a real or hypothetical interaction with the pharmaceutical industry, what human interests are being harnessed as a part of a marketing strategy?
3. What are my alternatives to minimize my susceptibility to strategies that may compromise my professional ethics and duty as an employee?

Toxicology 101

Debra A. Kent, PharmD, DABAT, BC Drug and Poison Information Centre, Vancouver, BC

The goal of this session is to provide pharmacists with an overview of the current approach to managing the poisoned patient using cases of common, acute poisonings.

Overall incidence of poisoning is highest in young children but morbidity and mortality rates are higher in adolescents and adults. Substances most commonly associated with fatality are analgesics, cardiovascular drugs, sedatives, antidepressants, antipsychotics, stimulants and street drugs, and toxic alcohols (including methanol and ethylene glycol).

There is a stepwise approach to managing the poisoned patient. Beginning with stabilization including ABC's and altered mental status, there may be some basic differences to consider in a patient who presents with symptoms that are toxin-induced. Once the patient is stabilized the diagnosis needs to be made or confirmed; this will include physical exam, interpreting essential laboratory tests, and identifying toxidromes. The next step is decontamination: current recommendations for gastrointestinal decontamination have become more patient and toxin specific; gastric lavage is reserved for recent, massive, life-threatening ingestions; activated charcoal is not routinely used for cases which present several hours post-ingestion. Antidote use must be considered: new antidotes (fomepizole), new uses for old antidotes (octreotide, hyperinsulinemia), or new dosage regimens (prolonged administration of N-acetylcysteine for late-presenting acetaminophen overdoses). In a few poisoning situations, enhanced elimination such as hemodialysis will be considered. The mainstay of care however, is supportive, and appropriate monitoring for an adequate observation period is essential.

Goals and Objectives

1. To provide pharmacists with an overview of the current approach to managing the poisoned patient.
2. To enable pharmacists to answer questions and make recommendations on the appropriate use of antidotes.
3. To provide pharmacists with specific information on poisons most likely to result in hospitalizations or prolonged stay.

Self-Assessment Questions

1. What is the rationale and role for hyperinsulinemia/euglycemia therapy in the treatment of calcium channel blocker overdose?
2. What is the toxicity associated with venlafaxine overdose, and how long may these patients be at risk?

Pharmacologic Strategies in the Management of Traumatic Brain Injury

Sharon Yamashita, PharmD, FCSHP, Sunnybrook Health Sciences Centre, Toronto, ON

Traumatic Brain Injury is a devastating injury, generally occurring in young and previously healthy adults. Previous pharmacologic strategies (eg corticosteroids, NMDA antagonists, calcium channel blockers) aimed at antagonizing the neurotoxic cascades activated following head trauma have been disappointing. The current pharmacologic approach to these patients remains primarily supportive and includes maintaining cerebral perfusion pressure and prevention of secondary insults to the brain (eg hypoxia, hyperthermia, hyperglycemia, seizures). In addition, there has been a renewed interest in the use of osmotic therapy, with recent studies investigating the use of hypertonic saline in traumatic brain injury.

Goals and Objectives

To provide pharmacists with an understanding of the pharmacologic strategies in the management of traumatic brain injury, including management of raised intracranial pressure, prevention of secondary insults to the brain, and general supportive care.

Self-Assessment Questions

1. Which of the following strategies has been associated with improved outcomes when used following traumatic brain injury:
   a. high dose corticosteroids, or
   b. hypothermia.

Tuesday, January 30 • Mardi 30 janvier

Update on Dyslipidemia: Are Pleotorpic Effects of Statins Relevant?

William Semchuk, MSc, PharmD, FCSHP, Regina Qu'Appelle Health Region, Regina, SK

The goal of this session is to provide pharmacists with an understanding of the new Canadian Lipid Guidelines, supporting data and to discuss the importance of the pleiotropic effects of statins.

In October, 2006, new Canadian Dyslipidemia Guidelines were published. These guidelines differ from the previous guidelines in that the goal for high risk patients (those with a 10 year risk of events is ≥ 20%) is a LDL-C < 2.0 mmol/L. The guidelines also indicate that if pharmacologic treatment is to be initiated for those at low and moderate risk, a 40% reduction in LDL-C should be achieved. Over the last several years a number of significant trials have demonstrated the benefit of aggressive reduction of LDL-C to below 2.0 mmol/L in a broad array of populations.

These aggressive goals will result in a large number of patients not being adequately treated, and utilization of a number of different strategies including combination pharmacologic therapy. To date, very little hard outcome data is available to endorse combination therapy with the rationale being that obtainment of the surrogate endpoint of cholesterol lowering being the main goal.

Whether cholesterol lowering itself is the principle determinant in the reduction of vascular events or whether statins possess unique properties (pleitropic effects) in addition to their cholesterol lowering effects which result in the outcomes seen in clinical trials remains untested.

Goals and Objectives

1. To provide pharmacists with an understanding of the new Canadian Dyslipidemia Guidelines and the supporting data.
2. To provide pharmacists with information pertaining to the importance of the pleotropic effects of statins.

Self-Assessment Questions

1. What are the primary and secondary cholesterol goals for a patient at high risk of vascular events?
2. Do statins have unique properties indicating their superiority over other means of lowering cholesterol?

Medication Reconciliation for Safer Health Care: Where Are We Now?

Marg Colquhoun, BScPharm, FCSHP, Institute for Safe Medication Practices Canada, Toronto, ON

The CCHSA Required Organizational Practices and Safer Healthcare Now! Campaign coincided to create incredible interest and hard work to develop and implement medication reconciliation processes and change medication communication systems in Canada.

The literature describing the magnitude of the problem of adverse drug events (ADE's) is not new, and is growing rapidly. Medication reconciliation is intended to reduce the frequency of ADE's. It is proving to be a straightforward concept which is difficult to implement. Medication reconciliation requires us to implement system-wide changes, work as teams and communicate clearly. The intervention has enormous potential to reduce the burden of morbidity.

As part of the Safer Healthcare Now campaign there are approximately 200 Canadian teams focussing on medication reconciliation. This presentation will discuss the results of the work of these teams: successes, barriers, results, measurements and 16 months of learning. It will describe the process and measurement for transfer and discharge medication reconciliation. The CCHSA ROP and evidence of compliance for 2007 will also be reviewed.

Goals and Objectives

1. To provide an overview of lessons learned during 16 months of Canadian medication reconciliation teams and enable pharmacists to build upon the work of teams across the country.
2. To provide an update regarding the SHN revised kit (transfer and discharge) and CCHSA evidence of compliance of ROP (medication reconciliation).

Self-Assessment Questions

1. What changes will improve our patient discharge process from acute care?
2. What changes will our team need to make in order to ensure that we meet the needs of the CCHSA ROP and to continue with the Safer Healthcare Now Campaign?

Ensuring Access to Antidotes: The Capital Health Antidote Kit Project

Theresa Hurley, BSc(Pharm), ACRP, Capital Health, Halifax, NS

It has been well documented that antidotes stocked in Emergency Departments (ED) are often inadequate in terms of antidote selection and quantity of antidotes. A survey of antidotes stocked in 7 Capital Health (CH) ED and the IWK Health Centre (IWK) ED identified a deficiency within the district.

A collaborative team, consisting of representatives from CH, IWK and IWK Regional Poison Centre, was created to address this issue. Funding for the project was secured and the following components, integral to the project's success, were developed: district standards for required antidotes and quantities, a convenient high profile format (kit) for the storage of antidotes in ED, a simple and efficient procedure for antidote kit replenishment, a district-wide policy and procedure for accessing additional antidotes in non-urgent and urgent situations and an educational resource (Manual) containing information on antidote dosage and administration.

The Antidote Kits were distributed to ED over a 9-month period. As of December 2005, all CH and IWK ED have standardized antidotes in standardized quantities. This initiative provides patients access to lifesaving antidotes and ensures that the opportunity for treatment of poisonings/overdoses is consistent at all sites in CH and IWK.

To date, 15 patients have benefited from this quality improvement initiative. This project has contributed significantly to patient care at CH and IWK by providing the tools to enable healthcare professionals to save lives that may have previously been jeopardized.

Goals and Objectives

1. To highlight the issue of antidote deficiencies in hospitals in Canada.
2. To outline system process changes that would allow the correction of these deficiencies.

Self-Assessment Questions

1. Does my ED stock appropriate antidotes and adequate amounts of antidotes?
2. What process changes are required to appropriately stock my ED with antidotes?
3. Once the ED is stocked appropriately, is there adequate information available to ensure appropriate and safe administration of antidotes in my facility?

Medication Safety: Practical Tips from a Pediatric Point of View

Don Hamilton, BSc(Pharm), Roxane Carr, BSc(Pharm), PharmD, Children's & Women's Health Centre of BC, Vancouver, BC

The goal of this session is to discuss issues in medication safety and provide pharmacists with some strategies to assist in identifying and resolving medication safety issues.

Medication errors continue to be a problem in both adult and pediatric settings. Medication errors may involve errors in prescribing, compounding, and/or administration. Many initiatives, such as safety rounds, clinical pharmacy programs, computerized prescriber order entry and dose checking, standard concentrations, and smart pumps, have been implemented in efforts to identify actual and potential errors and to implement changes in systems to prevent errors from reaching patients. Because of differences in pharmacotherapy between adults and children including dosing and manipulations of commercially available medications to achieve doses suitable for children as well as volume issues and variability in dosing because of weight based dosing, pediatrics pose unique sets of risks. Further challenges exist in settings where both pediatric and adult patients are served by the same institutional pharmacy department. Systems developed to minimize errors in adult patients may not be suitable for identifying risks and minimizing errors in pediatric settings.

This will be an interactive session to discuss medication safety issues with a focus on pediatric institution experience. General update on safety initiatives and a description of what is going on at institutions across the country as well as current safety issues and strategies to implement changes will be discussed.

Goals and Objectives

1. To discuss issues in medication safety and provide pharmacists with some strategies to assist in identifying and resolving medication safety issues.
2. To provide pharmacists with an opportunity to share experiences and information about medication safety issues at their institutions.
3. To enable pharmacists to consider strategies to prevent and/or minimize medication safety issues once they have been identified.

Self-Assesment Questions

1. What are the 3 most common medication safety issues in Canada?

2. What are strategies to identify medication safety issues?
3. What are methods to implement programs or policies to improve medication safety?

Update on the Use of Combination Therapies (Inhaled Corticosteroids – Long-Acting Beta$_2$-Agonists) in Asthma and COPD

Marie-France Beauchesne, BSc(Pharm), MSc(Pharm), PharmD, Hôpital du Sacré-Cœur de Montréal, Montréal, QC

The goal of this session is to provide pharmacists with an understanding of the place in therapy of a combination of an inhaled corticosteroid (ICS) with a long-acting beta-agonist (LABA), in asthma and COPD.

The addition of a LABA is now recommended in adults when asthma is not adequately controlled by low doses of ICSs. Furthermore, the use of the product combining budesonide and formoterol has a maintenance and reliever therapy is another treatment option. The evidence behind these strategies will be discussed.

Five large randomized controlled trials compared the use of a combination of LABA and ICS with the individual components in COPD. Whether combination treatment (ICS-LABA) can reduce mortality in COPD will also be summarized.

Goals and Objectives

1. To provide pharmacists with an understanding of the place in therapy of the combination of ICS-LABA in asthma and COPD.
2. To enable pharmacists to discuss the evidence supporting the use of combination therapies (ICS-LABA) in asthma and COPD.

Self-Assessment Questions

1. How should we counsel a patient with asthma on the use of budesonide/formoterol has maintenance and a reliever therapy?
2. What are the benefits of using the combination of an ICS with a LABA in patients with COPD?

Telepharmacy: Using Technology to Extend the Reach of Pharmacy Services

Kevin McDonald, BScPHM, The North West Company, Ottawa, ON

Telepharmacy is the use of electronic information and communications technologies to provide and support pharmaceutical care when distance separates the participants. There is potential to use telepharmacy support to expand the role of the pharmacist to communities and hospitals that have a shortage of pharmacist support.

Since April 2004 a telepharmacy model of care has been used to provide pharmacist support to a 40 bed hospital in Northern Ontario. In this model, inpatient orders are scanned and saved as .PDF files on the hospital network. The pharmacist accesses the network, reviews the orders, makes necessary interventions, and enters them into the pharmacy management software. The labels print in the pharmacy department where the orders are filled using a tech-check-tech system. Patient counseling and medication histories occur by phone or e-mail. Teleconference calls allow pharmacist participation in patient care rounds and meetings, including active participation in the Pharmacy and Therapeutics Committee. The intention is to implement a unit dose dispensing system utilizing Automated Medication Dispensing Units.

There are examples of other telepharmacy programs, both in community and hospital practice. However, there is considerable room to improve communication between programs to ensure excellence in care is achieved. While telepharmacy is in its infancy, it is growing. With a trend towards hospital's outsourcing many programs and a greater acceptance of specialists working remotely, now is the ideal time to further expand and find a role for telepharmacy.

Goals and Objectives

1. To inform pharmacists and administrators about what constitutes telepharmacy programs today and what new technologies it may soon include.
2. To stimulate thought amongst pharmacists to consider which of their job responsibilities may be possible to complete by telepharmacy or passed to a technician to utilize resources to the fullest.

Self-Assessment Questions

1. Could a telepharmacy system be used in place on an on-site pharmacist?
2. Could better utilization of telepharmacy services improve patient care in Canada?

Breaking New Ground: The Role of the Clinical Assistant

Dr. Michael Namaka, BScPharm, MScPharm, PhD, MS-CA, Faculty of Pharmacy, University of Manitoba, Winnipeg, MB

Over the past century, the profession of pharmacy has evolved from the role of a chemist to that of current

pharmacy practitioners. The central focus of today's practitioners is the patient. The drug is merely a secondary vehicle used in the delivery of the desired patient outcomes. The recent approval of the professional designation of a "clinical assistant" by the College of Physicians and Surgeons in the province of Manitoba resonates well with the evolutionary changes of the profession. At present, Dr Namaka is the first recognized pharmacist to receive this official designation. In this advanced role, the clinical assistant is dually licensed with the College of Physicians and Surgeons and the Manitoba Pharmaceutical Association, thereby appearing on the registry of both colleges. The development of a detailed job description outlining the specific duties and responsibilities associated with this advanced practice was instrumental in securing liability coverage that allowed the clinical assistant to practice in a capacity that was not yet fully established under the Manitoba Pharmacy Act. This new designation of a clinical assistant is in keeping with the future vision for pharmacy projected in the Romanow Report and represents a monumental milestone in the continued advancement of the professional practice of pharmacy.

Goals and Objectives

- To demonstrate the evolution of pharmacy practice.
- To address the new designation of a "Clinical Assistant".
- To discuss the roles and responsibilities of a Clinical Assistant in an inter-professional team.
- To discuss the potential barriers associated with this advanced practice.
- To discuss the potential benefits of this advanced practice.
- To identify specific targeted areas suitable for this advanced level of practice.

Self-Assessment Questions

1. Do all patients require an inter-professional team approach to manage their care? Please Justify!
2. To what extent should patient assessment be introduced into the current curriculum and the current level of pharmacy practice?

Applying Evidence-Based Medicine in Your Practice: Taking a Critical Look at Study Results

Linda Lévesque, BScPhm, MSc, PhD, Queen's University, Kingston, ON

The overall goal of this workshop is to provide pharmacists with an understanding of the different measures used to quantify the risks and benefits of treatments and to discuss important differences that exist between these various measures.

The results of clinical trials are often presented in such a way as to amplify the magnitude of the benefits and minimize the perception of risks. Given this, it is important that pharmacists adopt a systematic and critical approach to reviewing the results of published trials in order to make informed recommendations. However, the critical appraisal process necessitates a good understanding of the various measures used to quantify the effects of a treatment, how each measure is calculated, what it represents, and how the choice of a specific measure can influence treatment decisions.

Using the results from two published trials, this session will compare and contrast the advantages and limitations of the relative risk (RR), the relative risk reduction (RRR), the absolute risk difference (ARD) or absolute risk reduction (ARR), the number needed to treat (NNT), the number needed to harm (NNH), the risk-benefit ratio, and the proportion of event-free subjects. In addition, the importance of an individual's baseline risk in determining the overall risk-benefit of a treatment will be highlighted. A framework for the critical evaluation of study results will be presented and participants will have the opportunity to apply this framework during an exercise.

Goals and Objectives

1. To provide pharmacists with an understanding of the common measures used for quantifying the risks and benefits of treatments and the value of considering both relative and absolute measures.
2. To sensitize pharmacists to the importance and impact of perception bias on decision-making and the potential for manipulation that it creates.
3. To provide pharmacists with a framework for the critical evaluation of study results.

Self-Assessment Questions

1. Can the presentation of a study result influence decision making?
2. What is the impact of an individual's baseline risk on the clinical impact of a treatment?

3. What is the best measure for presenting the results of a randomized trial?

The Teen Challenge: Practical and Creative Strategies for Improving Medication Adherence

Natalie Dayneka, BScPhm, PharmD, FCSHP, Children's Hospital of Eastern Ontario, Ottawa, ON

The goal of this session is to explore strategies to augment adolescent medication adherence.

Medication adherence is an important issue for patients of all ages. For example, poor adherence rates of 37 to 70% have been reported in HIV-infected adult populations. During the stresses of adolescence, the problem of adhering to chronic medication regimens becomes magnified as adolescences approach the importance of adherence with confusion and skepticism. The consequences of nonadherence may elude the adolescent such that patients who survived their pediatric years due to timely medical advancements are now experiencing health problems. Disease-specific interventions are needed; however, there is commonality amongst adolescences with chronic illnesses such that examination of adherence as a broad topic will promote exploring practical and creative strategies for pharmacists to affect adherence.

Goals and Objectives

1. To explore the barriers raised that impede adolescent adherence to life-sustaining chronic medications.
2. To share possible strategies which may augment adolescent medication adherence.
3. To debate the advantages and disadvantages of adherence tools employed to affect medication adherence in the adolescent population.

Self-Assessment Questions

1. What is the usual age range when the responsibility for taking medication is transferred to the pediatric patient?
2. List four major barriers to adherence for the adolescent patient who is required to take medications for a chronic illness. Suggest a potential solution for each barrier.

Teaching Skills for Pharmacists

Lisa M. Zhu, BScPhm, ACPR; Artemis Diamantouros, BScPhm, MEd; & Brian Hardy, PharmD, FCSHP, FCCP Sunnybrook Health Sciences Centre, Toronto, ON

This interactive workshop will address skills identified as critical for effective transfer of knowledge from educator to student. Discussions will cover select topics including: Adult Learning Theory, Setting Goals and Objectives, Questioning Techniques, Providing Feedback and Assessment and Microskills of Teaching.

Clinical teachers, for the most part, work with adults who are independent and self-directed learners. Recognizing principles of adult learning theory will enable you to create instruction that is relevant and meaningful for the learner.

One way to enhance learning is by setting goals and objectives. These provide focus and direction for both the teacher and the learner. Learning objectives incorporate the learner's needs, the teacher's expectations and establish a framework for subsequent feedback and assessment.

Questioning also enhances education by: engaging learners, identifying learners' knowledge levels, encouraging self-reflection and promoting higher level thinking. Forming and asking questions over a range of cognitive domains and levels of complexity allows teachers to see how learners apply their knowledge to clinical decision-making. Of equal importance is effectively responding to students' answers to continue building on the educational opportunity.

Assessing learners and providing feedback is critical to the educational process. Although the concept of providing timely constructive formative and summative feedback is understood by educators, most acknowledge that for various reasons, its application is often less than desired. This workshop will illustrate the IMPROVE approach to assist educators in this process.

Lastly, an educational model known as the "one-minute preceptor" will be introduced to help clinical teachers efficiently apply the above techniques. The "microskills" provide an effective approach for preceptor-student interactions common in clinical teaching.

Goals and Objectives

On completion of the workshop, participants will be able to:

1. Apply the principles of adult learning theory to enhance the students' learning experience.
2. Set goals and measurable objectives for the learner.
3. Formulate questions that are targeted at different cognitive domains, stimulate critical thinking and apply different strategies in response to students' answers.
4. Utilize effective feedback strategies using the IMPROVE technique.
5. Apply the "microskills" of teaching approach (i.e. the one-minute preceptor technique) to efficiently assess,

instruct and give feedback to students in a clinical practice setting.

Self-Assessment Questions

1. How can you apply the 5 assumptions of adult learning theory to foster learning?
2. Can you develop one new learning objective for yourself using the ABCD approach?
3. What 5 strategies can be used to effectively handle a student's response to your questioning?
4. What are the 5 "microskills" of teaching?

Patient Assessment: The Role of the Patient Interview

Allan Mills, BSc(Pharm), PharmD, Trillium Health Centre, Mississauga, ON

The goal of this session is to provide pharmacists with an overview of the patient assessment process and to focus on the important role that the patient interview plays in assessing the patients for drug related issues.

Assessment is a fundamental function that all health care practitioners build into their clinical practice. Assessment is usually described as including such diverse aspects such as physical examination, performing and/or reviewing investigations or tests and the interview. As pharmacists, our ability to interview patients and caregivers is paramount in identifying drug related issues. It allows patients to exchange ideas, wants, beliefs and concerns and to make a connection with the pharmacist. Empathetic communication has been shown to improve patient outcomes in a variety of disease states including diabetes, hypertension and arthritis.

This session will review the different aspects of patient assessment and the impact of a positive patient encounter will be highlighted. A series of techniques that allow pharmacists to be more effective in gathering information will be reviewed as will the importance of interview structure. An interview framework will be introduced and participants will have a chance to adapt this structure for their own particular practice environment. Patient cases and exercises will be used to highlight techniques and to help participants become more effective in working with patients.

Goals and Objectives

1. To demonstrate a patient interviewing framework that pharmacists can adapt for their own practice.
2. To discuss patient interviewing techniques (verbal and non-verbal) which can be used in a wide variety of clinical encounters.
3. To demonstrate how the problem solving process is incorporated into the patient encounter.

Self-Assessment Questions

1. When I come across a patient who is angry how can I turn the encounter into a positive interaction?
2. What techniques can be used to efficiently gather information and to focus the patient interview?
3. How do I ensure that I have gathered the necessary information from the patient to identify the "real" issue?
4. How come the standard questions I ask don't always get the information I need?

Leading Positive Change: Tips for Effective Change Management

Danny Nashman MBA – President, The Potential Group, Toronto, ON

The goal of this session is to provide participants with insights into how to lead change powerfully in an organizational context.

In today's complex healthcare environment, we are all tasked with managing and implementing change. There continue to be a myriad of initiatives within healthcare systems that require professionals to shift their behaviour and work together differently. As leaders, it is helpful to have an understanding of those factors that support individuals to embrace and adopt change with greater ease and commitment.

The Leading Positive Change workshop will introduce the audience to the principles of Appreciative Inquiry, a relatively new methodology for creating and sustaining change in organizations. In this experiential workshop participants will have a chance to experience the method and develop ideas about how to apply this approach to their work. They will emerge will greater understanding of where they already have skill and competence in leading change and ideas for things they could do differently to enhance their effectiveness.

Goals and Objectives

1. To introduce pharmacists to Appreciative Inquiry as a methodology and tool for leadership.
2. To provide perspectives and tools that will help pharmacists lead more effectively to create and sustain positive change.

Self-Assessment Questions

1. What are your strengths as a leader today? Where do you feel most confident and competent?

2. Imagine you were given 3 wishes to enhance your ability to lead change in your organization, what would you wish for and why?

Clinical Trials That May Affect Practice: A FIELD of DREAMs in a SPARCLing OASIS!

Heather Kertland, PharmD, St. Michael's Hospital, Toronto, ON; Nicole Bidwell, BSP, Regina Qu'Appelle Health Region, Regina, SK; Kori Leblanc, BScPhm, University Health Network, Toronto, ON; Claudia Bucci, PharmD, Sunnybrook Health Sciences Centre, Toronto, ON

The goal of this session is to provide pharmacists with an update on recent major clinical trials in cardiology. An overview of five major clinical trials will be provided including a description of the study rationale, design, and results. In addition, the impact of the trial on everyday clinical practice will be covered.

The clinical trials discussed will include:

1. Fondaparinux in the Treatment of Acute Coronary Syndromes
   - The OASIS 5 and 6 trials examined the efficacy and safety of fondaparinux versus enoxaparin in patients with Non ST-Elevation Acute Coronary Syndromes (NSTACS) and ST-Elevation MI (STEMI).
2. Statins for Secondary Stroke Prevention
   - The SPARCL trial examined the use of atorvastatin 80mg daily for the secondary prevention of stroke.
3. Varenicline for Smoking Cessation
   - Recent trials of varenicline, the new nicotinic acetylcholine receptor partial agonist, examined the efficacy of the agent as an aid in smoking cessation.
4. Fenofibrates and Cardiovascular Events in Diabetes
   - The FIELD trial examined the incidence of cardiovascular events in Type 2 diabetics taking long-term fenofibrate therapy.
5. Rosiglitazone and Diabetes
   - The DREAM trial analyzed the progression to type 2 diabetes with ramipril and rosiglitazone treatment.

Goals and Objectives

1. To provide pharmacists with an understanding of recent major clinical trials in the cardiovascular area.
2. To enable pharmacists to discuss the potential impact of these trials to the care of cardiovascular and stroke patients.
3. To facilitate the translation of this new data to individual pharmacist's practices with the goal of improving patient outcomes.

Self-Assessment Questions

1. If you had a patient in which you wanted to choose a medication that prevented the onset of diabetes, would that be ramipril or rosigllitazone?
2. Which of the following statements is most correct?
   a Atorvastatin decrease the risk of recurrent stroke.
   b Fenofibrate reduces the risk of cardiovascular death.
   c Both a and b.
   d Neither a or b.
3. Fondaparinux is effective in reducing cardiovascular death in patients with either ST or non-ST elevation Acute Coronary Syndrome.

Wednesday, January 31 • Mercredi 31 janvier

Drug-Related Hospital Visits: An Underrecognized Epidemic

Peter J. Zed, BSc, BSc(Pharm), PharmD, FCSHP, Clinical Coordinator, Department of Pharmacy, Queen Elizabeth II Health Sciences Centre; Associate Professor, College of Pharmacy & Department of Emergency Medicine, Dalhousie University, Halifax, NS

In the era of increased attention to overall patient safety, several interventions have been implemented to attempt to reduce medication misadventure in the hospital setting. However, patients continue to experience drug-related problems in settings outside the hospital setting. which are associated with significant morbidity and mortality. Only recently has the magnitude and characterization of drug-related hospitalization been evaluated in Canada but unfortunately very little has been done to try and address this growing problem placing significant burden on our health-care system.

As pharmacists we must identify, treat and prevent drug-related problems. This session will outline the impact of drug-related hospitalization in Canada and

discuss the overall burden on our health-care system. Patient populations at risk and the drug-classes most commonly associated with drug-related hospitalization will also be discussed. The session will include numerous case studies illustrating the issues and discuss how many of these could have been prevented. Finally, strategies and future directions will be outlined to address how drug-related hospitalization can be further prevented.

Goals and Objectives

1. To discuss the overall health care impact of drug-related hospitalization.
2. To discuss factors associated with identifying patients at risk and drug classes commonly associated with drug-related hospitalization.
3. To discuss strategies pharmacists can utilize in their practice to treat and prevent drug-related hospitalization.

Self-Assessment Questions

1. What is the overall impact of drug-related hospitalization in Canada?
2. What patient factors are associated with increased risk for drug-related hospitalization?
3. What drug classes are most commonly associated with drug-related hospitalization?

Storm Clouds on the Horizon: Pharmacists in Primary Health Care

Derek Jorgenson, BSP, PharmD, Saskatoon Health Region, Saskatoon, SK

The goal of this session is to provide a provocative description of the challenges that our profession (and the public) is facing in the primary health care system. The main theme of the discussion will focus on acknowledging that we, as hospital based pharmacists, have a key responsibility and a key role to play in ensuring these challenges are successfully addressed.

A veritable sea of evidence continues to consistently highlight the high rate of preventable adverse drug events and poor chronic disease management practices in the primary health care system. This is a chronic problem that falls squarely within the domain and the scope of practice of pharmacists to address. Unfortunately, there are few signs that our profession is rising to this challenge.

If one were to complete a comprehensive literature search looking for successful models of pharmacy practice in primary health care, the studies would boil down into two key themes: (1) Roles for pharmacists WITHIN traditional drug stores; (2) Roles for pharmacists OUTSIDE of traditional drugs stores. Unfortunately that vast majority of pharmacists in primary health care currently work within just one of these models.

Clearly the role of the pharmacist within the primary health care system needs to change in order to ensure that we can optimally utilize our skills and expertise to positively impact patient outcomes. What is not so clear is determining what role that we, as hospital based pharmacists, need to play to make sure this happens.

Goals and Objectives

1. To describe what needs to change with the role of the pharmacist in the primary health care system to ensure that we are optimally utilizing our skills and expertise to positively impact patient outcomes.
2. To describe what our role should be, as hospital based pharmacists, in making sure these changes happen.

Self-Assessment Questions

1. List the four main models of care that have been shown to successfully utilize the pharmacists' role in primary health care?
2. Describe TWO things that you can do within the next month (as a hospital based pharmacist) to take a baby step towards optimizing the role of the pharmacist in primary health care?

Recent Clinical Trials That May Change Your Practice

Amy Sood, BScPhm, PharmD, University of Toronto, Toronto, ON

The goal of this session is to highlight some studies that have been published in the past year that may impact your practice.

Acute treatment of venous thromboembolism (VTE) typically involves at least 5 days of unfractionated heparin (UFH) or low molecular weight heparin (LMWH) overlapping with a vitamin K antagonist for at least 3 months. Although LMWHs are more expensive, they are more convenient to administer because laboratory monitoring is not necessary. A recent publication in the Journal of the American Medical Association compares the efficacy and safety of fixed-dose (unmonitored) weight-adjusted subcutaneous UFH and LMWH in the treatment of VTE.

Numerous randomized trials studying the antioxidant N-acetylcysteine (NAC) for the prevention of contrast-medium-induced nephropathy have been conducted with conflicting results. A meta-analysis of these studies suggests a "borderline" statistical significance favouring NAC. However, these studies did not use clinically

relevant outcomes. The first study to suggest a benefit in a clinically relevant outcome was recently published in New England Journal of Medicine.

Medication non-adherence has been well documented in the literature and even occurs among patients that are closely monitored in clinical trials. Recently, non-adherence has been linked to increased mortality in patients with myocardial infarction and diabetes mellitus. Authors of a randomized controlled trial published in British Medical Journal conclude that telephone counselling by a pharmacist improves compliance and reduces mortality in patients receiving polypharmacy.

These studies will be described and detail.

Goals and Objectives

1. To review the results of recent clinical trials that may change your practice.
2. To understand the strengths and limitations of these studies and discuss implications to practice.

Self-Assessment Questions

1. Should fixed-dose, unmonitored, weight-adjusted subcutaneous UFH be given to patients for the treatment of acute VTE?
2. Is it reasonable to use higher doses of N-acetylcysteine to prevent contrast-induced nephropathy?
3. What were the details of the pharmacist intervention involving telephone counselling?

Speaking to the Media: Tips on How to Get the Right Message Out; Well at Least Most of the Time

James McCormack, BSc(Pharm), PharmD, Faculty of Pharmaceutical Sciences, University of British Columbia, Vancouver, BC

The media (newspaper, radio, TV and now the internet) is a powerful but also potentially problematic tool for getting messages out to a broad audience. As with all things, the media has an "agenda" and as pharmacists we need to be conscious of how we can best interact with the different types of media to get out the "appropriate" messages. This talk will describe, using specific case examples, the different ways in which you can interact with the media to hopefully increase your chance of getting out your desired message.

In addition, data on how well the media disseminates information about new drugs will be presented. Because the news is often seen as a trusted source of health information for not only the lay public but also health professionals, the information people get from the media on new drugs needs to be balanced and accurate. Suggestions for how to help journalists inject a higher dose of "healthy skepticism" into their reporting will be discussed.

Goals and Objectives

1. To provide pharmacists with an appreciation for how to interact with the different types of the media.
2. To demonstrate to pharmacists how well the media covers information about drugs and the types of information we need to provide to the medias.

Self-Assessment Questions

1. What 4 specific things can you do to increase the chance the media gets your message out correctly?
2. What are the 12 essential items that should be included in stories about "new" drugs?

Women's Health Outcomes in an Ethnic Population: The Asian Women's Health Clinic

Elaine Chong, BSc(Pharm), ACPR, PharmD, BCPS, 2005-2006 CIHR Strategic Training Post-Doctoral Fellow in Primary Healthcare Research, Vancouver, BC

Background: The Asian Women's Health Clinic (AWHC) was established in 1994 to address cultural and linguistic barriers limiting access to preventative health services for Chinese women in Vancouver. The impetus for its creation was a report by Archibald and colleagues, who observed that the incidence of invasive cervical cancer among Chinese women in British Columbia in 1985-1988 was almost 4 times higher than in age-matched Caucasian women.

Purpose: To describe breast and cervical cancer screening, and oral contraceptive and hormone replacement use among females attending the AWHC. To determine whether there is a potential role for pharmacists at the AWHC.

Methodology: All women who visit the AWHC are required to complete a medical or recall history form. The current database contains over 10 years of data.

Results: There have been a total of 7655 patient-encounters at the AWHC (1994-2006). The majority of patients are perimenopausal (52.8% between the ages of 40 and 54). Most women had normal Pap smears (mean ± standard deviation 82.3% ± 4.7%), and normal breast exams (86.2% ± 8.8%). Approximately 18.9% of women reported taking oral contraceptives, and 7.8% reported taking hormone replacement therapy.

Conclusion: The extensive database at the AWHC is unique to the female Chinese population in Greater Vancouver and will shed light on unanswered questions

relating to ethnicity and women's health. There may potentially be a role for hospital pharmacist(s) to become involved in a primary healthcare role.

Goals and Objectives

1. To recognize that ethnicity may influence attainment of health outcomes.
2. To recognize that ethnicity may be a factor in determining healthcare service utilization.
3. To describe how primary healthcare research can potentially result in evidence for a pharmacist's role in a specialized primary healthcare setting.

Self-Assessment Questions

1. In the Asian female population, is ethnicity a factor in determining health outcomes and/or healthcare service utilization?
2. What can I learn from this research that will impact my interactions with Asian female patients in regards to women's health issues?

How much "Value" is there in Clinical Practice Guidelines?

James McCormack, BSc(Pharm), PharmD, Faculty of Pharmaceutical Sciences, University of British Columbia, Vancouver, BC

Clinical practice guidelines (CPGs) are intended to assist clinicians in making decisions about individual patient management. Clinicians often rely on CPGs for therapeutic decision-making, and numerous professional societies and patient advocacy groups actively disseminate CPGs. These CPGs are often portrayed as being evidence-based. Evidence based medicine/health care (EBM/HC) is not just a synopsis of research evidence. EBM/HC has been defined as "the integration of best research evidence with clinical expertise and patient values. Guidelines created to aid in the development of CPGs suggest CPGs "should discuss the role of patient preferences for different courses of health care for those conditions or technologies in which patient values and preferences may be important decision-making factors" and they should "…describe the role of patient preferences when a recommendation involves a substantial element of personal choice or values."

Incorporating patients' preferences is particularly important when making decisions about long-term treatment of asymptomatic (at least often initially) conditions such as diabetes, dyslipidemia, hypertension, and osteoporosis. This is illustrated by the cognitive dissonance that appears to occur between CPGs and patient and clinician preferences. For instance, less than 1/3 of patients with or without a history of heart disease expressed the willingness to take a "safe" drug if the absolute chance of reducing a heart attack over 5 years was £ 5%.

This talk will discuss the issue of patient values in CPGs and review 4 Canadian CPG documents (diabetes, dyslipidemias, hypertension and osteoporosis) and determine the degree to which they mention the importance of patients' values and preferences in therapeutic decision-making. In addition, tools and suggestions for how to incorporate patient values into your daily practice will be discussed.

Goals and Objectives

1. To provide pharmacists with an understanding of how patient values need to be taken into account when decisions about drug therapy are being made.
2. To demonstrate to pharmacists that 4 major Canadian CPGs incorporate little if anything about patient values when they provide recommendations about drug therapy.

Self-Assessment Questions

1. Why is it important to incorporate patient values into decisions about therapy for chronic conditions?
2. List three ways in which individual patient values can be incorporated into your day-to-day recommendations

Neonatal Pain: Baby Steps Forward

Anna Taddio, BScPhm, MSc, PhD, Scientist, The Hospital For Sick Children, Toronto, ON

The goals of this session are to provide pharmacists with an overview of: 1) the incidence of medical procedure pain in the newborn infant, 2) barriers that prevent or discourage optimal pain management and 3) evidence for current therapeutic options.

Procedural pain is commonplace in newborns. All newborn infants routinely undergo painful procedures as part of their medical care in the first days and months of life. If they are sick and require intensive care, they may experience hundreds of invasive procedures. There is accumulating scientific evidence that untreated pain leads to long-term effects on infant development, including conditioning to painful procedures and hyper- or hypoalgesia.

Despite this burden of pain put upon infants, utilization of analgesics for procedural pain is inconsistent in clinical practice. Our knowledge of the clinical pharmacology of available analgesic agents has advanced substantially in the last decade and has been identified as a priority by government agencies including the U.S. Food and Drug Administration (FDA). This presentation will review recent pharmacological evidence for several analgesics in the newborn,

including local anesthetics, opioids and sucrose. The emphasis will be on interventions where evidence is sufficient to promote more widespread use in clinical practice.

Goals and Objectives

1. To provide an overview of the epidemiology of pain in newborn infants and barriers preventing optimal procedural pain management.
2. Review scientific literature for currently available analgesics.

Self-Assessment Questions

1. Should procedural pain be routinely prevented and/or treated in all newborn infants?
2. Can you recommend/advise on the benefits versus risks of analgesics in newborns?

The Integrating Family Medicine and Pharmacy to Advance Primary Care Therapeutics Project: The Impact of IMPACT

Lisa Dolovich, PharmD, McMaster University, Hamilton, ON

The IMPACT project was a large scale demonstration project that placed seven pharmacists into seven family physician group practices. The pharmacists worked in their practice sites for an average of 2.5 days per week conducting comprehensive medication assessments, providing drug information and education, and implementing approaches to optimize drug prescribing and use at the practice level. This presentation will provide a brief overview of the IMPACT project. Over 30 research questions were answered including two randomized controlled trials and extensive qualitative evaluation. Results from the program evaluation related to clinical care processes and outcomes, costs of the program, use of drug information support, strength of pharmacist intervention, and patient satisfaction will be highlighted. The implications of the results for pharmacy practice will be discussed.

Goals and Objectives

1. To provide pharmacists with a description of the IMPACT project intervention.
2. To provide pharmacists with a description of the results generated from the IMPACT program evaluation.

Self-Assessment Questions

1. What was the average length of time for a comprehensive medication assessment conducted by the pharmacists?
2. How were the solution focused recommendations categorized to determine strength of pharmacist solution-focused recommendations?

Managing Anemia in the Elderly

Marisa Battistella, PharmD, University Health Network, Toronto, ON

Anemia is a common clinical problem at all ages but this is especially true among elderly. Its prevalence among adults increases sharply after the age of 60 years.

Anemia may represent a sign of serious disease and untreated anemia can have severe complications. Undiagnosed and untreated anemia is associated with an increased risk of mortality and a decreased quality of life.

In older people in general, the causes of anemia vary depending on the clinical setting. With development and usage of newer laboratory assays, the diagnosis of anemia is sooner and more precise, allowing for a variety of treatment options.

In this workshop you will learn how to evaluate anemia in the elderly, review the therapeutic options available for treatment and gain an understanding of how to monitor these therapies when caring for the elderly with anemia.

Goals and Objectives

1. To provide an overview of the pathophysiology and clinical presentation of anemia in the elderly.
2. To describe the laboratory values involved in the diagnosis of anemia.
3. To discuss the treatment options available for anemia
4. To understand the monitoring parameters needed in the care of the elderly patient with anemia

Self-Assessment Questions

1. What laboratory parameters are used for the diagnosis and monitoring of anemia in the elderly?
2. What are differences between iron replacement options for anemia in the elderly?
3. What are the differences between vitamin B12 products?

Neuropathic Pain Management- Identify & Treat it (Aggressively)

Donna K. Buna, BSc(Pharm), PharmD, Clinical Pharmacy Specialist – Geriatrics & Coordinator Pharmacy Education & Residency Practice, Vancouver Island Health Authority, Victoria, BC

Chronic pain syndromes are common in elderly patients and often include a neuropathic component. Neuropathic pain (NP) is classified into peripheral and central etiologies. NP is difficult to identify because of the wide spectrum of signs and symptoms that vary considerably between patients with similar etiologies. The Leeds Assessment of NP Symptoms and Signs (LANSS) scale, the DN4 pain questionnaire and the NP questionnaire were developed to help differentiate neuropathic from nociceptive pain. Verbal reporting of pain is sometimes difficult or unreliable in elderly patients and clinicians must often document pain behaviors and functionality to assess therapeutic interventions.

NP is also difficult to treat and may not respond to conventional analgesics and approaches. Drugs used to treat NP include antidepressants, anticonvulsants, opioid analgesics, N-methyl-D-aspartate (NMDA) antagonists, topical anesthetics and sodium-channel blockers. The bulk of evidence for efficacy in NP occurs with tricyclic antidepressants and anticonvulsants. However, more evidence is accumulating for topical anesthetics for focal neuropathies and NMDA antagonists for central neuropathies. No single drug works for all neuropathic pain states and given the diversity of etiologies and pain mechanisms, the development of concise treatment algorithms is difficult and treatment decisions must be individualized. Unrecognized or poorly managed NP will lead to anxiety, depression, sleep disorders, frailty, declining function and poor quality of life. Pharmacists can help identify neuropathic pain states in patients and recommend effective therapies that will preserve patient's function and quality of life.

Goals and Objectives

Following the completion of this presentation, the participant will be able to:

1. Define NP and differentiate it from other types of chronic pain based on clinical presentation.
2. To identify the common conditions and co-morbidities associated with NP.
3. Conduct successful pain assessments in patients demonstrating NP and mixed pain presentations.
4. To recommend appropriate pharmacotherapy to relieve NP.
5. To monitor for efficacy and adverse outcomes in patients prescribed therapies for NP.

Self-Assessment Questions

1. Name 3 conditions that are associated NP.
2. Describe common words used by patients to describe NP.
3. Name 4 drugs that have evidence for efficacy in NP.

Sunday, January 28, 10:00 – 15:00
Harbour Foyer

1. Development of an Electronic Teaching Tool on Chemotherapy Administration and Safety for the Medical/Surgical Intensive Care Unit Nursing Staff at St. Michael's Hospital
2. Development of a National Set of Medication Safety Indicators
3. A Multidisciplinary Approach to Improving Adherence to Cardiovascular Protection Therapy Guidelines in Patients with Chronic Kidney Diseases: One Team's Initiative
4. Implementation and Evaluation of a Pharmacy-based Heparin-Induced Thrombocytopenia Safety Improvement Initiative in Cardiac Surgery
5. Smoking Cessation Counselling with Aboriginals in Northern Interior British Columbia
6. Acceptability and Face Validity of a Geriatric Self-Medication Assessment Tool
7. The Implementation of a Structured Pharmacy Summer Student Program to Promote Hospital Practices as a Career Choice
8. Development of a Structured Integrated Medication Reconciliation Strategy from Hospital Admission to Discharge
9. Evaluation of Medication Discrepancies at a Hospital Discharge
10. A Retrospective Comparison of Variable Concentrations Versus Standardized Concentrations on a 24-hour Drug Infusion Volumes in a Paediatric Intensive Care Unit
11. Failure Mode Effects Analysis of the Pharmacy Preparation of Epidural Syringes
12. Implementation of Medication Reconciliation in a Paediatric Oncology Program

Monday, January 29, 12:15 – 14:15
Metropolitan Centre/East

1. Risk Evaluation of Clostridium difficile-Associated Diarrhea Following Antimicrobial Prophylaxis in Patients Undergoing Cardiac, Vascular or Thoracic Surgery in a Tertiary Care Trauma Center
2. Development of a Meditech®, Software-Based Pharmacist Clinical Workload Measurement System
3. Structuring an Early Clinical Experience for Pharmacy Students: Lessons Learned from the hospital Perspective
4. Fraser Health Authority Community Medication Management Program: First Year in Review
5. A Smoking Cessation Educational Program for Physician Residents
6. Clozapine Toxicity Associated with Smoking Cessation and Clarithromycin
7. Evaluation of a Discharge Medication Schedule: Impact on Seamless Care
8. Implementation of Hospira's Smart Pump Technology – First in Canada
9. Revue d'utilisation du Palivizumab dans un centre tertiaire
10. Variabilité des doses administrées lors de perfusions de petits volumes de médicaments en pédiatrie
11. Development and Evaluation of an Electronic In-Service Versus a Traditional In-Service
12. Acute coronary Syndromes Associated with the Use of Bupropion: Two case Reports

Tuesday, January 30, 12:15 – 14:15
Metropolitan Centre/East

1. Nursing Opinion of the Medication Distribution System
2. Capital Health Pharmacy Department Professional Development Program
3. Development of an Electronic Database Program to Assess Side Effects in Patients Receiving Capecitabine Chemotherapy
4. Evaluation of an Intravenous Erythropoietic Hormone Replacement Therapy Dosing Algorithm for the Treatment of Anemia in Hemodialysis Patients
5. Physicians' Changing Perceptions of Contributions to Medication Use Processes as Pharmacists Integrated into Family Practice
6. Examining Physicians' Perspectives During the Integration of a Pharmacists into Family Practice
7. Characteristics of Ganciclovir Resistant Cytomegalovirus in Solid Organ Transplant Recipients
8. Nephrotoxicity and Ototxicity with Inhaled Tobramycin
9. Evaluating the Contribution of a Pre-printed Order, Multidisciplinary Collaboration and Staff Education in the Utilization of Drotrecogin Alpha Activated (Drotrecogin) in a Community Hospital Intensive Care Unit (ICU) Setting
10. Development and Implementation of an Admission Medication Reconciliation Education and Certification Program for Pharmacists
11. Medication Incident Reporting: Is it a Means to an End?

Wednesday, January 31, 10:15 – 15:00
Harbour Foyer

1. Fostering Curiosity and Promoting Research in a Clinical Setting: The creation of Research Capacity
2. Palliative care Drug Fact Sheets: An Educational and Safety Initiative to Support Nurses and On-Call Physicians
3. Efficacy of a Point-of-Care INR Device Compared to Laboratory Testing in Patients Starting on a Warfarin Nomogram
4. Canadian Cost-Effectiveness Analysis of Bortezomib in Relapsed or Refractory Multiple Myeloma Patients
5. Impact of an Institutional Order Form on Improving Antimicrobial Use
6. Teaching Teaching Skills: The Development and Assessment of an Educational Program for Pharmacy Residents and Staff Pharmacists
7. Visual Hallucinations Associated with Voriconazole: A Case Report
8. Expanding Beyond the hospital: Developing Pharmacist Services in a Regional Geriatric Program
9. Adequacy of Antidote Stocking in British Columbia Hospital: The 2005 Antidote Stocking Study
10. Impact of a Pain Management Practice Guideline on Narcotic Administration in Emergency Department Patients Undergoing Trauma Team Activation
11. Using Personal Digital Assistant-Based Electronic Forms to Facilitate Research Data Collection at the Point-of-Care

Sunday, January 28 • Dimanche 28 janvier

Development of an Electronic Teaching Tool on Chemotherapy Administration and Safety for the Medical/Surgical Intensive Care Unit Nursing Staff at St. Michael's Hospital

C. Dara, S. Ong-Cosway, St Michael's Hospital, Toronto, ON

There is increasing use of chemotherapeutic agents for both malignant and non-malignant indications within the Medical/Surgical Intensive Care Unit (MSICU) of St Michael's Hospital (SMH). Administration of chemotherapeutic agents is considered an advanced nursing competency. Nurses who administer these agents must undergo didactic and experiential education in order to be certified. Due to the large number of MSCIU nursing staff and the relatively infrequent requirements to administer these agents, competency could not be maintained. However, it was deemed that they required education and support that could be readily accessed to ensure the safe handling and administration of chemotherapy.

A collaboration between a MSICU nurse and oncology pharmacist resulted in the development of five multimedia modules using Macromedia Captivate®. This program allowed the synchronous use of slides with audio, the ability to proceed on cue, and the option to develop interactive quizzes. Modules were designed to last approximately 5 minutes to allow the nurse to set their own learning pace while minimizing the time away from clinical care. Content for the modules was identified by feedback from the MSICU staff nurses during introductory in-services on the current hospital chemotherapy policy and procedures. Specific to the MSICU, the streamlined modules covered the topics of "Calculating body surface area and chemotherapy dosages", "Vesicants, irritants, and extravasations", "Naso-gastric/ oral-gastric administration", "Safety", and "Helpful teaching hints" for chemotherapeutic drugs. The information and ease of use of the tool was validated by a MSICU nursing education coordinator as necessary, appropriate, and user-friendly.

This project highlights the collaborative efforts of a MSICU nurse with an oncology pharmacist in developing a tool to help improve staff knowledge and enhance patient care with regards to chemotherapy handling and safety. The use of the electronic tool is a readily and rapidly accessible source of information in the MSICU.

Development of a National Set of Medication Safety Indicators

Tiffany T. Nguyen[1], Rita Nigam[1], Neil J. MacKinnon[1], Nicole R. Hartnell[1], Adrian Levy[2], Mary Ellen Gurnham[3], and David U[4]

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[4]Institute for Safe Medication Practices – Canada, Toronto, ON

Reason for Initiative: Indicators, or performance measures, are used frequently to measure health system structures, processes and outcomes. At this time, a set of Canadian indicators related to the safety of the medication use system is lacking. The objective of this study was to develop a list of consensus-approved medication safety indicators based on input from experts in medication safety across Canada.

Description of Initiative: First, a literature review was performed and a list of medication safety indicator candidates was identified and pilot tested. Then using a consensus-generating method called the Delphi Technique, the list was presented to twenty nationally recognized experts in patient safety and medication use to generate a set of Canadian medication safety indicators.

Evaluation of Initiative: Based on the literature review and pilot test, 41 indicators were identified and presented to the national panel. In round one, members of the panel had the opportunity to comment on and add additional indicators, which resulted in 54 indicators for round two. Out of the 54 indicator candidates, 20 indicators achieved consensus after three rounds of the Delphi Technique.

Importance and Usefulness of Initiative for Pharmacists: The indicators developed will be used to measure the safety of medication use in Canada. In the second phase of this study, a regional panel of 17 representatives from four Atlantic Canadian health authorities will prioritize the 20 indicators, and the five indicators ranked as most important will be tested for feasibility, reliability and validity in the four health authorities over six month period. Ideally, if validated, these indicators could be used by pharmacists and others across Canada to improve the safety of the medication use system.

A Multidisciplinary Approach to Improving Adherence to Cardiovascular Protection Therapy Guidelines in Patients with Chronic Kidney Disease: One Team's Initiative

Gigi Wo RPh, B.Sc.Pharm, Lakeridge Health, Whitby, ON, Hilary Jennings RPh, B.Sc.Pharm, Mount Sinai, Toronto, ON, Dr. Andrew Steele MD, FRCPC, Lakeridge Health, Whitby, ON, Lynn McArthur, CPHT, Lakeridge Health, Whitby, ON

Chronic kidney disease (CKD) is associated with high risk of cardiovascular morbidity and mortality. Several classes of medications have been shown to confer cardiovascular protection (CVP) in patients at high risk of cardiovascular disease (CVD): inhibitors of renin angiotensin system (RAS), anti-platelet agents (APA), beta-blockers (post MI/CHF) and statin lipid lowering medications. Observational studies have shown that these CVP agents are under-prescribed in patients with CKD despite the recommendations of published evidence based guidelines. The goal of this initiative was to assess and improve the team's adherence to current guidelines for CVD protection in patients with CKD. This was a cross sectional study of 399 CKD patients. A standardized evaluation form was developed to identify patients who were missing one or more CVP medications. Pharmacists, pharmacy technicians and registered nurses participated in the completion of the evaluation form for each patient. Reasons for the absence of particular therapies if known were recorded. Each patient's evaluation form was then reviewed by a Nephrologist allowing for changes to therapy if indicated. The number and type of CVP agents prescribed for each patient were collected before and after intervention. Amongst the 399 CKD patients, 337 (84.4%) were on a statin lipid lowering agent; 334 (83.7%) were on RAS agent; 283 (70.9%) were on an APA. After intervention, 362 (90.7%) patients were on a statin; 358 (89.7%) were on RAS agent; and 317 (79.4%) were on an APA. B-Blocker therapy was assessed in 98 peritoneal dialysis (PD) patients. Of the 30 PD patients with history of MI or CHF, 22 (73.3%) were on a B-Blocker

and no change after intervention. There exists a high level of use of CVP agents amongst the CKD patients in our dialysis program. With multidisciplinary involvement, the evaluation form was effective in further increasing the use of CVP agents.

Implementation and Evaluation of a Pharmacy-Based Heparin-Induced Thrombocytopenia Safety Improvement Initiative in Cardiac Surgery

Claudia Bucci[1,2], Andrew Sinclair[1], Sherri Tawfik[1], Bill Geerts[3], Mary Pahk[1], Bill Bartle[1,3]

[1]Department of Pharmacy
[2]Division of Cardiology
[3]Department of Thromboembolism, Sunnybrook Health Sciences Centre, Toronto, ON

Rationale: Heparin-induced thrombocytopenia (HIT) is a potentially devastating complication of heparin treatment that is most commonly encountered following cardiovascular surgery (CVS). Almost all patients who undergo CVS routinely receive unfractionated heparin (UFH). We implemented a program to reduce patient exposure to UFH and to possibly also reduce the risk of HIT.

Objective: The primary objective of this initiative is to improve patient safety following CVS. The safety and efficacy of a low molecular weight heparin (LMWH) anticoagulation protocol after heart valve surgery was also evaluated.

Methods: Based on a literature review of the risks and consequences of HIT in CVS, we concluded that the only way to reduce the burden of HIT was to reduce exposures to UFH. Several practice changes were implemented; including multidisciplinary HIT education, removal of UFH from central venous and peripheral arterial line flushes, removal of UFH from relevant nursing units and creation of new standard orders. UFH was replaced by LMWH for thromboprophylaxis and for therapeutic anticoagulation after CVS. In addition, a protocol for anticoagulation of heart valve replacement patients with LMWH instead of UFH was implemented. In the heart valve population, we performed a retrospective evaluation of patients managed with UFH or LMWH to assess the effects on efficacy and safety.

Results: This initiative has reduced exposure to UFH in the CVS patients at our institution. Review of the LMWH regimen after heart valve surgery suggests that LMWH was as effective and safe as UFH. The risk of HIT and associated thrombotic complications appeared to be lower in the patients who received LMWH compared to UFH.

Conclusion: This initiative has substantially reduced avoidable exposures to UFH and may well reduce the risk of HIT in CVS patients. Furthermore, our pilot study provides support for the use of LMWH after heart valve surgery.

Smoking Cessation Counselling with Aboriginals in Northern Interior British Columbia

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Rationale: In Canada, cigarette smoking kills an average of 125 individuals every day. In the Aboriginal population there is nearly double the smoking prevalence. Community Health Representatives (CHRs) are band members employed to facilitate between community members and the health care team.

Objectives: To identify Aboriginal perceptions, approach, tools, environment and challenges related to smoking cessation counselling in order to develop recommendations.

Study Design and Methods: Using a focus group, ideas, experiences and insights were explored around the objective theme areas. Permission and consent was obtained to have CHRs from surrounding bands participate. Data transcripts were returned to participants for validation and reviewed for emergent themes.

Results: Seven CHRs participated in one focus group. Most CHRs, as well as other health workers in their communities, were current or past smokers. CHRs give support/information to smoking members of the community if approached. Tobacco has traditional uses in ceremonies, prayers and medicine, however cigarettes are recognized as a harmful addiction. There were many misconceptions about nicotine replacement therapy (NRT).

Conclusion: There were few new recommendations at this time. It was identified that CHRs and community members require education on NRT, stage-based interventions, withdrawal symptoms, and motivational interviewing. Potential exists to develop storytelling videos.

Acceptability and Face Validity of a Geriatric Self-Medication Assessment Tool

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Rationale: A majority of older adults are community dwelling and are independently managing a medication regimen. Difficulties in this area can put health at risk and can increase costs to the heath-care system. The present study was part of a larger project aiming to develop a Self-Medication Assessment Tool (SMAT) designed to screen for self-management deficits (functional and cognitive) and facilitate targeted interventions. in geriatric patients.

Objective: This study was designed to evaluate the face validity of the SMAT and to determine its acceptability among pharmacists.

Methods: Participants were recruited using a standardized e-mail sent to hospitals and community pharmacies. The primary researchers were blinded to the identity of the participants. A semi-structured interview format, a demographic survey and a series of 4 rating questions were used to determine pharmacists' reactions to the components of the tool and willingness to use it. Main ideas were organized and coded for content analysis. A series of independent-groups t-tests were applied to the rating questions responses.

Results: Six focus groups and 4 individual interviews were conducted with 17 pharmacists and 3 pharmacy students. Content analyses indicated that the participants felt the tool would be useful in identifying medication management difficulties, that it was thorough, and that participants would be willing to adopt its use in their practice. Analysis of the rating questions indicated that pharmacists currently working in the hospital setting, and those who had spent the majority of their career in this setting, were more willing to use the tool. Finally, additional content analysis of the focus group transcripts were used to highlight ways that the

tool could be improved and identify areas respondents felt were particularly strong.

Conclusions: The results indicated that the SMAT had strong face validity and was particularly acceptable for use by pharmacists in hospital settings.

The Implementation of a Structured Pharmacy Summer Student Program to Promote Hospital Practice as a Career Choice

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Pharmacy summer students are potential recruits for both residencies and hospital practitioners. Traditionally, summer student responsibilities have been technical in nature. A structured pharmacy summer student program was developed to ensure that students were aware of the clinical roles of hospital pharmacists.

The objectives of the program were: to provide students with the opportunity to observe the roles of clinical pharmacists in direct patient-care settings, to develop students' presentation skills, and to allow students to participate in projects with a clinical focus.

Throughout the summer, pharmacy students were assigned to shadow clinical pharmacists for 1 to 5 days in different areas and were provided with the opportunity to deliver direct patient care. A project that supported pharmacy practice was completed under the supervision of a pharmacist. In addition, each student presented a 15 minute seminar on a health-related topic to pharmacy staff members. Finally, sessions were held with pharmacist practice leaders to discuss the various roles and educational opportunities available. These activities were scheduled for a total of 4 weeks, interspersed within their 14 week summer studentship.

Over a 5 year period, 24 students completed a written evaluation of the program. The majority of students, 91% agreed that they are more likely to pursue a career within hospital pharmacy because of the program, 79% agreed that they were more likely to pursue a hospital residency, and 91% agreed that the program expanded their knowledge of various career paths within hospital pharmacy.

The program has been found to be a successful tool for educating pharmacy students about the opportunities in hospital pharmacy.

Development of a Structured Integrated Medication Reconciliation Strategy from Hospital Admission to Discharge

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Purpose: Medication discrepancies can occur frequently at hospital admission and discharge. These discrepancies are important as they may contribute to drug related problems and adverse drug events. This study aims to develop a multi-disciplinary structured integrated medication reconciliation strategy from hospital admission to discharge.

Methods: Key elements of the development were a baseline measurement of discharge medication discrepancies (n=149), a literature review, and a needs assessment. The needs assessment consisted of interviewing experienced pharmacists in the field of medication reconciliation (n=9) and consulting key stakeholders (n=7) that included physicians, nurses, and pharmacists. The combined information was used to create an optimal multi-disciplinary practice model to reduce medication discrepancies.

Results: The strategy consists of a synchronized electronic platform to support a multi-disciplinary practice model that includes admission and discharge reconciliation. On discharge, an electronic medication information transfer system generates a computerized prescription, a letter used to communicate hospital medication information to community healthcare professionals, a patient medication grid, and a patient medication wallet card. The electronic system facilitates electronic collection and transfer of medication information from the time of admission to discharge to facilitate admission medication reconciliation and also discharge medication reconciliation. It also allows for coding of medication discrepancies.

Conclusion: Through the use of a baseline evaluation of discharge medication discrepancies, a literature review, and a needs assessment, a structured integrated medication reconciliation strategy was created. This synchronized strategy may reduce medication discrepancies. It is anticipated that this strategy can be adapted to other institutions.

Encore Presentation

Evaluation of Medication Discrepancies at Hospital Discharge

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Purpose: Hospital discharge is an interface of care where patients are at a high risk of medication discrepancies as they transition from hospital to home. This study aimed to identify and characterize medication discrepancies at hospital discharge.

Methods: All consecutive patients admitted for at least 72 hours to the general internal medicine wards at a tertiary care teaching hospital were prospectively assessed. Patients were excluded if they were discharged with verbal prescriptions from the physician, transferred from a nursing home or another institution, transferred from or to another hospital unit, or passed away during hospital stay. The primary endpoint of the study was to determine the number of patients with at least one unintended medication discrepancy on hospital discharge. Medication discrepancies were assessed through a comparison of a best possible medication discharge list and the actual discharge medication prescriptions. The discrepancies were characterized according to standardized criteria.

Results: From March 14, 2006 to June 2, 2006, 468 patients were screened for eligibility and 149 patients were included in the study. Sixty-two patients (41.6%) had at least one unintended medication discrepancy at hospital discharge. The most common medication discrepancies were an incomplete prescription requiring clarification that may result in a patient delay in obtaining medications (49.5%) and the omission of medications (22.9%).

Conclusion: Medication discrepancies occur commonly on hospital discharge. Understanding the type and frequency of discrepancies can be used to help health care professionals better understand ways to prevent them. This study highlights the need for

structured medication reconciliation to prevent discharge medication discrepancies.

Encore Presentation

A Retrospective Comparison of Variable Concentrations Versus Standardized Concentrations on 24-hour Drug Infusion Volumes in a Paediatric Intensive Care Unit

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Rationale: Current guidelines recommend limiting and standardizing the number of drug concentrations available for IV infusions. Within the paediatric setting, fluid volume is an important consideration and concern exists regarding the possibility of increased 24-hour fluid volume intake by instituting standardized concentrations (SC).

Objectives: To establish that the drug infusion volume administered to Paediatric Intensive Care Unit (PICU) patients using the proposed SC will be no more than 10% greater than using current variable concentration infusions over a 24-hour period.

Methods: A retrospective chart review of PICU patients was performed in order to calculate the 24-hour fluid volume related to IV drug infusions and compare this with the calculated volume that would be administered if SC were used.

Inclusion Criteria

- PICU patients receiving ≥ 1 continuous IV medication infusion(s) of a variable concentration drug.

Exclusion Criteria

- PICU patients with a weight ≥ 20 kg.

Results: A total of 91 variable concentration drug infusions (49 patient charts) were reviewed. Seven different drugs were identified and the total 24-hour fluid volume associated with each was calculated. A comparison with the calculated fluid volume using the proposed SC resulted in the following mean percent changes in fluid volumes: Dopamine (-20.05% +/- 20.94% n=13); Epinephrine (-8.68% +/-29.43% n=7); Fentanyl (4.17% +/- 33.43% n=12); Midazolam (0.0% +/-0.0% n=13); Milrinone (-23.10% +/- 16.92% n=13); Morphine (-1.20% +/- 46.99% n=30), Vasopressin (-28.33% +/-10.41% n=3).

Conclusion: The majority (83.5%) of SC drug infusion volumes were no more than 10% greater than those using variable concentrations which has allayed for the most part the concern regarding potential increased fluid intake

Failure Mode Effects Analysis of the Pharmacy Preparation of Epidural Syringes

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Reason: To systematically and proactively evaluate the high-risk process of epidural analgesic syringe preparation.

Description: The Failure Mode Effects Analysis (FMEA) process involves 8 essential steps: 1) Selection of process/team: 2) Diagram the process 3) Brainstorm potential failure modes (FM) and their effects 4) Identify causes of FM 5) Prioritize FM 6) Re-design the process 7) Analyze and test the new process 8) Implement and monitor the new process. The team consisted of 3 pharmacists, 2 pharmacy technicians, 1 pharmacy aide, 1 RN, and 1 project manager: Five 2-hour sessions were conducted, identifying 5 processes and 46 potential FM with their causes and effects. FM were classified according to a Risk Priority Number (RPN) = severity (1-5) x detectability (1-4) x frequency (1-5) in order to assign a numerical classification of risk. FM with severity ratings of 5 are required to be addressed. 12 FM had a severity rating of 5 (one already had effective measures in place) with an associated RPN ranging from 5 to 60. Of the remaining FM the RPN score varied from 1.5 to 12, 11 improvement recommendations addressing the FM with a severity of 5 were proposed and are in various stages of implementation.

Importance and Usefulness of Initiative: The FMEA enabled the pharmacy to update the IV room processes and implement patient safety checks. Upon completion of the pharmacy initiated FMEA the working group recommended that an institution wide FMEA for the entire epidural process be initiated.

Implementation of Medication Reconciliation in a Paediatric Oncology Program

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Introduction: Complete patient medication history at time of admission or transfer is essential in order to ensure optimal patient safety and care. In order to improve patient safety, the pharmacy department, in collaboration with the oncology clinic, implemented a medication reconciliation project. Over a 3-month period, oncology pharmacists were integrated into the oncology clinic admission process to collect patient medication information.

Background: CPSI, ISMP, and the Joint Commission Resources (JCR) recommend implementing medication reconciliation programs to optimize patient safety and facilitate continuity of care. Evidence has shown that pharmacists have the optimal knowledge and skills required to perform patient medication histories. The goal is to reduce medication errors and eliminate the need to clarify orders by allowing a pharmacist to acquire a patient's medication history.

Program Description: The oncology medical director has sent out a formal letter to the parents of oncology patients to inform them about the project and to encourage them to bring their child's current medications. The paediatric oncology clinic pharmacist meets with the patients and their parents as part of the admission process prior to being seen by the physician. The pharmacist reviews and documents: prescription medications; OTC's; alternative therapies; drug-related problems and compliance issues. The pharmacist writes the medication admission orders, which are signed and modified if needed by the physician. Since March 6th 2006, over 95% of medication histories have been obtained by an oncology pharmacist. Physicians and nurses have facilitated dedicated time for consultation with the pharmacist. The medical team now relies on the pharmacist to document an accurate medication history.

Summary: The implementation of the medication reconciliation program has reduced order omissions and clarifications requiring interventions by the oncology pharmacist. As part of a multidisciplinary team, the paediatric oncology pharmacists are now actively involved in the admission process.

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Risk Evaluation of Clostridium difficile-Associated Diarrhea Following Antimicrobial Prophylaxis in Patients Undergoing Cardiac, Vascular or Thoracic Surgery in a Tertiary Care Trauma Center

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Background: Since 2002, a C. difficile associated diarrhea (CDAD) outbreak has been affecting institutions in the Canadian province of Quebec. CDAD has since become the most common nosocomial infection diagnosed. The purpose of this study is to evaluate the risk of CDAD and its complications following antimicrobial prophylaxis (AP) in patients undergoing cardiac, vascular or thoracic surgery at a university affiliated tertiary care trauma center.

Methods: We reviewed the charts of patients aged 18 years or older and who received an AP for surgery between January 1st 2002 and December 31st 2004. The primary outcomes were the occurrence of CDAD and its complications and the occurrence of surgical site infections (SSI). Rates were estimated with their 95% confidence intervals (CI). AP conformity was also documented.

Results: Overall, 1524 charts were reviewed. In total, 837 cardiac, 335 thoracic, and 352 vascular surgeries were evaluated. CDAD and SSI rates are presented in the following table. Rate of complications associated with CDAD was 20.8 % (95% CI 12.7-28.9 %).

Rates of CDAD and SSI in cardiac, thoracic and vascular surgery patients

Outcome	Cardiac n = 837	Thoracic n = 335	Vascular n = 352	Total n = 1524
CDAD (%) (95%CI)	4.3 (2.9-5.7)	10.2 (6.9-13.4)	7.1 (4.4-9.8)	6.3 (5.1-7.5)
SSI (%) (95%CI)	4.1 (2.7-5.4)	0.9 (-0.1-1.9)	5.1 (2.8-7.4)	3.7 (2.7-4.6)

Conclusions: AP exposes patients to an increased risk of CDAD. This risk may outweigh its benefit, especially in thoracic surgery. AP needs to be re-evaluated in the context of CDAD outbreaks, and more specifically in surgeries at low risk of SSI. Improving surgical methods is required to alleviate the necessity of AP in specific situations.

Development of a Meditech® Software-Based Pharmacist Clinical Workload Measurement System

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Rationale: Implementation of a new pharmacy computer system allowed for creation of a pharmacist workload measurement system that focused on pharmacist direct patient-care interventions. We describe the workload and outcomes measurement system developed within Meditech® software, and demonstrate its use in a community hospital.

Description and Implementation of System: A numerical, computerized system for recording workload when documenting interventions in the patient's chart was developed. Interventions were categorized according to nature of drug-related problem, proposed patient outcome and acceptance by prescriber. The clinical interventions of staff pharmacists' were quantitatively described over a six-month period. The data was extracted out of Meditech® using an in-house designed report and imported into Microsoft Excel® for data tabulation.

Evaluation: Fourteen pharmacists tabulated 2645 interventions from January to June 2006. There was a mean of 4.6 ± 3.4 interventions per pharmacist per clinical shift. A broad range of drug related problems were identified. For every intervention, 1.4 clinical, 0.8 humanistic and 0.1 economic outcomes were recorded. Only 3.2% of recommendations were rejected by prescribers at the time of documentation.

Usefulness to Practice: Numerous drug-related problems were identified by pharmacists with various proposed outcomes. Most pharmacist interventions were accepted by prescribers. Our workload measurement system allowed pharmacists to document their clinical activities and incorporate the proposed patient outcomes of their interventions in a format that is usable to external pharmacy stakeholders and hospital administrators.

Structuring an Early Clinical Experience for Pharmacy Students: Lessons Learned from the Hospital Perspective

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Background: A revised curriculum and integration of internship hours and experiential training resulted in a new two-week hospital rotation for second year pharmacy students.

Objective: To develop and evaluate a new hospital rotation designed to introduce the clinical role of the hospital pharmacist and provide direct patient care experience to second year pharmacy students.

Description: Modeled on our clinical pharmacy student summer program, the rotation consisted of 3 days of regionally organized teaching sessions for specific clinical skills (i.e., medication history, allergy assessment), drug information skills and a distribution orientation. One half day was spent in a specialty practice and the remainder with a preceptor observing and practicing clinical skills.

Evaluation: Verbal feedback concerning the program was obtained in separate structured group discussions with preceptors and the 36 students who completed their rotations in Capital Health (CH) in 2006.

Results: Due to limited exposure to core therapeutic lectures, it was felt that the focus of the rotation should be on building basic clinical skills rather than teaching therapeutics. It was also felt that the drug information sessions should focus more on the electronic references available within the University, rather than primary literature searching to which the students have had prior exposure. The session on drug distribution needs to be more practical and hands-on and finally, although beneficial the specialty practice visits will not be expanded as since the focus tended toward the medical specialty rather than the role of the pharmacist. Efforts will be

made to ensure sessions are scheduled to minimize time lost to commuting.

Implications: A regionally structured model for early clinical experience which explores the clinical role of the hospital pharmacists and builds basic clinical skills is beneficial from the perspective of pharmacy students and staff.

Fraser Health Authority Community Medication Management Program: First Year in Review

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Rationale: Recent literature has highlighted medication related problems that can occur in individuals after discharge from hospital, as well as, the benefit of a home visit by a pharmacist to reduce further hospitalization. In response to this, Fraser Health Authority (FHA) has initiated a community medication management program (MMP).

Description of Service: There are currently four pharmacists in FHA who are providing the MMP service. The MMP primarily involves these pharmacists visiting patients recently discharged from a hospital. The patients eligible for a home visit (HV) are those who are at least 65 years and discharged on at least six regularly scheduled medicines. The pharmacists also receive referrals to see patients from other sources such as Home Health in each of the areas and the Elder Health Program.

Implementation and Evaluation: In order to evaluate the MMP clinical outcomes after its first year, data were collected to determine the impact of the HV's.

Results: During the first year of the program, 483 patients received a HV, of which 301(62.3%) were female. The average age of those who received a HV was 80.1 years. There were 681 HVs, from which the pharmacists made 1685 recommendations for medication regimen changes and 1244 (73.8%) were accepted. The pharmacists provided medication education during 605 visits, cleared cabinets during 190 visits, recommended a compliance aid during 260 visits and requested laboratory testing after 126 of the visits. During 244 of the HVs, the pharmacists performed a non-pharmacological intervention such as checking blood pressure or blood glucose, requesting special authority for medicines, reporting an adverse drug event or referring the patient to another healthcare provider.

Future Practice: Evaluation of the economic and humanistic outcomes of the MMP is planned. Opportunities to expand the MMP to other FHA communities are being sought.

A Smoking Cessation Educational Program for Physician Residents

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Purpose of Educational Activity: Cigarette smoking is the leading contributor to premature death, illness and healthcare expense. Despite this fact, the family practitioner has received little, if any training at on how to provide behaviour modification and pharmacological treatment for smoking cessation. At St. Michael's Hospital, a multidisciplinary smoking cessation clinic was developed with the participation of the Family Practice Residents. In order for this to occur, residents had to have adequate knowledge and for this reason an educational program was developed and implemented.

Description of Educational Program: Residents were provided with a "training package" consisting of articles regarding the theory and treatment of nicotine dependence, treatment guidelines and a therapeutic option chart. They attended an orientation session where these materials, in addition to assessment and documentation forms were discussed. Residents completed a pre- and post quiz that consisted of multiple choice and true/false questions. Prior to independently assessing and treating a patient, residents observed a minimum of two counseling sessions, in addition to didactic learning.

Results: A total of ten physicians participated in all aspects of the pilot project. The average change in quiz scores was an increase of 27% (range: 0%-55).

Importance: With the changing curriculum of medical schools, many areas are not being formally covered. It is important that physicians have adequate pharmacotherapeutic knowledge to ensure optimal therapy is prescribed. One way is to develop target education programs, such as the one above. This newly acquired knowledge can be taken into the resident's future practices to ensure the cycle continues for helping patients to stop smoking.

Clozapine Toxicity Associated with Smoking Cessation and Clarithromycin

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Rationale: Clozapine can be highly effective in treating refractory schizophrenia, however the potential for serious adverse events significantly limits its use. We describe a case of clozapine toxicity associated with smoking cessation and clarithromycin.

Description: A 49 year-old man with chronic schizophrenia (stable with clozapine for 2 years) and a 33 pack-year smoking history was admitted to London Health Sciences Centre with empyema. 3 days prior, he had presented to Strathroy Hospital with a 5-day history of chest pain, shortness of breath, cough, chills, fatigue, anorexia and fever. He was admitted and treated for pneumonia with clarithromycin and ceftriaxone but developed a pleural effusion and was transferred to LHSC for surgical drainage and lung decortication. On day 3 the patient was excessively sedated. Doses of opioid analgesics were decreased, with little improvement in the patient's orientation status. On day 5 the serum clozapine level was 6198 nmol/L (concentrations above 3100 nmol/L are associated with CNS toxicity), and the clozapine dose was decreased from 550 to 300 mg/day. By day 7 the patient was more alert, and he was discharged home the following day. The patient has since resumed smoking and is again maintained on clozapine 550 mg/day.

Analysis: Clozapine is extensively metabolized by hepatic cytochrome P450 enzymes, primarily CYP1A2 and CPY3A4. Chemicals in tobacco smoke induce many CYP450 enzymes, including CYP1A2. Since the patient had abstained from smoking while in hospital, this effect may have become diminished. Additionally, macrolide antibiotics such as clarithromycin are potent inhibitors of CYP3A4. Both of these factors likely contributed to a reduction in clozapine metabolism, leading to an increased serum concentration and resulting toxic effects.

Importance to Pharmacy Practitioners: Pharmacists should be alert to factors that can alter clozapine metabolism, able to quickly recognize signs of toxicity, and prepared to recommend dosage adjustments as required.

Evaluation of a Discharge Medication Schedule – Impact on Seamless Care

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Rationale: The transfer of patient information from hospital to community has been shown to help improve patient care.

Objective: To evaluate the usefulness of a pharmacy Discharge Medication Schedule (DMS) and its impact on facilitating seamless care from three perspectives: the discharged patient, their community pharmacist, and their family physician.

Methods: A prospective descriptive study was conducted using structured surveys as an evaluation tool. Copies of the DMS were provided to the patient, family physician and community pharmacist. Physicians and pharmacists were asked to complete written surveys, while patients completed telephone surveys. Community pharmacies were contacted to compare the patient's discharge medications and medication profile. All patients discharged home from the Henderson General Hospital's general medicine wards during April 2006 who received a pharmacy DMS were recruited to participate in the study. Descriptive statistics were used for analysis of the survey results.

Results: 18 patients were recruited in total; 14 were eligible for the telephone survey. Response rates were 71%, 94%, and 78% for patients, pharmacists and physicians respectively. Positive feedback was received from all three groups. 100% of patients found the DMS helpful as a reminder tool and wanted to see a pharmacist and receive a DMS upon any future discharge. Over 76% of pharmacists referred to the DMS when reviewing their patient's profile and during counseling. Over 86% of physicians found the DMS useful in providing follow-up care and felt better informed about their patient's medication changes. 67% of profiles reconciled matched to the DMS provided to the patient.

Conclusion: The DMS was an effective tool to facilitate seamless care and was well supported by patients, community pharmacists, and family physicians. However, gaps still exist in the seamless care process that are not addressed by the DMS alone and additional tools may be required to address these gaps.

Implementation of Hospira's Smart Pump Technology – First in Canada

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Serious and life-threatening medication-infusion errors have occurred with the use of traditional intravenous (IV) pumps. However, recent advances in infusion technologies (i.e. smart pumps) provide safeguards to avert potential errors in the form of pre-programmed medication dosing limits built in the drug library. The Scarborough Hospital (TSH) recently implemented this technology.

The initial phase involved evaluation of various smart pump technologies currently available on the market. Using a scoring system, a multi-disciplinary team assessed vendor qualities, functionality, cost, safety features, and possibility of risk/error. The final decision was to purchase the Hospira Plum A+® with Mednet® using wireless mobile technology, making TSH the first institution in Canada to implement their product.

Implementation was a multidisciplinary process. Pharmacists were responsible for building the custom drug library for 13 different clinical care areas and guiding the organizational practice decisions required. The key considerations were patient-safety, reduced risk of errors, evidence-based and consistent practice across two hospital sites. Decisions required included: standardization of medication concentrations, dosing units, nomenclature, dosing limits, and revisions to the hospital IV drug manual. Pharmacists were also involved in developing policies and procedures, creating educational aids, and training internal staff. As of June 2006, 423 single smart pumps were fully utilized at TSH.

Our institution is currently evaluating the safety impact of these pumps. The system is capable of identifying averted errors in an electronic record that can be downloaded and analyzed for continuous quality improvement (CQI) purposes. The drug library will be continuously modified based on CQI data, formulary revisions, and on-going feedback from the nurses. We believe the implementation of the smart pumps will avert medication-infusion errors and enhance patient safety at our institution.

Revue d'utilisation du Palivizumab dans un centre tertiaire

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Introduction : Le palivizumab est utilisé pour l'immunisation passive contre le virus respiratoire syncytial (VRS).

Objectif : Décrire le profil d'utilisation du palivizumab et évaluer la conformité de la prescription aux critères d'Héma-Québec.

Méthodologie : Étude rétrospective des dossiers des patients immunisés entre le 1-10-2005 et le 30-04-2006. Analyse descriptive de la population immunisée (démographie, dose reçue, présence d'une hospitalisation, infection par le VRS). L'étude de conformité est axée sur la comparaison des données fournies par le CHU Sainte-Justine à Héma-Québec pour l'obtention du médicament et des informations retrouvées dans le dossier du patient.

Résultats : Un total de 190 patients ont été immunisés pendant cette période. Ils sont nés en moyenne à 33,7 semaines de grossesse et 49% étaient des garçons. La posologie moyenne par dose est de 14,8 mg/kg. Parmi ceux-ci, 84 patients ont été hospitalisés dont 12 ont été détectés positifs pour le VRS. Parmi eux, 4 patients ont été infectés alors qu'ils avaient débuté leur immunisation, 3 n'étaient pas immunisés et 3 ont eu une infection à VRS durant le séjour post-partum. Les deux autres patients ont reçu des doses de palivizumab hors de HSJ excepté lors de leur hospitalisation. Près de 100% des données colligées aux dossiers des patients sont conformes aux critères de demande de prophylaxie.

Conclusion : Le profil d'utilisation du palizivumab est généralement conforme aux critères proposés par Héma-Québec. La procédure mise en place au CHU Sainte-Justine est efficace pour assurer une conformité avec les critères d'Héma-Québec. Il serait possible d'optimiser la période de couverture des patients chez qui un délai de 28 jours est observé avec le moment où la première dose devrait être administrée.

Variabilité des doses administrées lors de perfusions de petits volumes de médicaments en pédiatrie

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Introduction : L'administration de doses de médicaments de moins de 1 mL par voie intraveineuse est problématique en pédiatrie.

Objectif : Évaluer la quantité résiduelle de NaCl 23,4 % dans la tubulure primaire selon le site d'injection, le volume injecté et le débit du soluté primaire pour déterminer un mode d'administration des doses de médicaments de 1 mL ou moins.

Méthodologie : Étude pilote expérimentale sans administration au patient. Injection de NaCl 23,4 % de 0,1 à 1,0 mL en duplicata dans le site proximal ou distal (capacité de tubulure de 1mL et 5mL) d'une tubulure principale (Signature Édition 72003 ® – 215 cm) installée sur une pompe Signature ® 22737, Alaris. À partir d'un soluté primaire d'eau stérile avec débit de 5 et 10 mL/heure, un seul opérateur a injecté les volumes. Après délais applicables (1 à 40 minutes), on a prélevé au site un volume de liquide de 1 mL (site proximal) et de 5 mL (site distal) et mesuré la quantité résiduelle de NaCl par conductimétrie.

Résultats : 208 injections et mesures de NaCl ont été réalisées. On a calculé un profil des quantités théoriques et réelles pour chaque point. Au 1er site, plus de 90% de la dose est administrée après 10 minutes de perfusion avec un débit de 5 mL/h alors qu'aucune quantité n'est perfusée au second site selon les mêmes paramètres. Au second site, en moyenne plus de 50 % de la dose est perfusée en 25 minutes avec un débit de 10 ml/h et jusqu'à 90% en 40 minutes.

Conclusion : Il existe une grande variabilité entre les temps de perfusion théorique et réel de doses de moins de 1 mL administrées par voie directe via la tubulure primaire. Une étude sur le terrain portant sur la sécurité et la faisabilité d'un tel mode d'administration doit être effectuée.

Development and Evaluation of an Electronic In-Service Versus a Traditional In-Service

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Background: Education is an important component of clinical pharmacy practice. The principal method of delivering education to the nursing staff by pharmacists is by giving presentation in-services. However the attendance rates of these in-services are often low. Electronic learning can meet some of the logistical challenges associated with organizing traditional presentation in-services.

Objective: To develop and evaluate the effectiveness of an electronic in-service (eInservice) in terms of knowledge retention and learner satisfaction.

Methods: Six nursing units were block-randomized into either a Presentation arm where nurses attended traditional presentations or an eInservice arm where nurses accessed an electronic in-service online. Both types of in-services reviewed insulin regimens and the treatment of hypoglycemia in the hospital setting. Pre- and post-tests were administered to evaluate knowledge retention and surveys were used to assess learner satisfaction.

Results: An eInservice was developed and implemented for the nursing staff. No significant differences between the two arms in terms of short-term knowledge retention or learner satisfaction were found.

Conclusion: Both the eInservice and the presentation were effective in delivering the content, and both media generated similar results in short-term knowledge retention and learner satisfaction.

Acute Coronary Syndromes Associated with the Use of Bupropion: Two Case Reports

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Bupropion is classified as a noradrenaline and dopamine reuptake inhibitor that is used to treat depression as well as a pharmacological aid for smoking cessation. Given its pharmacological mechanism of action, cardiovascular events may occur. We report 2 cases of acute coronary syndromes associated with the use of bupropion as a therapy for smoking cessation.

A 48-year-old female with a history of angina, hypertension, dyslipidemia and placement of a right coronary artery stent 23 days prior presented to hospital with complaints of chest discomfort becoming progressively worse over the day. An angiogram revealed a patent stent to rule out occlusion, creatinine kinase (CK) and troponin levels were normal and she was diagnosed with unstable angina and managed appropriately. The patient indicated that she had recently started bupropion for smoking cessation, with increase in dose 3 days prior to presentation.

The second case involved a 60-year-old male with a history of dyslipidemia, who complained of approximately 2 week history of intermittent chest pain which progressed to continuous, radiating pain over the past 24 hours. He had started bupropion 2 weeks prior for smoking cessation. His CK and troponin were elevated and peaked at 617 and 11.34 respectively and he was diagnosed with an anterior wall transmural non-STEMI.

Applying the Naranjo Probability Scale to both cases each resulted in a score of 5 suggesting a probable reaction. These cases demonstrate the necessity to use caution in prescribing bupropion in patients with underlying cardiovascular risk factors.

Tuesday, January 30 • Mardi 30 janvier

Nursing Opinion of the Medication Distribution System

Richard Cashin[1], Bill Wilson[2] PharmD Candidate, Leslie Dan Faculty of Pharmacy, Mt. Sinai Hospital, Toronto, ON

Mount Sinai Hospital (MSH) is a 472 bed teaching hospital with a main pharmacy and 2 satellites that service select units with a unit dose distribution service. Recently, proximity cupboards (PC) which house patient's medications and other tools required for patient care were constructed in patient rooms on select units. It was unknown how the addition of the PC has affected nursing opinion of the medication distribution system and a survey to be completed by nursing staff was developed and validated. After completion of the survey by nursing staff, comparisons were made between units with and without a PC. Ninety-six of 250 (38.4%) surveys were completed. No differences in nursing opinion were noted in the following areas: the storage of new orders written and

medications dispensed, the physical product supplied by pharmacy, and the exchange time of medications. However, 56% of nurses on units with a PC believed that PCs decrease the amount of time spent finding patient medications and only 31% of nurses in those areas agreed that they spent too much time looking for patient medications. Conversely, on units without a PC or a satellite pharmacy, 63% of nurses agreed that they spent too much time looking for patient medications. Overall, the current drug distribution system at MSH is well received by nursing staff and PC should be considered for all units as they may be associated with a time savings for nursing staff.

Capital Health Pharmacy Department Professional Development Program

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Purpose: To offer staff pharmacists the opportunity to participate in clinical or administrative rotations outside their current areas of practice.

Objectives:

- To invest in personal and professional development of staff pharmacists
- To increase job satisfaction
- To promote staff retention
- To create interest in different areas of practice within the pharmacy department
- To promote succession planning

Description of Program: From June 2003 to May 2006, staff pharmacists were encouraged to apply for two-to-four week drug information, clinical or administration rotations of their choice, in 14 different practice areas. Pharmacists accepted in the program were relieved of job responsibilities to allow dedicated education time for the duration of the rotation. They were paired with another pharmacist specializing in the chosen area who acted as a preceptor. These rotations were scheduled around operational requirements.

End Results and Evaluation: Six pharmacists completed 7 rotations in drug information and various clinical areas. Their evaluations are summarized below.

Rating scale: (1 strongly disagree, 2 disagree, 3 agree, 4 strongly agree)

	Average
I met my personal goals/objectives by completing this rotation	3.2
I met my professional goals/objectives by completing this rotation	3.2
I expanded my clinical skills	3.8
I expanded my clinical and/or therapeutic knowledge base	3.8
Completing this rotation has created an interest for me to practice in an alternate area than I currently practice	2.8
This rotation was a worthwhile professional development opportunity	3.8
The opportunity to participate in this program added to my job satisfaction as a Capital Health employee	3.8

Importance and Usefulness of the Program for Pharmacists: The program increased job satisfaction by allowing pharmacists to acquire new knowledge, develop new skills and achieve personal and professional goals. The program was conducted without any departmental financial investment since it utilized existing human resources within the department.

Development of an Electronic Database Program to Assess Side Effects in Patients Receiving Capecitabine Chemotherapy

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Rationale: Orally administered antineoplastics, pose unique challenges for healthcare professionals. Patient self-administration of agents such as capecitabine, require closer monitoring for side effects, compliance and possible drug interactions. Close monitoring of patients receiving capecitabine for signs and symptoms of side effects with early dose modification has been shown to reduce the incidence of serious side effects in clinical trials. Strategies to manage side effects can also be discussed during a scheduled inteview with the patient, lessening the impact of the side effects on the patient's quality of life and allowing for continued therapy. Close follow-up of patients may also encourage compliance. The challenge for the healthcare professional in this setting is the ongoing documentation of the patient's experience within and between cycles.

Description: Report on the development and implementation process of a real time electronic data capture program to document the occurrence, severity and management of side effects experienced by patients receiving capecitabine.

Methods: Patient characteristics, including demographics, diagnosis and regimen were identified. The NCI Common Toxicity Criteria v3.0 was modified for use in side effect grading. Literature was reviewed to identify management strategies for nausea, vomiting, diarrhea, PPE, mucositis and neutropenia. A capecitabine dose modification schedule was integrated into the side effect management strategies. Program elements and functionality were identified and discussed with program developers using an iterative. This process allowed for ongoing program assessment and modification ensuring desired functionality.

Results: The program captures patient symptoms, assigns toxicity grade, records side effect treatment strategies and schedules appropriate follow-up. The program is Internet based and can be accessed using wireless technology to allow for greater flexibility of use. The program will be evaluated for functionality, usability and acceptance. Computer technology can facilitate the prevention and management of chemotherapy related side effects and broaden the scope of Oncology Pharmacy Practice

Evaluation of an Intravenous Erythropoietic Hormone Replacement Therapy Dosing Algorithm for the Treatment of Anemia in Hemodialysis Patients

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Background: The treatment of anemia and erythropoietic hormone replacement therapy (EHRT) dose titration at St. Paul's Hospital was managed by nephrologists. Variation in hemoglobin

levels were recognized and believed to be a result of inconsistencies in dose titration.

Objectives: To evaluate the efficacy of an EHRT dosing algorithm in achieving and maintaining hemoglobin levels within the desired target range; and to compare the average dose of erythropoietin and darbepoetin used during the periods before and after algorithm implementation.

Methods: Data were collected for two different periods: a six month retrospective chart review of the individualized dosing by nephrologists and a six month prospective evaluation of the algorithm dosing by pharmacists.

Results: The percentage of hemoglobin levels within the desired target range was not statistically significant (p=0.42) between the two groups: 50.7% for the individualized dosing period versus 49.6% for the algorithm dosing period. The average erythropoietin and darbepoetin dose between the two periods was 10,773 units versus 11,551 units of erythropoietin (p=0.447) and 31.7 mcg versus 26.5 mcg of darbepoetin (p=0.495) for the individualized dosing and algorithm dosing periods, respectively.

Conclusion: There was insufficient evidence to suggest any difference in efficacy between the individualized dosing by nephrologists and the algorithm dosing by pharmacists.

Physicians' Changing Perceptions of Contributions to Medication Use Processes as Pharmacists Integrated into Family Practice

Barbara Farrell[1,2,3], Kirsten Woodend[2], Kevin Pottie[1,2,] Vivian Yao[1,2], Lisa Dolovich[4], Natalie Kennie[5], Connie Sellors[4], on behalf of the IMPACT investigators Élisabeth Bruyère Research Institute, CT Lamont Centre, Ottawa, ON

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Rationale: Successful integration of a pharmacist into family practice requires development of a shared understanding of expertise and roles. This study measured physicians' perceptions about their own and pharmacists' contributions to medication use processes (MUP) in family practice and how these changed over time.

Objectives: The objective of this study was to measure how physicians perceived their own and pharmacists' contributions to MUP over time as 7 pharmacists integrated into 7 family practice clinics in the Ontario IMPACT (Integrating family Medicine and Pharmacy to Advance primary Care Therapeutics) project.

Study Design and Methods: The 22-item Family Medication Use Processes Matrix (MUPM) with 5 subscales (diagnosis & prescribing, monitoring, administrative & documentation, education and medication review) was mailed to physicians in the 7 sites at the 3rd, 12th and 19th month of pharmacist integration. Paired sample T-tests were conducted to compare perceptions at the 3rd month. One way repeated measure ANOVA test was conducted to determine significant changes over time in each subscale.

Results: Response rates were 75%, 77% and 75% for the three survey administration times. Physicians initially perceived their contribution to be significantly higher (p<.05) than that of pharmacists in 3 subscales (Diagnosis & Prescribing, Monitoring and Admin/Documentation) and lower (p<.05) than that of pharmacists in 1 subscale (Education). Over time, they perceived their own contribution to be decreasing in the Diagnosis & Prescribing and Education subscales (p<.05), and the pharmacists' contribution to be increasing in the Diagnosis & Prescribing, Monitoring and Medication Review subscales (p<.05).

Conclusion: The MUPM identifies differences in how physicians view their own and pharmacists' contributions to medication processes in primary care. Changing perceptions suggest exploration of roles, change in understanding of their own and each others roles. Physicians' increased recognition of pharmacist contribution suggests increased value placed on integrated pharmacists' clinical competency and expertise.

Examining Physicians' Perspectives during the Integration of a Pharmacist into Family Practice

Barbara Farrell[1,2,3], Kevin Pottie[1,2], Susan Haydt[1,2], Lisa Dolovich[4], Natalie Kennie[5], Connie Sellors4, and William Hogg[1,2] on behalf of IMPACT investigators. Élisabeth Bruyère Research Institute, CT Lamont Centre, Ottawa, ON, University of Ottawa, Ottawa, ON, SCO Health Service, Ottawa, ON, Centre for Evaluation of Medicines and McMaster University, Hamilton, ON, St. Michael's Hospital, University of Toronto, Toronto, ON

Rationale: Physicians may have concerns about medical-legal issues, scope of practice, continuity of care, workload and satisfaction as other health disciplines integrate into primary care. This study involved a qualitative evaluation of physicians' perspectives as 7 pharmacists integrated into 7 physician-led family practices in the Ontario IMPACT (Integrating family Medicine and Pharmacy to Advance primary Care Therapeutics) project. Pharmacists provided medication assessments, drug information, academic detailing and developed office system enhancements to optimize drug therapy.

Objective: What are the perspectives of family physicians (e.g. challenges, barriers, successes) 12 months into the process of integrating a pharmacist?

Study Design and Methods: Qualitative design using key informant interviews (N=14) at the 12th month of the integration process. A diverse sample of participating family physicians was purposively selected based on age, sex, and degree of support, over-sampling physicians felt by integrating pharmacists to be unsupportive. Interviews were 20 minutes, audiotaped and transcribed. Four researchers with varied backgrounds used immersion and crystallization to identify codes, and iterative grounded theory to determine key process and content themes.

Results: Challenges included finding time to make contact and learn about the pharmacist's role and skills. Insufficient space was seen as the main structural challenge. Facilitating factors in the development of the inter-professional relationships were mutual respect of time, practical skills and boundaries. Appreciations included having a colleague to provide current, reliable drug information, fresh perspectives, time saving measures, and feeling increased confidence in prescribing. Practice-level benefits included group education, medication-related protocols and liaison with community pharmacy and pharmaceutical representatives. Physicians' initial concerns (e.g. medical legal implications, loss of continuity of care, and scope of practice) decreased markedly as they began to understand and appreciate the role of the pharmacist.

Conclusions: Physicians found the integration process both challenging and rewarding. Initial concerns abated with time and experience.

Characteristics of Ganciclovir Resistant Cytomegalovirus in Solid Organ Transplant Recipients

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Rationale: Cytomegalovirus (CMV) is associated with significant morbidity and mortality in solid organ transplant recipients (SOTR). The antiviral of choice for treatment and prevention of CMV is ganciclovir. Preventative strategies include universal prophylaxis, targeted prophylaxis, or preemptive therapy.

Ganciclovir is activated via 3 sequential phosphorylation steps. It exerts its effect by inhibiting CMV-DNA polymerase, thereby inhibiting viral proliferation. Valganciclovir, an oral prodrug of ganciclovir, has enabled simpler, less invasive preventative strategies to become adopted.

With greater exposure to ganciclovir/valganciclovir, the emergence of ganciclovir resistant CMV (GanR-CMV) has become apparent. Resistance may develop as a result of mutations to UL97, which affects phosphorylation; or UL54, which codes for CMV-DNA polymerase.

GanR-CMV is associated with poor clinical outcomes; requiring costly, toxic drugs including cidofovir or foscarnet.

Objectives: To identify characteristics of GanR-CMV in SOTR.

Design: A retrospective audit was conducted for cidofovir or foscarnet usage between 08/2004-09/2006. The Organ Transplant Tracking Record database and pharmacist-maintained profiles were used to identify characteristics.

GanR-CMV was suspected if patients failed to respond to full-dose intravenous ganciclovir. Following Transplant ID consult, treatment was initiated with cidofovir, foscarnet, or combination therapy with ganciclovir.

All CMV D+R- SOTR received ganciclovir/valganciclovir prophylaxis for 3 months following transplantation. Other patient groups were risk-stratified according to CMV Prevention Guidelines.

Results: Three SOTR received either cidofovir or foscarnet for clinically suspected GanR-CMV.

No patients were tested for UL97 or UL54 mutations at the time of initiation of therapy (see table below).

Conclusion: Amongst non-lung SOTR, published reports have identified GanR-CMV in D+R- patients only. In this cohort, GanR-CMV was clinically suspected in D+R+ liver transplants. CMV resistance testing is required to confirm this finding.

Nephrotoxicity and Ototoxicity with Inhaled Tobramycin

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Tobramycin has activity against gram-negative bacteria including pseudomonas aeruginosa. Its use is limited by the potential for nephrotoxicity and ototoxicity. For pseudomonas pneumonia in lung transplant recipients (LTR), inhaled tobramycin (TobraINH) is used adjunctively to improve lung tissue penetration and to minimize systemic toxicity. The safety of TobraINH has not been established in LTR. We report a case of nephrotoxicty and ototoxicity associated with the use of TobraINH in a LTR.

A 67 year old male non-cystic fibrosis LTR was admitted with fever, rigors, chills, and rapid respiratory deterioration. Pseudomonas pneumonia was diagnosed based on chest radiograph and blood cultures.

Following ID consult, piperacillin/tazobactam and ciprofloxacin were initiated. After failing to improve, antibiotics were changed to meropenem, ciprofloxacin and TobraINH 160 mg BID. Various anti-pseudomonal combinations were then used until the patient improved. He was eventually discharged after 60 days on ceftazidime and TobraINH.

Three weeks later, he was readmitted with progressive deterioration, SOB, fatigue, crackles, and a SCr of 267umol/L (baseline: 130-160umol/L). He also complained of new-onset bilateral hearing loss.

His antibiotics were changed from ceftazidime and TobraINH to meropenem and ciprofloxacin. After gradual improvement he was discharged with a SCr of 156umol/L. He still, however, complained of hearing loss.

In total, the patient received 58 days of TobraINH therapy. No tobramycin serum levels were drawn. Exposure to other concomitant nephrotoxic drugs was minimal (calcineurin-inhibitors were avoided).

TobraINH has been shown to be safe in cystic fibrosis patients. This population is unique because of altered sputum and pharmacokinetic characteristics. In LTR, the only other case report of systemic toxicity was in a non-cystic fibrosis patient receiving a higher dose (300 mg BID).

TobraINH should be used cautiously in non-cystic fibrosis LTR. Monitoring of serum tobramycin levels should be considered to assess for systemic absorption.

Transplant	CMV Serostatus	Onset of CMV Post Transplant (days)	Clinical Presentation	Duration of Gan/ Valganciclovir Prior to Presentation (days)	Treatment Regimen	Outcome
Liver	D+R+	167	Fever, gastritis, hepatitis	102	Ganciclovir	Deceased
Liver	D+R+	56	Fever, diarrhea, confusion	0	Ganciclovir + Foscarnet	Survived
Lung	D+R-	150	Fever, fatigue	89	Forcarnet + CMV Hyperimmune Globulin	Deceased
D = Donor CMV IgG; R = Recipient CMV IgG ; + indicates previous exposure to CMV						

Evaluating the Contribution of a Preprinted Order, Multidisciplinary Collaboration and Staff Education in the Utilization of Drotrecogin Alpha Activated (Drotrecogin) in a Community Hospital Intensive Care Unit (ICU) Setting

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Purpose: Drotrecogin is the first agent that has been proven to reduce mortality in severe sepsis. Given the detailed criteria and cost implications associated with this therapy, an accountability mechanism was created to ensure appropriate utilization at our institution.

A preprinted order with evidence based criteria was developed in conjunction with a staff education program and ongoing multidisciplinary collaboration (described in detail elsewhere).

Objectives: The primary objective was to evaluate utilization of drotrecogin based on criteria on our preprinted order, educational initiatives and ongoing multidisciplinary collaboration. The secondary objective was to describe safety and efficacy outcomes in patients treated with drotrecogin.

Methods: A retrospective drug use evaluation was completed on all patients receiving drotrecogin between December 2004 and September 2006. Patients were identified through the pharmacy and decision support departments. Charts were reviewed by a pharmacist using an audit tool.

Criteria evaluated included compliance with preprinted orders, eligibility status, appropriate dose, duration, 28 day survival and bleeding rates.

Results: From December 2004 to September 2006, drotrecogin was administered to 20 patients. One patient was not included in the review as the chart was not accessible. Proportions were used to describe the results presented below for the 19 patients evaluated.

Table 1: Drotrecogin Drug Use Evaluation Results (n=19)

Criteria	Total (%)
Preprinted Order Utilized and Completed	18 (94.7%)
Eligibility for Treatment	18 (94.7%)
Correct Dose	19 (100%)
Correct Duration	10 (52.6%)
Mortality Data Met 28 day survival Did not meet 28 day survival Unknown	 11 (57.9%) 6 (31.6%) 2 (10.5%)
Bleeding Events	2 (10.5%)

Conclusions: This review supports that preprinted orders, education and multidisciplinary collaboration facilitated appropriate utilization of drotrecogin in our setting. Sharing our experience may benefit others searching for an approach to optimal use of drotecogin in a community hospital.

Development and Implementation of an Admission Medication Reconciliation Education and Certification Program for Pharmacists

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Rationale: Pharmacists can play a key role in implementing medication reconciliation solutions that improve patient safety. Strategies are required that provide pharmacists with the appropriate knowledge and skills to meet the new medication reconciliation hospital accreditation standards. The purpose of this study was to develop and pilot a structured admission medication reconciliation education and certification program for hospital pharmacists.

Description: Participants were asked to complete a pre-reading package (Medication Reconciliation Getting Started Kit) and attend two 1 hour sessions that introduced participants to medication reconciliation, completing a best possible medication history (BPMH), and identifying and coding discrepancies. Following the sessions, 5 pharmacists completed a BPMH on a standardized patient and identified discrepancies. They were scored and given feedback on process and accuracy. Data from this component and existing tools from other institutions was used to develop a BPMH trigger worksheet which pharmacists were encouraged to use. In the certification phase, pharmacists (n=14) interviewed a standardized patient (case with 10 discrepancies / 20 medications) and were scored on :1) BPMH process accuracy; 2) accuracy in identifying admission discrepancies; and 3) ability to code discrepancies.

Evaluation: In the certification phase, mean BPMH score was 80.6% [range 57.1-100.0 %]. The 9 of 14 pharmacists that chose to use the BPMH trigger work sheet had a higher score than those that did not (88.1 vs. 67.1%). Mean time to complete the BPMH was 14.6 minutes [range 9-25]. The discrepancy identification and coding accuracy scores were 97.5 % [range 85.0-100.0 %] and 97.1 % [range 80.0-100.0 %] respectively.

Importance: A medication reconciliation certification process is a useful tool in supporting pharmacists to gain the needed skills and knowledge to perform medication reconciliation. A BPMH trigger worksheet may assist pharmacists with BPMH accuracy. Future investigations can explore adaptation of this process to nurses and physicians.

Medication Incident Reporting: Is it the Means to an End?

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Rationale: Analysis of medication incidents provides insight about system failures. Anecdotal reports indicate that medication incidents are under-reported at Lions Gate Hospital (LGH), a 290 bed tertiary care community hospital.

Objective: To increase reporting rates by demonstrating to staff that reported incidents are used to directly improve safety of the medication use process.

Methods: In 2003, the Pharmacy and Nursing Committee initiated a campaign aimed at improving incident reporting rates. Information was collected about the type of incident and the contributing factors as noted on the Health Care Incident Reporting

System (HIRS) form, the standard incident reporting tool at LGH. Each quarter, data were summarized as a standardized frequency i.e. as a proportion of newly entered medication orders for that time period. These quarterly normalized reporting rates were examined to identify the types of incidents which were higher than usual (one standard deviation greater than the average for previous year). Categories of incidents reported above normal rates were reviewed through a team-conducted audit of the patients' charts to identify system flaws that may have contributed to the incident. Recommendations for system improvements were shared with frontline staff, and team leaders were asked to foster a culture of safety and to encourage staff to report medication incidents.

Results: The frequency of reporting in 2002, the year prior to campaign, was 152 medication incident reports per 100,000 new orders, a 30 percent decline from the previous year. In 2003, 2004 and in 2005 the frequency of incident reporting per 100,000 new orders was 140 (- 8 %), 170 (+22 %) and 174 (+2 %) respectively.

Conclusion: Analysis of medication incident reports in order to give staff feedback about system improvements may play a role in promoting a culture of safety as demonstrated by the reversal of declining incident reporting rates.

Wednesday, January 31 • Mercredi 31 janvier

Fostering Curiosity and Promoting Research in a Clinical Setting: The Creation of Research Capacity

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Purpose of Educational Activity: The Research Workshop Series was created to introduce Fraser Health (FH) staff to the basic steps in conducting research. The workshop series is the first phase in a long-term initiative to develop research capacity in FH.

Objectives: The goal was to provide all FH health care professionals with knowledge on research methods, statistics, and literature search skills in order to foster the development and use of research in everyday practice.

Description of Educational Program: The 8 session workshop series included three components: Framework for Research and Guidelines for Process, Introduction to Statistics and Quantitative Research Methods, and Literature Search Skills. Participants were provided with resource materials, including effect measures and common analytic and experimental designs. Workshops combined lectures with hands-on learning activities. An evaluation form based on a 5 point Likert-type satisfaction scale was provided to all participants to measure various aspects of the program. An online survey was also disseminated to obtain an estimate of workshop participants who utilize research in their professional practice and to examine how the dissemination of information in the workshop could be transferred to practice.

End Result and Evaluation: Participants were representative of the clinical and professional services, with a high representation of nursing and allied health professionals. Approximately 150 participants attended the workshops. Satisfaction surveys were returned by approximately 80% of the attendees. Fifty-six percent of participants completed the online survey. Results indicated a high level of satisfaction, an increased level of confidence with course content, and great likelihood to draw upon research in everyday work.

Importance and Usefulness: The results of satisfaction evaluations indicated that this initial phase for building research and research use capacity was both valued and successful. The workshop series has created excitement and interest in research among FH employees.

This innovative workshop series has provided a foundation for promoting evidence-based practice, the strengthening of research infrastructure, and knowledge transfer.

Palliative Care Drug Fact Sheets: An Educational and Safety Initiative to Support Nurses and On-Call Physicians

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Concerns regarding drug selection and dosing regimens arose among on-call physicians due to unfamiliarity with Palliative Care Unit (PCU) practices and lack of ready access to specific drug information. This led to drug-related problems such as delays in initiation of therapy, lack of drug therapy, and inappropriate dosing, with negative implications for patient safety.

A series of drug fact sheets were created to facilitate after-hours prescribing and optimize patient care. Each fact sheet included therapeutic indications and dosing recommendations outlining common prescribing practices in our PCU.

The PCU pharmacist, in conjunction with the medical director and nursing staff agreed upon a list of commonly used drugs that required a fact sheet and a template to be used in their development. Pharmacy research students created twenty-three drug fact sheets using references such as CPS, USP DI, Micromdex", and individual package inserts. Monographs developed by the students were reviewed to ensure that the information reflected PCU practices and complied with hospital medication policies. The completed drug fact sheets were placed in a binder on the PCU, distributed to specific on-call physicians, and posted on the hospital's Intranet web site.

Stakeholders were surveyed to seek feedback regarding satisfaction with content, layout, usefulness to practice, educational value and any comments. All respondents rated overall satisfaction with the fact sheets as excellent (5/5). Comments included "wonderful, much needed", "excellent reference for the entire team", "well laid out with key pertinent information", "good synopsis of relevant information".

This important pharmacy initiative has succeeded in providing drug education to staff and promoting patient safety by facilitating after hours prescribing through improved communication among health care providers. This valuable resource has been made available to all health care providers in the hospital via the Intranet.

Efficacy of a Point-of-Care INR Device Compared to Laboratory Testing In Patients Starting on a Warfarin Nomogram

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Rationale: Regular measurement of the INR by an accredited laboratory using a venous blood sample is considered an integral part of safe and effective warfarin therapy. We sought to compare INR results obtained using a capillary blood sample from a point-of-care (POC) device to those obtained from a venous sample by an accredited hospital laboratory.

Objectives: The primary objective was to compare INR test results obtained from a POC device to those from the hospital laboratory at the beginning of warfarin therapy. The secondary objective was to assess the effect of any difference in these results on the warfarin dose chosen.

Study Design and Methods: We conducted a single-center, prospective, cohort study using 29 patients presenting to an outpatient clinic with a new diagnosis of venous thromboembolism. On day 1 all patients began treatment with a low molecular weight heparin and warfarin. Duplicate INR testing was performed on days 3 and 5 of warfarin therapy. The INR values from the POC device and the laboratory were compared using linear regression and a paired t-test ($p \leq 0.05$ considered significant). In addition a Bland-Altman style bias plot was used to visualise differences between the two testing methods. Dosing decisions when using these results in a published nomogram were compared.

Results: The mean INR (SD) on day 3 was 1.48 (0.51) and 1.46 (0.38) from the POC device and laboratory respectively (p=0.65). The mean INR (SD) on day 5 was 2.86 (1.25) and 2.3 (0.58)(p=0.001). The regression coefficient was 0.87. The same warfarin dose would have been given 62.0% (CI 44-79) and 53.6% (CI 35-71) of the time on days 3 and 5 respectively based on the nomogram.

Conclusion: There was a strong overall agreement between the INR measured using the POC device and laboratory. The INR measured on the POC device was significantly higher on day 5 of warfarin therapy. There was a trend towards less agreement in dosing decisions on day 5.

Canadian Cost-Effectiveness Analysis of Bortezomib in Relapsed or Refractory Multiple Myeloma Patients

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Rationale: Multiple myeloma (MM) is an incurable cancer with poor survival. Clinical trials show single agent IV bortezomib produces significantly better response rates, longer time to progression and overall survival in relapsed/refractory MM patients than conventional therapies such as high dose dexamethasone (HDD). With the clinical benefit of bortezomib confirmed, assessing the economic value of bortezomib is warranted.

Objective: The objective is to determine the cost-effectiveness of bortezomib in the relapsed/refractory MM patient based on the APEX study and on current care in Canada. The comparator from the APEX study (Richardson, NEJM 2005) is HDD and the other agent commonly used, based on current treatment patterns, is thalidomide monotherapy or combination therapy with steroids (thalidomide regimens).

Study Design & Methods: A Markov model was developed to simulate the survival of patients on bortezomib, HDD and thalidomide regimens over a 10-year period. One to 3-year survival was derived from the APEX study for bortezomib and HDD, and from published literature for thalidomide regimens. Published epidemiological data from the Mayo Clinic was used to extrapolate survival to 10 years. Cost (2006 Canadian dollars) for resource use included acquisition drug cost, pharmacy preparation cost for IV drugs and cost for managing key adverse events. Heath utility scores from APEX study were used to convert survival life-years to quality-adjusted life-years (QALY).

Results: Survival was lowest for HDD and highest for bortezomib. The incremental cost-effective ratios (ICER) derived of $48,850 or $34,200 per QALY are within the acceptable range.

Comparison	Incremental life-years (LY)	Incremental QALY	Incremental Cost	Incremental Cost per LY	Incremental Cost per QALY
Bortezomib vs. HDD	0.86	0.62	$30.432	$35,514	$48,850
Bortezomib vs. thalidomide regimens	0.37	0.27	$9,228	$24,863	$34,200

Conclusion: Bortezomib provides relapsed/refractory MM patients with a substantial increase in survival. The resulting ICERs of bortezomib indicate it is a cost-effective option.

Impact of an Institutional Order Form on Improving Antimicrobial Use

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Rationale: Inappropriate antimicrobial use has been linked to poor patient outcomes, the emergence of resistant organisms, and increased costs. A preprinted antimicrobial order form (AOF) with defined criteria was implemented April 2006 to improve prescribing for selected antimicrobials.

Objectives: To determine if compliance with antimicrobial restrictions changed from May – July 2005 (pre-intervention) to May – July 2006 (post-intervention).

Methods: A random sample of patients was reviewed retrospectively for ceftriaxone (40 patients) and ciprofloxacin (84 patients). Patient demographics, lab values, cultures, antimicrobial regimen and indication were collected. Antimicrobial appropriateness was independently assessed by 3 reviewers. Differences were analyzed using Fisher's exact test.

Results: Ceftriaxone patients (mean age 61.0 years) were treated for nosocomial pneumonia (37.5%), intra-abdominal infections (22.5%), serious gram negative infections (12.5%) and community-acquired pneumonia previously treated with quinolones (12.5%).

Appropriate use increased from 75% in 2005 to 80% in 2006 (p=1.00).

Ciprofloxacin patients (mean age 62.9 years) were treated for intra-abdominal infections (21.4%), resistant gram negative infections (16.7%) and resistant urinary tract infections (11.9%). Ciprofloxacin was frequently prescribed outside approved criteria for prophylaxis after surgery (19.0%) and empiric treatment of urinary tract infections (16.7%). Appropriate use increased from 17% in 2005 to 52% in 2006 (p=0.0011). Appropriate use for both drugs improved from 35% to 61% (p=0.0068).

Conclusion: Appropriate use of 2 broad spectrum antimicrobials significantly improved after the introduction of a preprinted order form, in a small sample of randomly selected patients. Future work will examine the appropriate use of other restricted antimicrobials.

Teaching Teaching Skills: The Development and Assessment of an Educational Program for Pharmacy Residents and Staff Pharmacists

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Background: The Canadian Hospital Pharmacy Residency Board accreditation standards and a position paper by the Executive of the Hospital Pharmacy Residency Forum of Ontario both point to the need for pharmacy residents to develop teaching skills. A survey of Canadian residency graduates clearly indicates the desire of pharmacy residents to develop teaching skills. A recent study also suggests that many residents become involved in clinical teaching very soon after completing their residency program. Many practicing pharmacists also become involved in clinical teaching, often with little prior training for these roles.

Objectives: To develop a succinct educational program to help participants acquire knowledge necessary for clinical teaching and to evaluate the perceived value of the program through participant self-assessment and feedback.

Methods: Results of a needs assessment questionnaire identified 5 core topics to be covered in the 4 one-hour sessions. These 5 topics included: principles of adult learning theory, setting goals and learning objectives, questioning techniques, providing feedback and assessment and "microskills" of teaching. Outcome based learning objectives were developed for each topic and provided the basis for creating pre-reading materials, practice exercises and PowerPoint slides. The instructional plan applied principles of adult learning theory. Practice exercises were an integral part of all sessions providing participants with the opportunity to apply the concepts being taught. The workshop was evaluated by anonymous post-session surveys.

Results: After completing sessions, participants perceived significant improvements in their knowledge and/ or ability for most aspects assessed. Most felt the information covered would help them to perform different teaching skill sets. Participants liked the interactive format and the opportunity to apply the material taught through practice exercises.

Conclusion: The results of this study suggest that involvement in this teaching skills workshop will help to prepare residents and practicing pharmacists for their roles as clinical teachers.

Visual Hallucinations Associated with Voriconazole – A Case Report

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Voriconazole is a broad-spectrum antifungal agent used in invasive aspergillosis and in patients with neutropenia and persistent fever. It is well tolerated with the most commonly described effects being transient visual disturbances, headaches, hepatic abnormalities and skin reactions. We report a case of visual hallucinations associated with voriconazole therapy.

A 67-year-old man with newly diagnosed acute myeloblastic leukemia was admitted for induction chemotherapy. Medications were started for complications that developed (gram positive sepsis and non-occlusive thrombus) and for fungal and viral prophylaxis. On hospital day 14, the patient developed an intermittent cough, with crackles and decreased air entry into the left lower lobe. CT of the thorax showed opacities with ground-glass haloes suggestive of aspergillus pneumonia. Voriconazole 400mg q12h x 2 doses then 200mg q12h was started on day 15. On hospital day 16, the patient began experiencing visual hallucinations and increasing confusion which continued overnight and throughout the next day. The patient had no previous history of psychiatric illness. CT of the head was performed to rule out infection, intracranial bleed or leukemic menininge al involvement. Voriconazole was held on day 18 and therapy changed to liposomal amphotericin B. No drug therapy was employed for hallucinations, and no other medication changes made. By day 19, the patient was more alert and coherent, and the hallucinations had completely resolved with a return to normal functioning.

The hallucinations were felt to be due to voriconazole despite the chemotherapy and several medications having neurotoxic potential, as the patient appeared to tolerate all agents prior to voriconazole well, with no sequelae. There have been 2 previous case reports of voriconazole-induced hallucinations. A Naranjo ADR probability scale of 6 suggests a probable adverse drug reaction. .

This case illustrates the potential for voriconazole to induce hallucinations and the importance of recognizing this potential when monitoring patients started on voriconazole.

Expanding Beyond the Hospital – Developing Pharmacist Services in a Regional Geriatric Program

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Rationale: Frail seniors have complex medication related needs. They are at high risk of adverse drug events and related morbidity. Regional Geriatric Programs (RGP) in Ontario are designed to provide comprehensive services to this vulnerable group in various settings. The addition of a pharmacist to the program aims to promote the role pharmacists have in optimizing medication use, build inter-professional capacity, and to expand practice beyond the traditional institutional setting,

Description: A pharmacist role was created with the Southwestern Ontario RGP in March 2006. The pharmacist became active as a regional resource to the 10 counties within the network by May 2006. A medication-related consultation service was developed and offered to the region. Several educational and capacity building initiatives led by the pharmacist have been completed.

Implementation: Challenges faced included limited resources in servicing a large geographical area and team members' lack of awareness of the pharmacist's role. To overcome these, a flexible

schedule was set up. Detailed orientation plus a series of regional visits with local teams were held. The pharmacist attended case conferencing with teams and had numerous opportunities to provide education regarding pharmacist services. Referral and educational tools were used to promote the identification of drug-related issues.

Result: A total of 24 consults were received between May to Sept 2006, from 5 counties. The rate is steadily increasing from an initial 2 per month to 12 within the last month. The type of consultation also became more complex, from single-drug questions to comprehensive regimen assessment and full medication reviews. Pharmacist time within the program has grown from 1 day per week to up to 3-4 days / week.

Impact for Practice: A novel role for the pharmacist as well as the geriatric assessment teams, its successful uptake demonstrates there is tremendous need for medication use support both in this patient group and in the inter-professional team. Hospital pharmacists are ideally situated to provide this support with clinical experience and institutional resources, and should explore such opportunities to carry patient care beyond discharge.

Adequacy of Antidote Stocking in British Columbia Hospitals: The 2005 Antidote Stocking Study

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Background: Inadequate hospital stocking and the unavailability of essential antidotes is a worldwide problem with potentially disastrous repercussions for poisoned patients. Research indicates minimal progress has been made in the resolution of this issue in both urban and rural hospitals. In response to this issue the British Columbia Drug and Poison Information Centre (BC DPIC) developed provincial antidote stocking guidelines in 2003. We sought to determine the compliance with antidote stocking in BC hospitals and any factors associated with inadequate supply.

Methods: A two-part survey, consisting of hospital demographics and antidote stocking information, was distributed in 2005 to all acute care hospital pharmacy directors in BC. The 32 antidotes examined (21 deemed essential) and the definitions of adequacy were based on the 2003 BC guidelines. Availability was reported as number of antidotes stocked per hospital and proportion of hospitals stocking each antidote. For secondary purposes, we assessed factors potentially associated with inadequate stocking.

Results: Surveys were completed for all 79 (100%) hospitals. A mean of 15.6 ± 4.9 antidotes were adequately stocked per hospital. Over 90% of hospitals had adequate stocks of N-acetylcysteine, activated charcoal, naloxone, calcium salts, flumazenil, and vitamin K; 71-90% had adequate dextrose 50%, ethyl alcohol or fomepizole, PEG solution, protamine sulfate, and cyanide antidotes; 51-70% had adequate folic acid, glucagon, methylene blue, atropine, pralidoxime, leucovorin, pyridoxine, and deferoxamine; and <50% had adequate isoproterenol and digoxin immune Fab. Only 7 (8.9%) hospitals sufficiently stocked all 21 essential antidotes. Factors predicting poor stocking included small hospital size ($p<0.0001$), isolation ($p=0.01$) and rural location ($p<0.0001$).

Conclusion: Although antidote stocking has improved since the implementation of the 2003 guidelines, essential antidotes are absent in many BC hospitals. Future research should focus on determining the reasons for this situation and the effects of corrective interventions.

Impact of a Pain Management Practice Guideline on Narcotic Administration in Emergency Department Patients Undergoing Trauma Team Activation

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Introduction: Numerous studies have found suboptimal analgesic use in emergency department (ED) patients. We sought to determine the impact of a pain management practice guideline (PG) for major trauma patients at a tertiary hospital. Our primary hypothesis was that the PG would result in at least a 30% relative reduction in the median time to analgesic administration (a difference deemed a priori to be clinically significant).

Methods: An interdisciplinary team developed and disseminated a pain management PG that categorized trauma patients into three groups based on hemodynamic stability. Charts of all patients associated with a trauma team activation over a three-period time series were reviewed using explicit criteria: the 6 months immediately prior to and 6 months immediately after release of the PG (P#1 and P#2); and the 6 months commencing 18 months after release of the PG (P#3).

Results: 252 patients were enrolled between 2002 and 2004 (P#1 n=81, P#2 n=82, P#3 n=89). There was an increase in the proportion of patients receiving analgesics between P#1 and P#2, which was not sustained in P#3 (59.3%, 74.4%, and 51.7% respectively). The median (mean) time from arrival to an ED stretcher to first analgesic was 39.5 (76.6) minutes in P#1; 20.0 (47.5) minutes in P#2; and 25.5 (59.3) minutes in P#3 ($p=0.077$ by Kruskal-Wallis Test for overall downward trend). The reduction in the median time to first analgesic between P#1 and P#3 was 35.4% (absolute reduction 14 minutes). Use of fentanyl as the first drug, advocated by the PG over other agents due to its rapid onset, increased throughout the study periods (P#1: 37.5%, P#2: 50.8%, and P#3: 56.5%). A trend towards a decrease in the time interval between repeat drug doses across the study periods was also observed.

Conclusions: Implementation of a pain management PG for trauma patients at our institution resulted in sustained clinically significant improvements in analgesic administration that trended towards statistical significance.

Using Personal Digital Assistant-Based Electronic Forms to Facilitate Research Data Collection at the Point-of-Care

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Introduction: Data collection in research typically involves paper forms with manual entry into database software. Personal Digital Assistant (PDA) database development software can electronically replicate paper forms. Our objective was to develop an electronic data collection form (DCF) to facilitate practice-based research data collection with a PDA at the point-of-care.

Methods: Internet and medical databases were searched to identify available database development software for the Palm" Operating System (OS). Features of the identified software were evaluated according to OS compatibility, cost, development platform, field capacity, local area network (LAN) synchronization capability, data-sharing functionality, back-end data management, and security. Pendragon Forms" was chosen for its cost, non-technical development interface, and integration with Microsoft Access". Data collected on the PDA is transferred to a database program on a Personal Computer (PC) via a cable connection and execution of the PDA synchronization function. Multiple PDA users can also transmit and share data via LAN. The data can then be analyzed with PC-based software. Data on the PDA is secured with password access control and encryption.

Results: We developed electronic DCFs to facilitate data collection for several research initiatives. Data entry consists largely of drop down menus of structured responses. PDA-based data collection enabled us to characterize drug-related problems that pharmacists identify during routine care and to evaluate the workload of our Intravenous Resource Nurse Service. We also utilized this technology to study patients experiencing drug related hospitalizations at our institution and we have a protocol in place to investigate drug-related visits to our ED.

Your opinion matters!

CSHP continues to post the conference preliminary program and the registration form on the CSHP website for your convenience.

We are now asking if you would support CSHP in discontinuing the mailing of the preliminary program and registration form to your preferred mailing address?

Please visit the CSHP website at:
http://www.cshp.ca/events/cshpEvents_e.asp
to cast your vote.

Please note that this poll refers only to the preliminary program and registration form; **NOT** the final program.

CSHP New Fellows / Nouveaux Associés de la SCPH

CSHP Fellow status is conferred by the Board of Fellows upon CSHP members who have demonstrated noteworthy, sustained service and excellence in the practice of pharmacy in an organized healthcare setting.

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Kelly Babcock, B.S.P.

Kelly Babcock graduated with distinction in 1981 from the University of Saskatchewan with a Bachelor of Science in Pharmacy degree. He then completed a hospital pharmacy residency program at the Royal University Hospital in Saskatoon.

Kelly started his career in July 1982 as the Director of Pharmacy at the Melfort Union Hospital in Saskatchewan, where he transformed a total ward stock hospital into a computerized unit dose pharmacy complemented by an extensive clinical pharmacy service.

In 1987 Kelly moved to Ottawa to take the position of Pharmacy Manager at the Ottawa General Hospital. Two years later he became the Director of Pharmacy at the Queensway-Carleton Hospital. Over his nine years there, Kelly implemented a progressive pharmacy service using the pharmaceutical care model. He was also given additional management responsibility for other areas such as rehabilitation and ambulatory care.

In 1998 Kelly became the Director of Pharmacy at the SCO Health Service. In addition to implementing unit dose, CIVA, and a comprehensive pharmaceutical care service by the pharmacist team, Kelly became actively involved in research related to pharmacist interventions. Some of the studies included IMPACT, Working Together, and withdrawal of Baclofen and Dantrolene from complex continuing care patients. In April 2005 he also took over the Diagnostic Imaging and Specialized Services portfolios at the SCO Health Service.

Additionally, Kelly has acted as a pharmacy consultant for two hospitals, working to improve their services.

Kelly has been an active member of CSHP since 1982. This has included being the chair of numerous committees and task forces in the Saskatchewan and Ontario branches, and in national CSHP. He was a presidential officer in both the Saskatchewan and Ontario Branches and served as President of CSHP in 1998-1999. Kelly has won the Pharmacist of the Year Award in Saskatchewan, the Ontario Branch Award, and the Isabel E. Stauffer Meritorious Service Award.

In his time away from pharmacy, Kelly enjoys playing hockey and golf and looking after his three-acre yard with his wife Cindy in rural Ottawa.

Mark Collins, B.Sc.(Pharmacy), M.Sc.(Pharmacology), ACPR

Having obtained a Master of Science degree in Pharmacology at the University of Ottawa, Mark chose to pursue a career in pharmacy so that he could work more closely with patients. After completing a Bachelor of Science in Pharmacy at the University of British Columbia in 1985, he earned a residency in hospital pharmacy at St Paul's Hospital in Vancouver the following year.

During the intervening 20 years, first at St Paul's Hospital and now at Lions Gate Hospital, Mark's areas of interest have included drug information, drug use evaluation, pharmacy residency education, and medication safety. All the while he has been a strong advocate for improvements in patient-focused care.

Mark is a keen and active participant in the Canadian Society of Hospital Pharmacists. He has had a turn at all of the executive positions in the B.C. Branch and was the CSHP national representative on the National Licensing Standards Committee, National Association of Pharmacy Regulatory Authorities. In addition, Mark has served on several B.C. College of Pharmacist committees, including a five-year term as Chair of the Hospital Pharmacy Committee.

Mark strives for innovation in clinical pharmacy services, and this has been recognized by the B.C. Branch, CSHP with a Pharmacy Practice Award; and by national CSHP with a Management Issues in Pharmaceutical Care award. Pharmacists at LGH were among the earliest adopters of the personal digital assistant as a drug information reference and as a tool to measure indicators of quality in clinical pharmacy services. Mark has been the LGH Residency Coordinator and a preceptor for a number of award winning residency projects.

Currently Mark is the Assistant Manager of the Pharmacy Department at Lions Gate Hospital, where he coordinates the clinical, DUE and medication safety programs. He enjoys collaborating with the interdisciplinary team to promote clinical pharmacy services and medication safety. LGH was one of the first hospitals in B.C. to place a pharmacist in the surgical preadmission clinic to conduct medication reconciliation for elective orthopedic patients. The Pharmacy Nursing Committee, which Mark chairs, was recently invited by a national conference on patient safety to present a poster about strategies to improve medication incident reporting.

Mark is extremely grateful to his mentors, who have nurtured both his right and his left brain development, and to his family for their unwavering support.

Natalie Dayneka, B.Sc.Phm., Pharm.D.

Natalie Dayneka is a clinical specialist with the Department of Pharmacy, Children's Hospital of Eastern Ontario, in Ottawa. She obtained a B.Sc.Phm. and a Hospital Pharmacy Residency Certificate from the University of Toronto, and graduated with a Doctor of Pharmacy from the Philadelphia College of Pharmacy and Science. She holds an appointment in the Faculty of Pharmacy, University of Toronto.

Dr. Dayneka has been very active in several national and international professional associations. She has been elected to positions in the Canadian Society of Hospital Pharmacists at the local and provincial level. She has held appointed positions at the national level of CSHP, such as Chair of the National Awards Committee.

Natalie has served as a member of the Pharmacology and Therapeutics Committee for Medical Services Branch, Health Canada. She has also been a consultant for various federal advisory panels with Health Canada. Currently she is a consultant for the Drug Therapy and Hazardous Substances Committee and the Canadian Paediatric Society, and she is also the secretary for the Canadian HIV/AIDS Pharmacists Network.

Dr. Dayneka has focused her career on pediatric pharmacy while specializing in the areas of HIV/AIDS and infectious diseases. She has collaborated on pediatric international HIV publications. As a past recipient of the Pharmacy Practice Commitment to Care Award for Hospital Pharmacy, her dedication to pediatric HIV has been recognized.

Olavo A. Fernandes, B.Sc.Phm., ACPR, Pharm.D.

Dr. Olavo Fernandes graduated with a B.Sc. in pharmacy from the University of Toronto in 1998 and completed a hospital pharmacy residency at the University Health Network (formerly Toronto Hospital) in 1996. He then went on to obtain a Pharm.D. in 1998 at the University of Toronto.

After graduation, Olavo cared for critical care patients at the Toronto Western Hospital MSICU for three years while actively participating in teaching and research activities. In 2001 he assumed his current position as a Pharmacy Clinical Site Leader (Toronto General Hospital-UHN). In this position, he mentors and manages a team of inpatient and ambulatory care clinical pharmacists with various specialties. In his internal medicine teaching and practice site, Olavo has precepted pharmacy undergraduate and Pharm.D. students as well as pharmacy residents/interns. Olavo is passionate about residency training and has served as Pharmacy Residency Co-Coordinator for a number of years. He has actively mentored and precepted residents in MSICU and internal medicine clinical rotations as well a number of influential residency projects that have

contributed to advancing patient care, pharmacy practice, and medication safety.

In 2000 Olavo was appointed as an Assistant Professor with the Faculty of Pharmacy at the University of Toronto. He currently co-coordinates the undergraduate therapeutics courses with a focus on the small group case study seminars. He also enjoys teaching various clinical topics in a variety of other programs, including the Doctor of Pharmacy program and the International Pharmacy Graduate Program.

Olavo has been an active member of CSHP and other pharmacy associations, including holding a number of leadership positions. He currently serves as Chair of CSHP's Education Services Committee as well as the Hospital Pharmacy Residency Forum of Ontario. Olavo is also a national faculty member for the Medication Reconciliation-Safer Health Care Now! patient safety campaign. He has participated as an invited speaker on various topics at the local, provincial, and national levels. Olavo's contributions to the profession of pharmacy have been recognized with a number of patient care, teaching, and research awards.

Outside of work, Olavo is passionate about traveling and experiencing/discovering world cultures, learning about culinary skills, and spirituality.

Ema Ferreira, B.Pharm., M.Sc., Pharm.D.

In 1991 Dr. Ferreira completed a bachelor's degree in pharmacy at Université de Montréal, followed by a master's degree in hospital pharmacy from the same institution. After working for three years in hospital and community pharmacy, Dr. Ferreira enrolled in the Pharm.D. program at the University of British Columbia, which she completed in 1997. A residency in perinatology at Children's and Women's Health Centre of British Columbia and the Long Beach Memorial Medical Center in California was a prerequisite for a joint position between CHU Ste-Justine and the Faculty of Pharmacy, Université de Montréal, which she has held since 1997.

Dr. Ferreira is a clinical associate professor with the following teaching foci: obstetrics, gynaecology, contraception, drugs in pregnancy and lactation, and pharmacy clerkships. She has received three teaching awards for the quality of her teaching.

At CHU Ste-Justine, Dr. Ferreira started a pharmaceutical care service in obstetrics and gynaecology in 1998 and has been actively involved in patient care since then. She is also involved in research in the field of drug use during pregnancy and lactation. Her clinical practice and research has been recognized by her peers with two awards.

Dr. Ferreira is the author of numerous publications and conferences related to fields of interests such as contraception and drugs in pregnancy and lactation.

Patricia E. Gerber, B.Sc.(Pharmacy), Pharm.D.

Patricia Gerber earned her Bachelor of Science in Pharmacy degree at the University of British Columbia (UBC) in 1993, and completed a Hospital Pharmacy Residency at British Columbia's Children's Hospital (now Children's and Women's Health Centre of British Columbia, C&W) in 1994. She earned her Doctor of Pharmacy degree from UBC in 1997.

Patricia began her hospital pharmacy career at C&W as a Clinical Pharmacist in Adolescent Psychiatry. Concurrently she became involved with the Faculty of Pharmaceutical Sciences at UBC as the Course Coordinator of the Advanced Pharmaceutical Care course that had just been introduced in the Faculty, and one which was recognized in 1995 by the American Association of Colleges of Pharmacy with an Honourable Mention for the Innovations in Teaching Award. After receiving her Pharm.D. degree in 1997, Patricia accepted a cross-appointed position as Clinical Pharmacy Specialist in Pediatric Neurology at C&W and Assistant Professor at the Faculty of Pharmaceutical Sciences at UBC. In that role, which she held until 2002, Patricia solidified her interest and expertise in pediatric pharmacotherapy and was involved in educating and mentoring pharmacy residents, as well as undergraduate and graduate pharmacy students and medical residents, both in the practice setting as well as in various courses at UBC. In her clinical practice Patricia was involved in the delivery of pharmaceutical care to pediatric patients, and she had significant involvement in patient education initiatives and in a number of research projects, both on the in-patient ward and the out-patient neurology clinic.

In 2002, while maintaining her cross-appointment with the Faculty, Patricia accepted the position of Pharmacy Education Coordinator at C&W (which transitioned into her current role as Pharmacy Education and Residency Coordinator in 2005). In this role Patricia has supported C&W pharmacists in their continuing education, teaching, and precepting assignments, as well as mentored new preceptors. She is involved in coordinating, teaching, and precepting students, residents, and trainees at C&W.

Throughout her career, Patricia has demonstrated significant involvement and leadership in CSHP. As a CSHP member since 1993, she has participated in the organization in a number of ways, including active involvement in the CHSP Research Committee and the BC Branch Programs Committee. In addition, she has contributed to the Canadian Journal of Hospital Pharmacy (CJHP) both with a number of publications and as an expert reviewer. Patricia has been an invited speaker at nine CSHP events both within and outside of BC. She has also had significant involvement in other organizations, such as the Pediatric Pharmacy Advocacy Group (PPAG), where she has participated in committees and as an invited speaker at numerous annual conferences. Patricia has published extensively in the area of pediatrics and, most recently, has focused her research interests on pharmacy education. She has been an invited speaker at a number of local, national, and international conferences in a variety of pediatric topics. She has also served as an expert reviewer for a number of pediatric publications and CE programs.

Patricia has also served in a number of institutional, legislative, and university committees and has contributed to the efforts of a number of community-based public health education initiatives.

Patricia is honoured to receive a CSHP Fellowship and would like to acknowledge her wonderful pharmacy colleagues and friends who have supported and mentored her along the way.

Outside of Pharmacy, Patricia enjoys spending time with her husband, Rob, and she treasures her most important job as 'Mom' to their two kids, Jessica and Daniel.

Wendy Gordon, B.Sc. (Pharmacy), Pharm.D.

Wendy Gordon earned her Bachelor of Science (Pharmacy) and her Pharm.D. degrees at the University of British Columbia (UBC) in 1990 and 1997 respectively. After completing a residency at Royal Columbian Hospital in 1991, she practised at Victoria General Hospital and then returned to Royal Columbian Hospital in 1992 to practice in the area of Cardiology and Cardiac Surgery.

Wendy's area of expertise is cardiology. She provides patient care services to the coronary care unit, cardiac catheterization lab, and the cardiac surgery intensive care unit. In addition to providing clinical expertise, Wendy develops and participates in cardiac research. Her current projects involve assessment of adherence to cardiovascular medication and cardiovascular risk factor reduction.

Wendy became involved in the British Columbia Branch, CSHP, early in her career. She served as Branch Treasurer in 1993; and in 1994 Wendy started her term as President Elect, followed by President in 1995, and Past President in 1996. She is also a member of the Canadian Cardiovascular Society.

Wendy is a preceptor for undergraduate pharmacy students, residents, and Pharm.D. candidates. She was voted the most valuable Pharm.D. preceptor for the Fraser Health Authority residency program and was given honourable mention for preceptor of the UBC Pharm.D. program in 2004/2005. She has also supervised many residency research projects. Wendy is co-preceptor of the cardiology rotation for first-year medical residents and was a member of a team of pharmacists who received a teaching award from the medical residents in 2005/2006.

Wendy provides specialized education to all health care professionals. She participates in continuing education activities for physicians and nurses and provides lectures to other health care professionals.

Donald P. Hamilton, B.Sc.(Pharmacy)

Don graduated from the Faculty of Pharmaceutical Sciences at the University of British Columbia and then completed a hospital pharmacy residency at Lion's Gate Hospital in North Vancouver. After working as a staff pharmacist at St. Paul's Hospital, he returned to Lion's Gate as the Education Supervisor for the Pharmacy Department. Don is currently the Clinical Coordinator for the Pharmacy Department at Children's and Women's Health Center of B.C. As a cross-appointment to the Faculty of Pharmaceutical Sciences, UBC, he has achieved the position of Clinical Professor, Part-time.

In 1985 Don became the Coordinator of the Children's Hospital pharmacy residency program, and he also served for seven years on the Canadian Hospital Pharmacy Residency Board. While maintaining pharmacy department responsibilities for clinical and education programs, he has served on a long list of hospital and faculty committees, including Chairperson for the hospital's Pharmacy, Therapeutics, and Nutrition Committee for five years. He continues to be active in teaching and research activities and has published in a wide variety of areas.

Don has been involved in professional leadership positions provincially, nationally, and internationally. Past involvements have included Councillor for the College of Pharmacists of B.C., Executive of B.C. Branch, CSHP; and Board Member for the Pediatric Pharmacy Advocacy Committee. Recognition from professional organizations includes: Distinguished Service Award, B.C. Branch, CSHP; Dean's Certificate of Merit Award, UBC; Award of Merit, College of Pharmacists of B.C.; and the Education Award of Excellence With Distinction, Children's and Women's Health Center of B.C. Don's greatest rewards have come from working with the dedicated, enthusiastic, and professional staff of the Pharmacy Department at Children's and Women's Health Center of B.C.

Neil J. MacKinnon, B.Sc.(Pharmacy), M.Sc.(Pharmacy), Ph.D.

Neil is a native of Bridgewater, Nova Scotia. He received his B.Sc. (Pharmacy) degree from Dalhousie University in 1993, and he then traveled to Madison, Wisconsin, where he completed an M.Sc. in Hospital Pharmacy and an Advanced Administrative Residency at the University of Wisconsin Hospital and Clinics from 1993 to 1995. Following that he completed a Ph.D. in Pharmacy Health Care Administration at the University of Florida and a Research Fellowship at the DuBow Family Center for Research in Pharmaceutical Care with Dr. Charles D. Hepler.

Neil is currently the Associate Director for Research and an Associate Professor at the Dalhousie University College of Pharmacy. Neil is also cross-appointed to Dalhousie's Department of Community Health and Epidemiology, Faculty of Medicine, and to the School of Health Services Administration, Faculty of Health Professions.

Neil's primary research interests include studying adverse consequences of medication use, such as preventable drug-related morbidity and medication errors. He is currently the PI or co-investigator on several research grants studying these issues.

Neil has served CSHP at both the provincial and national levels, including as a member of the Hospital Pharmacy Management Leadership Task Force and Chair of the ad-hoc committee for drafting the position statement on the role of the pharmacist as head of hospital pharmacy services.

Neil edited a book published in April 2003 by the Canadian Pharmacists Association called *Seamless Care: A Pharmacist's Guide to Continuous Care Programs,* and he is currently working on a second book, also to be published by the Canadian Pharmacists Association, on the safety and quality of the medication use system. Neil has authored or co-authored over 60 papers in peer-reviewed literature and has given over 100 presentations at scientific meetings. Neil is a two-time recipient of the Jessie I. MacKnight Award for Teaching Excellence, as selected by the senior year pharmacy students at Dalhousie University.

Neil and his wife Leanne have three daughters, Breagh, Ashlynn and Kaylee. He currently serves as President of

the Atlantic Fellowship of Evangelical Baptist Churches, and he is a member of the National Council of the Fellowship of Evangelical Baptist Churches.

Monique M. Pitre, B.Sc.(Pharmacy)

Monique Pitre received a Bachelor of Science in Pharmacy degree from Dalhousie University in 1983, and a certificate in Departmental Management from the Canadian Hospital Association in 1986. Following graduation Monique started her career at the Campbellton Regional Hospital in her home province of New Brunswick. She worked in Campbellton as the Director of Pharmacy until 1986. In the summer of 1986 Monique moved to Switzerland where she completed an Industrial Training Program with Sandoz Ltd. She was part of the International Pharmacy Student Federation (IPSF) exchange program.

On her return to Canada in 1987 Monique joined the Toronto General Hospital as a staff pharmacist in General Medicine and Orthopedic Surgery. She soon moved on to be a team coordinator in Nephrology and Multi-organ Transplantation. In July of 1991 Monique took a new position as Drug Utilization Coordinator. This position allowed Monique to pursue her interest in infectious disease and antimicrobial management. Monique became an active member of the Infectious Disease Consult Service and a member of the Antibiotic Subcommittee of the Pharmacy and Therapeutics Committee.

In 2001 the University Health Network started undergoing major technological changes that would impact pharmacy practice and drug utilization. In order to meet the challenges, Monique accepted the newly-created position of Manager, Pharmacy Clinical Informatics. In this new role Monique and her team are responsible for assuring safe and appropriate medication orders across all computer systems. This includes the implementation of computerized physician medication order entry and the electronic medication administration record.

Monique is actively involved in the UHN Pharmacy Residency Program and was program coordinator for several years. She has been a preceptor for the infectious disease rotation for the past 15 years, and is also an infectious disease preceptor for Pharm.D. candidates from the University of Toronto. As well, Monique teaches at the Faculty of Pharmacy, University of Toronto, conducting small group case study seminars and lectures on infectious disease topics.

Monique has been an active member of CSHP throughout her career. She has participated at the provincial level as an Ontario Branch Chapter Chair and Chair of the Ontario Branch Drug Use Evaluation Professional Specialty Group. Nationally, she is an active member of the Infectious Diseases Pharmacy Specialty Network (PSN) and the Pharmacy Informatics PSN.

Monique's contribution to her profession has been recognized by her peers through the bestowal of the Canadian Society of Hospital Pharmacists' Apotex Award (2001); the Ontario Branch, CSHP, William McLean Clinical Pharmacist Award (2004); and the Ontario Branch, CSHP, E. Amy Eck Award (1994).

Cathy Sochasky, B.Sc.Pharm.

Cathy Sochasky received her Bachelor of Science in Pharmacy degree from the University of Manitoba. She started her career as a dispensing hospital pharmacist at McMaster Medical Centre in Hamilton, Ontario. After a year Cathy returned to Winnipeg to work at the Health Sciences Centre, practicing in various areas including the investigational drug area and in geriatrics and rheumatology as a clinical pharmacist.

In the early 80's Cathy was charged with the responsibility of setting up and maintaining the first Drug Information Centre in Winnipeg at the Health Sciences Centre. She was also involved, under the direction of the Formulary and P&T Committees, with the development of the first HSC Formulary and the current Winnipeg Regional Formulary. As a result of hospital regionalization in 2000, Cathy, in conjunction with another full-time pharmacist, now provides services to nine Winnipeg hospitals and to health professionals within the province.

Her drug information responsibilities include precepting pharmacy residents, orientating students and new pharmacists, publishing and revising a *Handbook of Drug and Therapeutic Information* and formulary update bulletins, and dealing with formulary issues as a member of the Formulary and P&T Committees.

As an educator in drug information, and with a special interest in rheumatology, Cathy is a regular speaker for

the national and local Arthritis Society. She also provides drug information lectures to hospital pharmacists and the University of Manitoba Faculty of Pharmacy students.

In 2001 Cathy was honored to receive the Merck Frosst CSHP Award for Outstanding Achievement in Pharmacy Practice for the Manitoba Branch of CSHP. In 2002 she received the Manitoba Pharmaceutical Association's Bonnie Schultz Memorial Award for Excellence in Pharmacy Practice.

Cathy has served as Treasurer, Education Chairperson, Awards Committee Chairperson, President, and Past President of the Manitoba Branch, CSHP.

Finally, outside of work, Cathy is active with the Joints in Motion fundraising program of the Arthritis Society. Since 2001, she has participated in five marathons, raising money for arthritis research.

Adil S. Virani, B.Sc.(Pharmacy), Pharm.D.

Adil Virani graduated with his Bachelor of Pharmacy and Doctor of Pharmacy degrees from the University of British Columbia in 1992 and 1997 respectively. Dr. Virani has worked in many settings and facilities, including psychiatric and forensic institutions, community pharmacies, and general and pediatric hospitals in British Columbia and Nova Scotia. From August 1999 to April 2005 Dr. Virani was the Clinical Pharmacy Consultant at the IWK Health Centre in Halifax and an Assistant Professor with the Department of Psychiatry and the College of Pharmacy at Dalhousie University.

Dr. Virani has spent the majority of his pharmacy career working with children, adolescents, and adults suffering from psychiatric disorders. He has conducted research in the areas of ADHD, first episode psychosis, and mood disorders. At Dalhousie University he coordinated a full-year critical appraisal skills course that focused on evidence-based practices for pharmacists and physicians. He has published numerous articles and co-edited a 300-page book entitled *Clinical Handbook of Psychotropic Drugs for Children and Adolescents*. The second edition of this book will be published in 2007. In 2004 Dr. Virani was awarded the Jessie I. McKnight Award for Excellence in Teaching.

Currently Dr. Virani is the Regional Pharmacy Manager with the Fraser Health Authority. He works with the staff at various hospitals in the region to advance the level of clinical practice and pharmacy operations. He also oversees the Drug Use Evaluation and Drug information programs as well as all the community-based pharmacy programs. Here he researches the health outcomes of interventions made by pharmacists conducting home-based visits. Dr. Virani is an Assistant Professor with the Faculty of Pharmaceutical Sciences at the University of British Columbia and lectures on various topics to undergraduate and Doctor of Pharmacy students.

CSHP would like to recognize the generous contributions of the following speakers:
La SCPH désire souligner les généreuses contributions des conférenciers suivants :

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Fraser Health Authority
Vancouver, BC

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Hôpital du Sacré-Couer de Montréal
Montréal, QC

Marisa Battistella
University Health Network
Toronto, ON

Nicole Bidwell
Regina Qu'Appelle Health Region
Regina, SK

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Southlake Regional Health Centre
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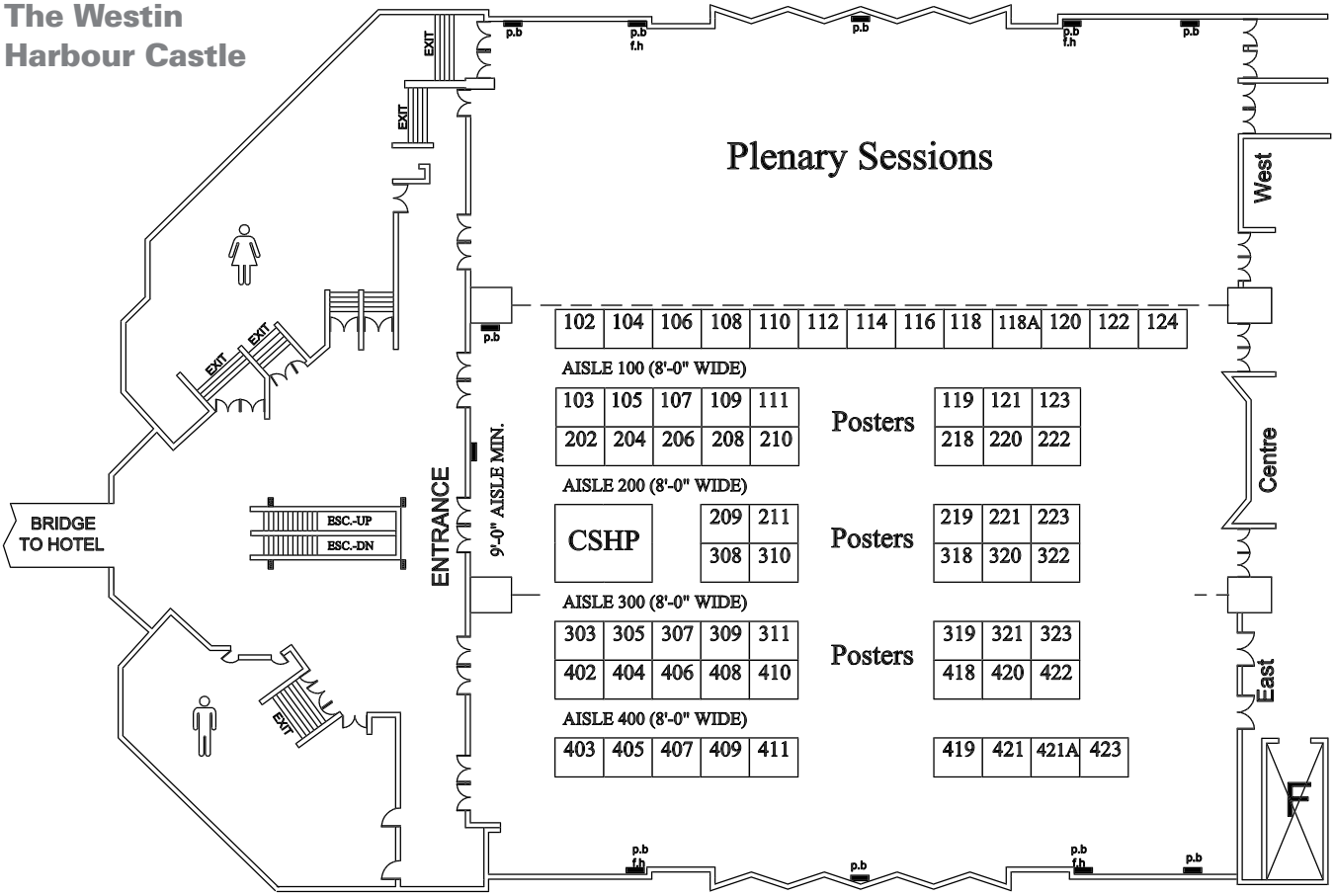

Exhibitors List/Liste des exposants

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LIPITOR®
atorvastatin calcium
tablets

power** you can **trust™

PrLIPITOR® (atorvastatin calcium) 10 mg, 20 mg, 40 mg and 80 mg tablets

THERAPEUTIC CLASSIFICATION: Lipid Metabolism Regulator

ACTIONS AND CLINICAL PHARMACOLOGY

Please refer to the Product Monograph for complete ACTIONS AND CLINICAL PHARMACOLOGY information.

INDICATIONS AND CLINICAL USE

Hypercholesterolemia

LIPITOR (atorvastatin calcium) is indicated as an adjunct to lifestyle changes, including diet (at least equivalent to the Adult Treatment Panel III (ATP III) TLC diet), for the reduction of elevated total cholesterol (total-C), LDL-C, TG and apolipoprotein B (apo B) in hyperlipidemic and dyslipidemic conditions, when response to diet and other nonpharmacological measures alone has been inadequate, including:

Primary hypercholesterolemia (Type IIa); Combined (mixed) hyperlipidemia (Type IIb), including familial combined hyperlipidemia, regardless of whether cholesterol or triglycerides are the lipid abnormality of concern; Dysbetalipoproteinemia (Type III); Hypertriglyceridemia (Type IV); Familial hypercholesterolemia (homozygous and heterozygous). For homozygous familial hypercholesterolemia, LIPITOR should be used as an adjunct to treatments such as LDL apheresis, or as monotherapy if such treatments are not available; an adjunct to diet to reduce total-C, LDL-C, and apo B levels in boys and postmenarchal girls, 10 to 17 years of age with heterozygous familial hypercholesterolemia, if after an adequate trial of diet therapy the following findings are still present:

a. LDL-C remains ≥4.9 mmol/L (190 mg/dL) or
b. LDL-C remains ≥4.1 mmol/L (160 mg/dL) and:
   - there is a positive family history of premature cardiovascular disease or
   - two or more other CVD risk factors are present in the pediatric patient

LIPITOR also raises HDL-cholesterol and therefore lowers the LDL-C/HDL-C and total-C/HDL-C ratios in patients with primary hypercholesterolemia and combined (mixed) hyperlipidemia (Fredrickson Type IIa and IIb dyslipidemia). In pooled data from 24 controlled clinical trials, LIPITOR raised HDL-C levels 5%-7% in primary hypercholesterolemic (Type IIa) patients and 10%-15% in mixed (Type IIb) dyslipidemic patients.

In clinical trials, LIPITOR (10 to 80 mg/day) significantly improved lipid profiles in patients with a wide variety of hyperlipidemic and dyslipidemic conditions. In 2 dose-response studies in mildly to moderately hyperlipidemic patients (Fredrickson Types IIa and IIb), LIPITOR reduced the levels of total cholesterol (29-45%), LDL-C (39-60%), apo B (32-50%), TG (19-37%), and increased high density lipoprotein cholesterol (HDL-C) levels (5-9%). Comparable responses were achieved in patients with heterozygous familial hypercholesterolemia, non-familial forms of hypercholesterolemia, combined hyperlipidemia, including familial combined hyperlipidemia and patients with non-insulin dependent diabetes mellitus. In patients with hypertriglyceridemia (Type IV), LIPITOR (10 to 80 mg daily) reduced TG (25-56%) and LDL-C levels (23-40%). LIPITOR has not been studied in conditions where the major abnormality is elevation of chylomicrons (TG levels >11 mmol/L), i.e., Types I and V.

In an open-label study in patients with dysbetalipoproteinemia (Type III), LIPITOR (10 to 80 mg daily) reduced total-C (40-57%), TG (40-56%) and IDL-C + VLDL-C levels (34-58%).

In an open-label study in patients with homozygous familial hypercholesterolemia (FH), LIPITOR (10 to 80 mg daily) reduced mean LDL-C levels (22%). In a pilot study, LIPITOR 80 mg/day showed a mean LDL-C lowering of 30% for patients not on plasmapheresis and of 31% for patients who continued plasmapheresis. A mean LDL-C lowering of 35% was observed in receptor defective patients and of 19% in receptor negative patients.

Prior to initiating therapy with LIPITOR, secondary causes should be excluded for elevations in plasma lipid levels (e.g., poorly controlled diabetes mellitus, hypothyroidism, nephrotic syndrome, dysproteinemias, obstructive liver disease and alcoholism), and a lipid profile performed to measure total cholesterol, LDL-C, HDL-C and TG. For patients with TG <4.52 mmol/L (<400 mg/dL), LDL-C can be estimated using the following equation:

LDL-C (mmol/L) = total-C - [(0.37 x (TG) + HDL-C)]
LDL-C (mg/dL) = total-C - [(0.2 x (TG) + HDL-C)][1]

For patients with TG levels >4.52 mmol/L (>400 mg/dL), this equation is less accurate and LDL-C concentrations should be measured directly or by ultracentrifugation.

Patients with high or very high triglyceride levels, i.e., >2.2 mmol/L (200 mg/dL) or >5.6 mmol/L (500 mg/dL), respectively, may require triglyceride-lowering therapy (fenofibrate, bezafibrate or nicotinic acid) alone or in combination with LIPITOR.

In general, combination therapy with fibrates must be undertaken cautiously and only after risk-benefit analysis (see **WARNINGS – Muscle Effects; PRECAUTIONS – Pharmacokinetic Interaction Studies and Potential Drug Interactions**).

Elevated serum triglycerides are most often observed in patients with the metabolic syndrome (abdominal obesity, atherogenic dyslipidemia [elevated triglycerides, small dense LDL particles and low HDL-cholesterol], insulin resistance with or without glucose intolerance, raised blood pressure and prothrombic and proinflammatory states).

(For the treatment of specific dyslipidemias, refer to the Report of the Canadian Working Group on Hypercholesterolemia and Other Dyslipidemias or to the US NCEP Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults [Adult Treatment Panel III], under **REFERENCES**).

When drugs are prescribed, attention to therapeutic lifestyle changes (reduced intake of saturated fats and cholesterol, weight reduction, increased physical activity, ingestion of soluble fibres) should always be maintained and reinforced.

Prevention of Cardiovascular Disease

LIPITOR is indicated to reduce the risk of myocardial infarction in adult hypertensive patients without clinically evident coronary heart disease, but with at least 3 additional risk factors for coronary heart disease such as: age ≥55 years, male sex, smoking, type 2 diabetes, left ventricular hypertrophy, other specified abnormalities on ECG, microalbuminuria or proteinuria, ratio of plasma total cholesterol to HDL-C ≥6 or premature family history of coronary heart disease.

LIPITOR is also indicated to reduce the risk of myocardial infarction and stroke in adult patients with type 2 diabetes mellitus and hypertension without clinically evident coronary heart disease, but with other risk factors such as age ≥55 years, retinopathy, albuminuria or smoking.

CONTRAINDICATIONS

Hypersensitivity to any component of this medication.

Active liver disease or unexplained persistent elevations of serum transaminases exceeding 3 times the upper limit of normal (see **WARNINGS**).

Pregnancy and nursing women: Cholesterol and other products of cholesterol biosynthesis are essential components for fetal development (including synthesis of steroids and cell membranes). LIPITOR should be administered to women of childbearing age only when such patients are highly unlikely to conceive and have been informed of the possible harm. If the patient becomes pregnant while taking LIPITOR, the drug should be discontinued immediately and the patient apprised of the potential harm to the fetus. Atherosclerosis being a chronic process, discontinuation of lipid metabolism regulating drugs during pregnancy should have little impact on the outcome of long-term therapy of primary hypercholesterolemia (see **PRECAUTIONS – Use in Pregnancy, Use in Nursing Mothers**).

WARNINGS

Pharmacokinetic Interactions

The use of HMG-CoA reductase inhibitors has been associated with severe myopathy, including rhabdomyolysis, which may be more frequent when they are co-administered with drugs that inhibit the cytochrome P-450 enzyme system. Atorvastatin is metabolized by cytochrome P-450 isoform 3A4 and as such may interact with agents that inhibit this enzyme (see **WARNINGS – Muscle Effects; PRECAUTIONS – Pharmacokinetic Interaction Studies and Potential Drug Interactions, Cytochrome P-450-mediated Interactions**).

Muscle Effects

Effects on skeletal muscle such as myalgia, myopathy and very rarely, rhabdomyolysis have been reported in patients treated with LIPITOR. **Very rare cases of rhabdomyolysis with acute renal failure secondary to myoglobinuria, have been reported with LIPITOR and other HMG-CoA reductase inhibitors.**

Myopathy, defined as muscle pain or muscle weakness in conjunction with increases in creatine kinase (CK) values to >10 times the upper limit of normal, should be considered in any patient with diffuse myalgia, muscle tenderness or weakness, and/or marked elevation of CK. Patients should be advised to report promptly any unexplained muscle pain, tenderness or weakness, particularly if accompanied by malaise or fever. Patients who develop any signs or symptoms suggestive of myopathy should have their CK levels measured. LIPITOR therapy should be discontinued if markedly elevated CK levels are measured or myopathy is diagnosed or suspected.

Predisposing Factors for Myopathy/Rhabdomyolysis: LIPITOR, as with other HMG-CoA reductase inhibitors, should be prescribed with caution in patients with predisposing factors for myopathy/rhabdomyolysis. Such factors include:

Personal or family history of hereditary muscular disorders; Previous history of muscle toxicity with another HMG-CoA reductase inhibitor; Concomitant use of a fibrate or niacin; Hypothyroidism; Alcohol abuse; Excessive physical exercise; Age >70 years; Renal impairment; Hepatic impairment; Diabetes with hepatic fatty change; Surgery and trauma; Frailty; Situations where an increase in plasma levels of active ingredient may occur.

LIPITOR therapy should be temporarily withheld or discontinued in any patient with an acute serious condition suggestive of myopathy or having a risk factor predisposing to the development of renal failure secondary to rhabdomyolysis (such as sepsis, severe acute infection, hypotension, major surgery, trauma, severe metabolic, endocrine and electrolyte disorders and uncontrolled seizures).

LIPITOR therapy should be discontinued if markedly elevated CPK levels occur or myopathy is diagnosed or suspected. The risk of myopathy and rhabdomyolysis during treatment with HMG-CoA reductase inhibitors is increased with concurrent administration of cyclosporin, fibric acid derivatives, erythromycin, clarithromycin, niacin (nicotinic acid), azole antifungals or nefazodone. As there is no experience to date with the use of LIPITOR given concurrently with these drugs, with the exception of pharmacokinetic studies conducted in healthy subjects with erythromycin and clarithromycin, the benefits and risks of such combined therapy should be carefully considered (see **PRECAUTIONS – Pharmacokinetic Interaction Studies and Potential Drug Interactions**).

Hepatic Effects

In clinical trials, persistent increases in serum transaminases >3 times the upper limit of normal occurred in <1% of patients who received LIPITOR. When the dosage of LIPITOR was reduced, or when drug treatment was interrupted or discontinued, serum transaminase levels returned to pretreatment levels. The increases were generally not associated with jaundice or other clinical signs or symptoms. Most patients continued treatment with a reduced dose of LIPITOR without clinical sequelae.

Liver function tests should be performed before the initiation of treatment, and periodically thereafter. Special attention should be paid to patients who develop elevated serum transaminase levels, and in these patients measurements should be repeated promptly and then performed more frequently.

If increases in alanine aminotransferase (ALT) or aspartate aminotransferase (AST) show evidence of progression, particularly if they rise to >3 times the upper limit of normal and are persistent, the dosage should be reduced or the drug discontinued.

LIPITOR, as well as other HMG-CoA reductase inhibitors, should be used with caution in patients who consume substantial quantities of alcohol and/or have a past history of liver disease. Active liver disease or unexplained transaminase elevations are contraindications to the use of LIPITOR; if such a condition should develop during therapy, the drug should be discontinued.

PRECAUTIONS

General

Before instituting therapy with LIPITOR (atorvastatin calcium), an attempt should be made to control elevated serum lipoprotein levels with appropriate diet, exercise, and weight reduction in overweight patients, and to treat other underlying medical problems (see **INDICATIONS AND CLINICAL USE**). Patients should be advised to inform subsequent physicians of the prior use of LIPITOR or any other lipid-lowering agents.

Effect on the Lens

Current long-term data from clinical trials do not indicate an adverse effect of atorvastatin on the human lens.

Effect on Ubiquinone (CoQ_{10}) Levels

Significant decreases in circulating ubiquinone levels in patients treated with atorvastatin and other statins have been observed. The clinical significance of a potential long-term statin-induced deficiency of ubiquinone has not been established. It has been reported that a decrease in myocardial ubiquinone levels could lead to impaired cardiac function in patients with borderline congestive heart failure.

Effect on Lipoprotein (a)

In some patients, the beneficial effect of lowered total cholesterol and LDL-C levels may be partly blunted by a concomitant increase in Lp(a) lipoprotein concentrations. Present knowledge suggests the importance of high Lp(a) levels as an emerging risk factor for coronary heart disease. It is thus desirable to maintain and reinforce lifestyle changes in high risk patients placed on atorvastatin therapy.

Hypersensitivity

An apparent hypersensitivity syndrome has been reported with other HMG-CoA reductase inhibitors which has included 1 or more of the following features: anaphylaxis, angioedema, lupus erythematous-like syndrome, polymyalgia rheumatica, vasculitis, purpura, thrombocytopenia, leukopenia, hemolytic anemia, positive ANA, ESR increase, eosinophilia, arthritis, arthralgia, urticaria, asthenia, photosensitivity, fever, chills, flushing, malaise, dyspnea, toxic epidermal necrolysis, erythema multiforme, including Stevens-Johnson syndrome. Although to date hypersensitivity syndrome has not been described as such, LIPITOR should be discontinued if hypersensitivity is suspected.

Use in Pregnancy

LIPITOR is contraindicated during pregnancy (see **CONTRAINDICATIONS**).

There are no data on the use of LIPITOR during pregnancy. LIPITOR should be administered to women of childbearing age only when such patients are highly unlikely to conceive and have been informed of the potential hazards. If the patient becomes pregnant while taking LIPITOR, the drug should be discontinued and the patient apprised of the potential risk to the fetus.

Use in Nursing Mothers

In rats, milk concentrations of atorvastatin are similar to those in plasma. It is not known whether this drug is excreted in human milk. Because of the potential for adverse reactions in nursing infants, women taking LIPITOR should not breast-feed (see **CONTRAINDICATIONS**).

Pediatric Use

Safety and effectiveness of LIPITOR in patients 10-17 years of age (N=140) with heterozygous familial hypercholesterolemia have been evaluated in a controlled clinical trial of 6 months duration in adolescent boys and postmenarchal girls. Patients treated with LIPITOR had a safety and tolerability profile generally similar to that of placebo. Doses >20 mg have not been studied in this patient population.

LIPITOR had no effect on growth or sexual maturation in boys and in girls. The effects on menstrual cycle were not assessed [see **ADVERSE REACTIONS** and **DOSAGE AND ADMINISTRATION** for **Heterozygous Familial Hypercholesterolemia in Pediatric Patients (10-17 years of age)**].

Adolescent females should be counselled on appropriate contraceptive methods while on LIPITOR therapy (see **CONTRAINDICATIONS; PRECAUTIONS – Use in Pregnancy**). LIPITOR has not been studied in controlled clinical trials involving pre-pubertal patients or patients younger than 10 years of age.

Doses of LIPITOR up to 80 mg/day for 1 year have been evaluated in 8 pediatric patients with homozygous familial hypercholesterolemia.

Geriatric Use

Treatment experience in adults 70 years or older (N=221) with doses of LIPITOR up to 80 mg/day has demonstrated that the safety and effectiveness of atorvastatin in this population was similar to that of patients <70 years of age. Pharmacokinetic evaluation of atorvastatin in subjects over the age of 65 years indicates an increased AUC. As a precautionary measure, the lowest dose should be administered initially.

Elderly patients may be more susceptible to myopathy (see **WARNINGS – Muscle Effects – Predisposing Factors for Myopathy/Rhabdomyolysis**).

Renal Insufficiency

Plasma concentrations and LDL-C lowering efficacy of LIPITOR was shown to be similar in patients with moderate renal insufficiency compared with patients with normal renal function. However, since several cases of rhabdomyolysis have been reported in patients with a history of renal insufficiency of unknown severity, as a precautionary measure and pending further experience in renal disease, the lowest dose (10 mg/day) of LIPITOR should be used in these patients. Similar precautions apply in patients with severe renal insufficiency [creatine clearance <30 mL/min (<0.5 mL/sec)]; the lowest dosage should be used and implemented cautiously (see **WARNINGS – Muscle Effects; PRECAUTIONS – Pharmacokinetic Interaction Studies and Potential Drug Interactions**). Refer also to **DOSAGE AND ADMINISTRATION**.

Endocrine Function

HMG-CoA reductase inhibitors interfere with cholesterol synthesis and as such might theoretically blunt adrenal and/or gonadal steroid production. Clinical studies with atorvastatin and other HMG-CoA reductase inhibitors have suggested that these agents do not reduce plasma cortisol concentration or impair adrenal reserve and do not reduce basal plasma testosterone concentration. However, the effects of HMG-CoA reductase inhibitors on male fertility have not been studied in adequate numbers of patients. The effects, if any, on the pituitary-gonadal axis in premenopausal women are unknown.

Patients treated with atorvastatin who develop clinical evidence of endocrine dysfunction should be evaluated appropriately. Caution should be exercised if an HMG-CoA reductase inhibitor or other agent used to lower cholesterol levels is administered to patients receiving other drugs (e.g., ketoconazole, spironolactone or cimetidine) that may decrease the levels of endogenous steroid hormones.

Pharmacokinetic Interaction Studies and Potential Drug Interactions

Pharmacokinetic interaction studies conducted with drugs in healthy subjects may not detect the possibility of a potential drug interaction in some patients due to differences in underlying diseases and use of concomitant medications (see **PRECAUTIONS – Geriatric Use, Renal Insufficiency; Patients with Severe Hypercholesterolemia**).

Concomitant Therapy with Other Lipid Metabolism Regulators: Based on post-marketing surveillance, gemfibrozil, fenofibrate, other fibrates and lipid-lowering doses of niacin (nicotinic acid) may increase the risk of myopathy when given concomitantly with HMG-CoA reductase inhibitors, probably because they can produce myopathy when given alone (see **WARNINGS – Muscle Effects**). Therefore, combined drug therapy should be approached with caution.

Bile Acid Sequestrants:

Patients with mild to moderate hypercholesterolemia: LDL-C reduction was greater when LIPITOR 10 mg and colestipol 20 g were coadministered (-45%) than when either drug was administered alone (-35% for LIPITOR and -22% for colestipol).

Patients with severe hypercholesterolemia: LDL-C reduction was similar (-53%) when LIPITOR 40 mg and colestipol 20 g were coadministered when compared to LIPITOR 80 mg alone. Plasma concentration of atorvastatin was lower (approximately 26%) when LIPITOR 40 mg plus colestipol 20 g were coadministered compared with LIPITOR 40 mg alone. However, the combination drug therapy was less effective in lowering triglycerides than LIPITOR monotherapy in both types of hypercholesterolemic patients.

When LIPITOR is used concurrently with colestipol or any other resin, an interval of at least 2 hours should be maintained between the two drugs, since the absorption of LIPITOR may be impaired by the resin.

Fibric Acid Derivatives (Gemfibrozil, Fenofibrate, Bezafibrate) and Niacin (nicotinic acid): Although there is limited experience with the use of LIPITOR given concurrently with fibric acid derivatives and niacin, the benefits and risks of such combined therapy should be carefully considered. The risk of myopathy during treatment with drugs in this class, including atorvastatin, is increased with concurrent administration (see **WARNINGS – Muscle Effects**).

Coumarin Anticoagulants: LIPITOR had no clinically significant effect on prothrombin time when administered to patients receiving chronic warfarin therapy.

Digoxin: In healthy subjects, digoxin pharmacokinetics at steady-state were not significantly altered by coadministration of digoxin 0.25 mg and LIPITOR 10 mg daily. However, digoxin steady-state concentrations increased approximately 20% following coadministration of digoxin 0.25 mg and LIPITOR 80 mg daily. Patients taking digoxin should be monitored appropriately.

Antihypertensive agents (amlodipine): In clinical studies, LIPITOR was used concomitantly with antihypertensive agents without evidence to date of clinically significant adverse interactions. In healthy subjects, atorvastatin pharmacokinetics were not altered by the coadministration of LIPITOR 80 mg and amlodipine 10 mg at steady state.

(quinapril): In a randomized, open-label study in healthy subjects, steady-state quinapril dosing (80 mg QD) did not significantly affect the pharmacokinetic profile of atorvastatin tablets (10 mg QD).

Oral Contraceptives and Hormone Replacement Therapy: Coadministration of LIPITOR with an oral contraceptive containing 1 mg norethindrone and 35 µg ethinyl estradiol increased plasma concentrations (AUC levels) of norethindrone and ethinyl estradiol by approximately 30% and 20%, respectively. These increases should be considered when selecting an oral contraceptive. In clinical studies, LIPITOR was used concomitantly with estrogen replacement therapy without evidence of clinically significant adverse interactions.

Antacids: Administration of aluminum and magnesium based antacids, such as Maalox® TC Suspension, with LIPITOR decreased plasma concentrations of LIPITOR by approximately 35%. LDL-C reduction was not altered but the triglyceride-lowering effect of LIPITOR may be affected.

Cimetidine: Administration of cimetidine with LIPITOR did not alter plasma concentrations or the LDL-C lowering efficacy of LIPITOR, however, the triglyceride-lowering effect of LIPITOR was reduced from 34% to 26%.

Cytochrome P-450-mediated Interactions: Atorvastatin is metabolized by the cytochrome P-450 isoenzyme, CYP 3A4. Erythromycin, a CYP 3A4 inhibitor, increased atorvastatin plasma levels by 40%. Coadministration of CYP 3A4 inhibitors, such as grapefruit juice, some macrolide antibiotics (i.e., erythromycin, clarithromycin), immunosuppressants (cyclosporine), azole antifungal agents (i.e., itraconazole, ketoconazole), protease inhibitors, or the antidepressant nefazodone, may have the potential to increase plasma concentrations of HMG-CoA reductase inhibitors, including LIPITOR. Caution should thus be exercised with concomitant use of these agents (see **WARNINGS – Pharmacokinetic Interactions, Muscle Effects; PRECAUTIONS – Renal Insufficiency, Endocrine Function; DOSAGE AND ADMINISTRATION**).

Terfenadine: In healthy subjects, coadministration of maximum doses of atorvastatin (80 mg) and terfenadine (120 mg), a CYP 3A4 substrate, was shown to produce a modest increase in terfenadine AUC. The QTc interval remained unchanged. However, since an interaction between these two drugs cannot be excluded in patients with predisposing factors for arrhythmia, (e.g., pre-existing prolonged QT interval, severe coronary artery disease, hypokalemia), caution should be exercised when these agents are coadministered (see **WARNINGS – Pharmacokinetic Interactions; DOSAGE AND ADMINISTRATION**).

Antipyrine: Antipyrine was used as a non-specific model for drugs metabolized by the microsomal hepatic enzyme (cytochrome P-450) system. LIPITOR had no effect on the pharmacokinetics of antipyrine, thus interactions with other drugs metabolized via the same cytochrome isozymes are not expected.

Macrolide Antibiotics (azithromycin, clarithromycin, erythromycin): In healthy adults, coadministration of LIPITOR (10 mg QD) and azithromycin (500 mg QD) did not significantly alter the plasma concentrations of atorvastatin. However, coadministration of atorvastatin (10 mg QD) with erythromycin (500 mg QID) or clarithromycin (500 mg BID), which are both CYP 3A4 inhibitors, increased plasma concentrations of atorvastatin by approximately 40% and 80%, respectively (see **WARNINGS – Muscle Effects**).

Protease Inhibitors (nelfinavir mesylate): In healthy adults, coadministration of nelfinavir mesylate (1250 mg BID), a known CYP 3A4 inhibitor, and atorvastatin (10 mg QD) resulted in increased plasma concentrations of atorvastatin. AUC and C_{max} of atorvastatin were increased by 74% and 122% respectively.

Patients with Severe Hypercholesterolemia

Higher drug dosages (80 mg/day) required for some patients with severe hypercholesterolemia (including familial hypercholesterolemia) are associated with increased plasma levels of atorvastatin. **Caution should be exercised in such patients who are also severely renally impaired, elderly, or are concomitantly being administered digoxin or CYP 3A4 inhibitors** (see **WARNINGS – Pharmacokinetic Interactions, Muscle Effects; PRECAUTIONS – Pharmacokinetic Interaction Studies and Potential Drug Interactions; DOSAGE AND ADMINISTRATION**).

Drug/Laboratory Test Interactions

LIPITOR may elevate serum transaminase and creatine kinase levels (from skeletal muscle). In the differential diagnosis of chest pain in a patient on therapy with LIPITOR, cardiac and noncardiac fractions of these enzymes should be determined.

ADVERSE REACTIONS

LIPITOR is generally well-tolerated. Adverse reactions have usually been mild and transient. In controlled clinical studies (placebo-controlled and active-controlled comparative studies with other lipid-lowering agents) involving 2502 patients, <2% of patients were discontinued due to adverse experiences attributable to LIPITOR. Of these 2502 patients, 1721 were treated for at least 6 months and 1253 for 1 year or more.

Adverse experiences occurring at an incidence ≥1% in patients participating in placebo-controlled clinical studies of LIPITOR and reported to be possibly, probably or definitely drug related include constipation, diarrhea, dyspepsia, flatulence, nausea, headache, pain, myalgia and asthenia.

The following additional adverse events were reported in clinical trials (not all have been associated with a causal relationship to LIPITOR therapy): muscle cramps, myositis, myopathy, paresthesia, peripheral neuropathy, pancreatitis, hepatitis, cholestatic jaundice, anorexia, vomiting, alopecia, pruritus, rash, impotence, hyperglycemia and hypoglycemia.

Heterozygous Familial Hypercholesterolemia in Pediatric Patients (ages 10-17 years)

In a 26-week controlled study in boys and postmenarchal girls (n=187, where 140 patients received LIPITOR), the safety and tolerability profile of LIPITOR 10 to 20 mg daily was similar to that of placebo. The adverse events reported in ≥1% of patients were abdominal pain, depression and headache (see **PRECAUTIONS – Pediatric Use**).

Laboratory Changes and Adverse Events

The criteria for clinically significant laboratory changes were >3 X the upper limit of normal (ULN) for liver enzymes, and >5 X ULN for creatine kinase. A total of 8 unique subjects met one or more of these criteria during the double-blind phase. Hence, the incidence of patients who experienced abnormally high enzymatic levels (AST/ALT and creatine kinase) was >4% (8/187).

Five atorvastatin and one placebo subjects had increases in CK >5 X ULN during the double-blind phase; two of the five atorvastatin-treated subjects had increases in CK >10 X ULN. Two subjects had clinically significant increases in ALT.

Post-Market Adverse Drug Reaction: The following adverse events have also been reported during post-marketing experience with LIPITOR, regardless of causality assessment: Very rare reports: severe myopathy with or without rhabdomyolysis (see **WARNINGS – Muscle Effects; PRECAUTIONS – Renal Insufficiency, Pharmacokinetic Interaction Studies and Potential Drug Interactions**). Isolated reports: Gynecomastia, thrombocytopenia, arthralgia and allergic reactions including urticaria, angioneurotic edema, anaphylaxis and bullous rashes (including erythema multiforme, Stevens-Johnson syndrome and toxic epidermal necrolysis) and fatigue. These may have no causal relationship to atorvastatin.

Abnormal Hematologic and Clinical Chemistry Findings

Ophthalmologic observations: see **PRECAUTIONS**.

Laboratory Tests: Increases in serum transaminase levels have been noted in clinical trials (see **PRECAUTIONS**).

DOSAGE AND ADMINISTRATION

Patients should be placed on a standard cholesterol-lowering diet [at least equivalent to the Adult Treatment Panel III (ATP III) TLC diet] before receiving LIPITOR, and should continue on this diet during treatment with LIPITOR. If appropriate, a program of weight control and physical exercise should be implemented.

Prior to initiating therapy with LIPITOR, secondary causes for elevations in plasma lipid levels should be excluded. A lipid profile should also be performed.

Primary Hypercholesterolemia and Combined (Mixed) Dyslipidemia, Including Familial Combined Hyperlipidemia

The recommended starting dose of LIPITOR is 10 or 20 mg once daily, depending on the patient's LDL-C reduction required (see Tables 1 and 2). Patients who require a large reduction in LDL-C (more than 45%) may be started at 40 mg once daily. The dosage range of LIPITOR is 10 to 80 mg once daily. Doses can be given at any time of the day, with or without food, and should preferably be given in the evening. A significant therapeutic response is evident within 2 weeks, and the maximum response is usually achieved within 2-4 weeks. The response is maintained during chronic therapy. Adjustments of dosage, if necessary, should be made at intervals of 2 to 4 weeks. The maximum dose is 80 mg/day.

TABLE 1. Dose-Response in Patients With Mild-to-Moderate Hypercholesterolemia (Mean Percent Change from Baseline)[a]

Lipid Parameter	LIPITOR Dose (mg/day)			
	10 (N=22)	20 (N=20)	40 (N=21)	80 (N=23)
Total-C: 7.1 mmol/L[b] (273 mg/dL)[b]	-29	-33	-37	-45
LDL-C: 4.9 mmol/L[b] (190 mg/dL)[b]	-39	-43	-50	-60

[a] Results are pooled from 2 dose-response studies

[b] Mean baseline values

The dosage of LIPITOR should be individualized according to the baseline LDL-C, total-C/HDL-C ratio and/or TG levels to achieve the recommended target lipid values at the lowest dose needed to achieve the LDL-C target (see Recommendations for the Management of Dyslipidemia and the Prevention of Cardiovascular Disease [Canada], summarized below in Table 2, and/or the Third Report of the US National Cholesterol Education Program [NCEP Adult Treatment Panel III]), and the patient's response. Lipid levels should be monitored periodically and, if necessary, the dose of LIPITOR adjusted based on target lipid levels recommended by guidelines.

TABLE 2. Canadian Recommendations for the Target Lipid Values Based on Level of Risk

Risk Category	Target Levels		
	LDL-C level (mmol/L)		Total-C/HDL-C ratio
High† (10-year risk of CAD ≥20%, or a history of diabetes mellitus†† or any atherosclerotic disease)	<2.5	**and**	<4.0
Moderate (10-year risk 11%-19%)	<3.5	**and**	<5.0
Low††† (10-year risk ≤10%)	<4.5	**and**	<6.0

Note: LDL-C = low-density lipoprotein cholesterol.

† Apolipoprotein B can be used as an alternative measurement, particularly for follow-up of patients treated with statins. An optimal level of apolipoprotein B in a patient at high risk is <0.9 g/L, in a patient at moderate risk <1.05 g/L and in a patient at low risk <1.2 g/L.

†† Includes patients with chronic kidney disease and those undergoing long-term dialysis.

††† In the 'very low' risk stratum, treatment may be deferred if the 10-year estimate of cardiovascular disease is <5% and the LDL-C level is <5.0 mmol/L.

Severe Dyslipidemias

In patients with severe dyslipidemias, including homozygous and heterozygous familial hypercholesterolemia and dysbetalipoproteinemia (Type III), higher dosages (up to 80 mg/day) may be required (see **WARNINGS – Pharmacokinetic Interactions, Muscle Effects; PRECAUTIONS – Pharmacokinetic Interaction Studies and Potential Drug Interactions**).

Heterozygous Familial Hypercholesterolemia in Pediatric Patients (10-17 years of age)

In this population, the recommended starting dose of LIPITOR is 10 mg/day; the maximum recommended dose is 20 mg/day (doses >20 mg/day have not been studied in this patient population). Doses should be individualized according to the recommended goal of therapy (see NCEP Pediatric Panel Guidelines; **INDICATIONS AND CLINICAL USE**). Adjustments should be made at intervals of 4 weeks or more.

NCEP (National Cholesterol Education Program) Pediatric Panel Guidelines: Classification of cholesterol levels in pediatric patients with a familial history of hypercholesterolemia or premature cardiovascular disease is summarized below:

Category	Total-C (mmol/L [mg/dL])	LDL-C (mmol/L [mg/dL])
Acceptable	<4.4 [170]	<2.8 [110]
Borderline	4.4-5.1 [170-199]	2.8-3.3 [110-129]
High	≥5.2 [200]	≥3.4 [130]

Concomitant Therapy

See **PRECAUTIONS – Drug/Laboratory Test Interactions**.

Dosage in Patients With Renal Insufficiency

See **PRECAUTIONS**.

AVAILABILITY OF DOSAGE FORMS

LIPITOR (atorvastatin calcium) is available in dosage strengths of 10 mg, 20 mg, 40 mg and 80 mg atorvastatin per tablet.

1. Friedewald WT, *et al. Clin Chem* 1972;18(6):489-502.

For a copy of the Product Monograph or full Prescribing Information, please contact:

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HEPARIN SODIUM Injection, USP

Anticoagulant

DESCRIPTION

Heparin Sodium Injection, USP is a sterile, non-pyrogenic solution of a highly purified sodium salt of heparin, a high molecular weight polysaccharide derived from porcine intestinal mucosa or beef lung. It is standardized in *vitro* according to the method of USP and is labeled in terms of USP units for use as an anticoagulant. It acts very rapidly and, even in large doses, is metabolized in the body and eliminated within 24 hours. It will not lyse existing thrombi or emboli.

ACTIONS

Heparin inhibits the clotting of blood and the formation of fibrin clots both in *vitro* and *in vivo*. In combination with a cofactor, it inactivates thrombin thus preventing the conversion of fibrinogen to fibrin. Heparin also prevents the formation of a stable fibrin clot by inhibiting the activation of the fibrin stabilizing factor.

Heparin Sodium inhibits reactions which lead to clotting but does not alter the normal components of the blood. Although clotting time is prolonged by therapeutic doses, bleeding time is usually unaffected. Heparin Sodium does not have fibrinolytic activity; therefore, it will not lyse existing clots.

INDICATIONS

Used in the treatment of thrombophlebitis, phlebothrombosis, and cerebral, coronary, and retinal vessel thrombosis to prevent extension of clots and thromboembolic phenomena. Also used prophylactically to prevent the occurrence of thromboembolism, and to prevent clotting during dialysis and surgical procedures, particularly vascular surgery.

When using Heparin Sodium Injection, USP in conjunction with dialysis machines or where the Heparin Sodium Injection, USP is added to glucose or saline, it is most important that the pH is not less than 5 for Heparin Sodium Injection, USP to act as an effective anticoagulant. Under pH 5 degradation sets in and with a pH around 4 or less there is very little Heparin Sodium Injection, USP activity. Likewise with pH over 8.5 there will be some degradation. Recent work has indicated that early hemodialysis is of value in cases of multiple trauma.

Heparin Sodium Injection, USP has also been used as an anticoagulant in blood transfusion samples, particularly when the presence of citrates, oxalates or fluorides might interfere with laboratory tests, such as electrolyte determination. Anti-inflammatory and diuretic activity has been obtained with Heparin Sodium Injection, USP, however, these properties have not yet been put to any widespread clinical use.

LOW-DOSE SUBCUTANEOUS HEPARIN

For the prevention of serious venous thromboembolic complications in high risk surgical patients.

CONTRAINDICATIONS

Patients with a generalized clotting disorder such as hemophilia, Christmas disease, idiopathic thrombocytopenic purpura and patients with active bleeding from a local lesion such as an acute ulcer or ulcerating carcinoma; patients who have had recent cranial, spinal, eye or ear surgery or trauma; hypersensitivity to heparin, including thrombocytopenia; severe liver damage; shock.

WARNINGS

1. Administration of large doses of Heparin Sodium Injection, USP should be delayed four hours postoperatively.
2. When any of the conditions mentioned under precautions are present, the advantages of Heparin Sodium Injection, USP therapy must be carefully weighed against the possibility of deleterious results.

PRECAUTIONS

The use of i.v. heparin in the treatment of ischemic stroke is controversial. Clinical trials investigating the benefits of heparin in ischemic stroke have been inconclusive. Heparin may increase the risk of clinically significant cerebral bleeding. Administration of an i.v. bolus of heparin is not recommended in the treatment of stroke. If heparin is used, brain imaging should be performed prior to initiation of therapy to exclude hemorrhage and estimate infarct size.

When considered for use in any of the following conditions, the advantages of heparin therapy must be carefully weighed against the risks: subacute bacterial endocarditis; increased capillary permeability; dissecting aneurysm; severe hypertension; during and immediately following major surgery, especially of the brain, spinal cord, eye or ear; conditions associated with increased bleeding tendencies such as hemophilia, thrombocytopenia and some purpuras; inaccessible gastrointestinal ulcers; ulcerative colitis; continuous tube drainage of stomach or small intestine; threatened abortion; menstruation; malignant hypertension.

Heparin Sodium Injection, USP should be used with caution in the immediate postoperative period. Bleeding may be concealed, as in the case of hemothorax.

In patients with a history of heparin-induced thrombocytopenia (HIT), heparinoids (e.g., danaparoid), lepirudin and ancrod are considered appropriate alternatives to heparin.

When used in therapeutic doses, heparin should be regulated by frequent blood coagulation indicators particularly the APTT. If the indicator is unduly prolonged or if hemorrhage occurs, heparin should be at least temporarily discontinued (see **OVERDOSAGE)**.

Heparin can prolong the prothrombin time.

Apparent resistance to heparin may be encountered in patients with acquired or familial AT III deficiency, because adequate levels of AT III are required for heparin's anticoagulant effect. Larger doses of heparin may be required initially in patients with various disease states due to alterations in their physiology, the pharmacokinetics of the drug, or elevations in levels of acute phase heparin binding proteins. Among these are febrile illness, infections associated with thrombosing tendencies, pulmonary embolism, myocardial infarction, extensive thrombotic disorders especially those associated with neoplastic disease and following surgery.

Heparin should be used with caution in the presence of severe hepatic or renal disease, or in patients with indwelling catheters. A higher incidence of bleeding may be seen in women over 60 years of age.

IM injections of other drugs should be avoided during heparin therapy to reduce the risk of hematoma formation and bleeding from the site. Most drugs can be given by another route (i.v. or s.c.).

For these reasons strict laboratory control of dosage is necessary. Heparin Sodium Injection, USP should be used with caution in patients with allergy. Patients on long term daily administration of Heparin Sodium Injection, USP should be observed for the possible development of osteoporosis and spontaneous fractures of ribs and/or vertebrae.

Drug Interactions:

Oral anticoagulants (i.e., warfarin) can contribute to a small extent to an increase in APTT. Heparin can contribute to an increase in PT. While these two drugs are given together, the fact that each may contribute to an increase in PT and APTT should be taken into account (see **PRECAUTIONS**).

Heparin is often started with or several hours after thrombolytic therapy. Close patient monitoring for clinical signs of bleeding is indicated. The APTT should also be monitored closely (see **DOSAGE)**.

Salicylates, other nonsteroidal anti-inflammatory agents, dextran, dipyridamole, clopidogrel, ticlopidine and GPIIb-IIIa antagonists (e.g., abciximab) interfere with platelet aggregation which increases the risk of bleeding. They should be used cautiously with monitoring for signs of hemorrhage. In addition, in some situations, when heparin is used in conjunction with GPIIb-IIIa antagonists the dose of heparin may need to be modified (see **DOSAGE: Coronary Surgery**).

Cefamandole, cefotetan, methimazole, propylthiouracil and valproic acid may cause hypoprothrombinemia and increase the risk of bleeding; monitoring for signs of bleeding is indicated. This may occur to a lesser extent with cefazolin, cefoxitin and ceftriaxone.

IV nitroglycerin may reduce heparin's anticoagulant effect and necessitate higher doses. This interaction has been reported to occur regardless of whether or not propylene glycol is used as a solvent for the nitroglycerin. The mechanism has not been conclusively documented. When i.v. nitroglycerin therapy is initiated, patients should be closely monitored to ensure anticoagulation remains adequate. Likewise, when nitroglycerin therapy is stopped, a decrease in heparin dosage may be necessary and patients should be monitored for signs of excessive anticoagulation.

Digitalis, quinine, ACTH, insulin, corticosteroids, antihistamines and nicotine have been reported to interfere with the anticoagulant effect of heparin; however, there is no substantial literature support to document these interactions.

Care must be taken where large doses of antibiotics and/or drugs containing amino groups are administered along with or prior to Heparin Sodium Injection, USP administration.

Drugs such as: Codeine Phosphate, Pethidine hydrochloride, Streptomycin, Erythromycin, Kanamycin, Neomycin, Novobiocin, Tetracyclines, Ampicillin, Penicillin G, Polymyxin B, Vancomycin, Hydrocortisone Sodium Succinate (S-Cortilean), Pentobarbitone, Promazine hydrochloride, Vitamin B complex, Vitamin C.

Heparin Sodium Injection, USP may complex with these drugs -- this complex may be reversible (Heparin rebound) and may result in excess bleeding at the surgical site. Extra protamine sulfate may then be indicated.

Although digitalis, quinine, tetracycline, antihistamines, and nicotine have been stated to interfere with the anticoagulant activity of heparin, there is no substantial literature support for such "interactions". The chemical interaction occurring between heparin and protamine is well known. This interaction is used clinically to antagonize the anti-coagulant effect of heparin.

Ethacrynic Acid: Intravenously administered ethacrynic acid can cause GI bleeding. However, a significantly higher incidence of GI bleeding has been attributed to the concurrent use of intravenous ethacrynic acid and heparin. Furosemide may be a safer alternative when diuretic therapy is indicated in the patient receiving heparin.

Acetylsalicylic Acid: In a review article of heparin therapy, it was advocated that concurrent acetylsalicylic acid administration be "scrupulously avoided". While documentation to support this interaction is incomplete, it would be prudent to avoid concurrent therapy. Acetylsalicylic Acid impairs the platelet release reaction and this platelet function defect combined with the anticoagulant effect of heparin may produce a hemorrhagic tendency.

Dextran: Limited data suggest that dextran and heparin may act synergistically when administered concurrently. Although the data are inadequate to document the clinical significance of this interaction, baseline laboratory measurements of anticoagulant activity should be obtained upon initiation of concurrent therapy as well as at frequent intervals during such therapy.

Pregnancy:
Heparin does not cross the placenta and has not been related to congenital defects. However, its use during pregnancy has been associated with a 13 to 22% risk of fetal mortality or prematurity. It is not clear whether severity of maternal disease or an indirect effect of heparin is responsible. Coumarin anticoagulants have been associated with a 31% incidence of unfavorable outcome and a definite drug-induced pattern of malformations has been demonstrated (fetal warfarin syndrome). However, the incidence of warfarin-induced fetopathic effects in the second and third trimesters is very low. In general, heparin is considered to be the anticoagulant of choice in pregnancy. Long-term usage (>3 to 5 months) of therapeutic doses of heparin during pregnancy increases the risk of osteoporosis and warrants careful monitoring of patients. Heparin therapy during the last trimester and immediate postpartum period is associated with a risk of maternal hemorrhage. Changes in pharmacokinetics during pregnancy require caution and close patient monitoring if heparin is used.

Reports of therapeutic failure with adjusted-dose heparin therapy in pregnant patients with prosthetic heart valves may have been due to inadequate dosing and/or monitoring or to an inherent lack of efficacy in these patients. The American College of Chest Physicians recommends that if subcutaneous heparin is used in pregnant patients with mechanical heart valves, it be administered every 12 hours and the dose adjusted to keep the mid-interval APTT at least twice the control, or an anti-Xa heparin level of 0.35 to 0.7 U/mL. In addition, some clinicians suggest an initial dose of 17,500 to 20,000 units s.c. every 12 hours.

Lactation:
Heparin is not excreted in breast milk because of its high molecular weight.

Please also refer to the pH requirements in hemodialysis under "INDICATIONS".

ADVERSE EFFECTS

Bone and Joint: Therapeutic doses of heparin administered for longer than 3 months have been associated with osteoporosis and spontaneous vertebral fractures. Recent reports indicate that osteoporosis may be reversible after discontinuation of heparin.

Hematologic: Bleeding is the most common side effect of heparin and is an extension of its pharmacological effect. The rate of occurrence is approximately 10% overall but may increase up to 20% in patients treated with high dose therapy. Risk of bleeding likely increases with APTT ratios above the recommended target range. Other risk factors associated with bleeding are: a serious concurrent illness, chronic heavy consumption of alcohol, use of platelet-inhibiting drugs, renal failure, age and female sex. Bleeding may range from minor local ecchymoses to major hemorrhagic events. Often the first sign of bleeding may be epistaxis, hematuria or melena. Bleeding may be from any site and can be difficult to detect, e.g., retroperitoneal bleeds. Bleeding may also occur from surgical sites. Petechiae or easy bruising may precede frank hemorrhage. A supratherapeutic APTT or minor bleeding during therapy can usually be controlled by adjusting the dosage or withdrawing the drug (see **OVERDOSAGE**).

Thrombocytopenia has also been described with heparin treatment. Heparin Induced Thrombocytopenia (HIT) is an allergic reaction. It has been reported to occur in 1 to 30% of patients treated with standard heparin. It has also occurred with the use of LMWHs, both in patients with a history of HIT and patients with no previous exposure to heparin. The risk of developing HIT may be lower with LMWHs, but cannot be reliably estimated until more patients have been exposed. It is thought to be more common with heparin derived from bovine lung (5-10%) than from porcine gut (2-5%). Two types of acute, reversible thrombocytopenia have been described. Mild thrombocytopenia most commonly occurs between 5 and 12 days after initiation of full dose therapy. Platelet count usually remains above 100 x 10^9/L, and heparin therapy does not necessarily have to be withdrawn. Platelet count may remain stable or even increase despite continued therapy; however, it should still be monitored. The more severe, delayed form of thrombocytopenia (platelets <100 x 10^9/L, is much less frequent, usually appearing 5 to 12 days after starting heparin therapy and recurs rapidly on rechallenge. It has occurred with low dosages and is not dose related. It is generally reversible; platelet counts usually begin to return to normal within 4 days of stopping heparin. Paradoxically, patients may develop thrombotic complications including arterial thrombosis, gangrene, stroke, myocardial infarction and disseminated intravascular coagulation. Thrombosis is due to "white clots" composed of platelets and fibrin that result from marked *in vivo* platelet aggregation. Patients receiving heparin acutely should have platelet counts monitored at least every 2 or 3 days.

Hepatic: Heparin has been reported to cause elevations of AST and ALT in approximately 27 and 59% of patients, respectively. Transient increases in serum LDH levels have also occurred. No clinical signs of liver dysfunction have been reported and the significance is not known, except that interpretation of liver enzymes for other purposes (i.e., liver disease) must take into consideration the possible contribution of heparin.

Hypersensitivity: Heparin-induced thrombocytopenia (see **ADVERSE EFFECTS**, Hematologic). Other allergic reactions to heparin are rare. The most common manifestations of hypersensitivity are chills, fever and urticaria. Asthma, rhinitis, tearing, headache, nausea, vomiting, shock and anaphylactoid reactions have also occurred. Vasospasm has been reported 6 to 10 days after starting heparin; the etiology is thought to be allergic. Vasospasm often appears in a limb where an artery has recently been catheterized. The affected limb is usually painful, ischemic and cyanotic. Protamine sulfate is of no use in hypersensitivity reactions.

Miscellaneous: Alopecia, affecting the entire scalp or confined to the temple, may occur. Itching and burning of the plantar surfaces of the feet. Suppression of aldosterone product, hyperkalemia (due to aldosterone suppression), priapism and rebound hyperlipidemia have also been reported.

Heparin Neutralization with Protamine
Bleeding which may occur during therapy with heparin can usually be corrected by withdrawal. Clotting time should then return to normal in 30 to 60 minutes provided venous clotting time is not longer than 15 minutes when the infusion is interrupted. Should withdrawal of Heparin Sodium fail to control bleeding, fresh, matched blood (not more than three days old) may be administered in quantities of 250 to 500 mL.

The most rapid means of counteracting the effects of heparin is intravenous administration of protamine sulfate injection. However, protamine is by itself an anticoagulant and therefore excess must be avoided. A dosing ratio of 1 milligram protamine for every 100 units of heparin remaining in the patient is the usual rule. It is recommended that protamine doses be guided by blood coagulation studies to determine if additional doses are required. The activated partial thromboplastin time (APTT) or activated clotting time (ACT) are adequate for this purpose.

Allowance should be made for the rapid removal of heparin from circulation. The rate of heparin removal from plasma is dose-dependent. However, it may be assumed that about 30 minutes after an intravenous injection, about 50% of the heparin is removed from circulation.

So the amount of protamine sulfate required to neutralize the heparin will be that of approximately half of that required for the original dose. For example, if 1,000 units required 10 mg of protamine sulfate for neutralization, half an hour after intravenous administration of a 5,000 unit dose, the amount of protamine sulfate required will only be approximately:

5 / 2 x 10 = 25 mg

Too rapid administration of protamine can cause severe hypotensive and anaphylactoid reactions. Facilities to treat shock should be readily available when administering protamine. The rate of protamine administration should not exceed 20 mg/min and no more than 50 mg should be given in any 10 minute period. Doses exceeding 100 mg in a short period of time should be avoided, unless there is certain knowledge of larger protamine requirements. Any excess protamine sulfate, not complexed to heparin, has its own intrinsic anticoagulant effect. However, one study found overdose of protamine up to 600 to 800 mg i.v. to have only minor, transient effects on blood coagulation.

OVERDOSAGE

Symptoms: Overdose may be manifested by excessive prolongation of the APTT or by bleeding. Bleeding may be internal or external, major or minor.

Treatment: See **Heparin Neutralization with Protamine.**

DOSAGE AND ADMINISTRATION

Please note:

1. Intramuscular injection (especially in the arm or thigh) and shallow subcutaneous injection is not recommended. The duration of effect is shortened and it is more likely to produce pain and hematoma.
2. Heparin Sodium activity is expressed in USP units and should be prescribed in units only.

The route of administration may be i.v. or s.c., depending upon the situation and the choice of the prescriber. Adequate heparin-induced anticoagulant therapy is present when the clotting time is elevated from 2 to 3 times normal as measured by the Lee-White method. Two types of dosage schedule are suggested: Heparin Sodium Injection, USP may be administered intravenously in a dose of 5,000 USP units every 4 hours or in a dose of 10,000 USP units every 6 hours, depending upon the results of a whole blood clotting time test performed at the bedside just prior to each additional dose. If the clotting time is less than twice normal, the next dose is increased by one-third to one-half. If the clotting time is more than $2\frac{1}{2}$ times normal, the next dose is decreased by one-third to one-half. If the clotting time is between 2 and $2\frac{1}{2}$ times normal, the regular dose is repeated.

SUBCUTANEOUS INJECTION TECHNIQUE

Use of a 1 mL tuberculin syringe with a No. 25 or No. 26 -$\frac{1}{2}$ inch needle is recommended.

STEP 1 Disinfect area with alcohol then apply pressure between finger and thumb to the dermal fold until the injection site is blanched.

STEP 2. Insert the needle into the raised, blanched area. Reduce the pressure on the skin and inject the Heparin Sodium Injection, USP slowly.

STEP 3. Withdraw the needle quickly and apply alcohol swab pressure to the site of injection for 5 - 10 seconds to prevent loss of the heparin.

DOSAGE

ADMINISTRATION		
METHOD	**FREQUENCY**	**RECOMMENDED DOSAGE***
Low-dose Subcutaneous†	Every 8 to 12 hours	5,000 units
Subcutaneous	Every 8 hours	10,000 to 20,000 units initially** then 8,000 to 10,000 units three times a day.
Intermittent Intravenous	Every 4 to 6 hours	10,000 units initially, then 5,000 to 10,000 units four to six times a day.
Intravenous Infusion	Continuous or Intermittent	20,000 to 40,000 units per litre at a rate of 15 to 30 units per minute.
Dialysis	See below	See below
Usual Pediatric Dose	Every 4 hours	By intravenous infusion, 50 units per kg of body weight initially, followed by 100 units per kg or 3,333 units per square meter of body surface, six times a day.

* Based on 68 kg of body weight (approx. 150 lbs)

† It is not necessary to monitor low-dose prophylactic Heparin Sodium Injection, USP

** Following immediately after an initial dose of 5,000 units i.v.

Dilution Instruction for IV Infusion:

Heparin Sodium Injection, USP may be diluted to 20,000 to 40,000 units per liter (or 20 units to 40 units/mL) with 5% Dextrose Injection; 0.9% Sodium Chloride Injection; 0.45% Sodium Chloride Injection; 5% Dextrose and 0.45% Sodium Chloride Injection; or 5% Dextrose and 0.9% Sodium Chloride Injection in PVC bag. Diluted solution may be stored up to 24 hours at controlled room temperature.

As with all parenteral drug products, intravenous admixtures should be inspected visually for clarity, particulate matter, precipitate, discoloration and leakage prior to administration, whenever solution and container permit. Solutions showing haziness, particulate matter, precipitate, discoloration or leakage should not be used. Discard unused portion.

THERAPY REQUIRED

1. **Low Dose Subcutaneous Heparin Sodium**
   There is now good evidence that low dose heparin is effective in preventing serious venous thromboembolic complications in high risk surgical patients. The usually recommended dose is 5,000 units subcutaneously 2 hours before surgery and then 5,000 units given every 12 or 8 hours after surgery with the first dose given at approximately 12 hours after surgery. It is not necessary to monitor low dose prophylactic heparin.

2. **Therapeutic Anticoagulant Action (immediate and short term)**
   The dose should be adjusted in keeping with the patient's clotting time which should be determined just prior to the injection during the first day of treatment. It is also recommended that, in order to help regulate dosage, the clotting time be determined on the second and third day of treatment. (The recommended method is the Lee-White whole blood method.)

   Anticoagulation is adequate when the clotting time is 2 to 3 times the normal value.

   Subcutaneous administration is usually employed for maintenance therapy after initial regulation.

3. **Long Term Protective Anticoagulant Action**
   Subcutaneous administration of 15,000 units every 12 hours is usually employed. Daily injections of 20,000 to 30,000 units have also been employed with success. After initial regulation the dosage should be adjusted according to weekly to monthly clotting time determinations. Anticoagulant therapy should not be terminated abruptly but should be gradually reduced over 3 - 4 days.

4. **Deep Venous Thrombosis and Pulmonary Embolism**
   Dosage of 20,000 units daily for 6 - 10 days has been of value.

5. **Hemodialysis**
   (a) Multiple Trauma
   Recent literature has suggested the use of early hemodialysis in multiple trauma.

   (b) Chronic Renal Failure
   The use of hemodialysis in this area has increased dramatically in recent years and may be in-hospital or home dialysis. It is most important to stress that the instructions for each equipment manufacturer's unit must be followed scrupulously.

   The following is merely intended as an overall summary of possible general procedures:

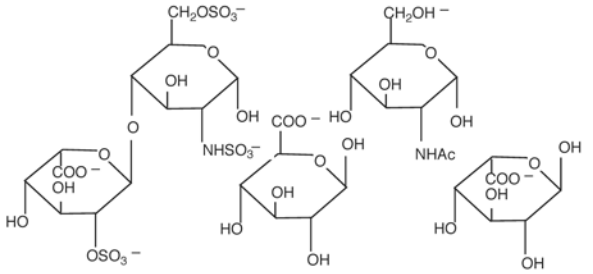
   - 3,000 units of Heparin Sodium Injection, USP is added to 1,000 mL of sterile saline as a dialyser flush prior to connection.
   - Initial dosage: 5,000 units of Heparin Sodium Injection, USP into the venous shunt or 2,500 units into the arterial fistula needle.
   - With the shunt type, the usual continuing dosage is 2,000 units per hour; with the fistula type, 1,500 units per hour by means of a suitable syringe and a pump to allow continuing infusion. Heparin Sodium Injection, USP reversal with Protamine Sulfate will be decided by the individual physician. Usually this is not done unless dialysis is being performed soon after surgery.

6. **Coronary and Vascular Surgery**
   Patients undergoing total body perfusion for open heart surgery should receive an initial dose of not less than 150 units of Heparin Sodium Injection, USP per kilogram of body weight. Frequently a dose of 300 units of Heparin Sodium Injection, USP per kilogram of body weight is used for procedures estimated to last less than 60 minutes; or 400 units/kg for those estimated to last longer than 60 minutes.

PHARMACEUTICAL INFORMATION

Drug Substance:

Proper Name: Heparin Sodium
CAS No.: 9041-08-1
Structural Formula:



(1) (2) (3) (4) (5)

Description: Heparin is a heterogeneous group of straight-chain anionic mucopolysaccarides, called glycosaminiglycans, having anticoagulant properties. Although others may be present, the main sugars occurring in heparin are: (1) α-L-iduronic acid 2-sulfate, (2) 2-deoxy-2-sulfamino-α-D-glucose 6-sulfate, (3) β-D-glucuronic acid, (4) 2-acetamido-2-deoxy-α-D-glucose, (5) α-L-iduronic acid. These sugars are present in decreasing amounts, usually in the order (2) > (1) > (4) > (3) > (5), and are joined by glycosidic linkages, forming polymers of varying sizes. Heparin is strongly acidic because of its content of covalently linked sulfate and carboxylic acid groups. In heparin sodium, the acidic protons of the sulfate units are partially replaced by sodium ions. Heparin sodium is derived from porcine intestinal mucosa, standardized for anticoagulant activity.

Stability and Storage Recommendations:

Store Heparin Sodium Injection, USP multidose vial at 15°- 30°C. Protect from freezing. Discard unused portion 28 days after initial puncture.

AVAILABILITY

Heparin Sodium Injection, USP is supplied in the following concentrations and package sizes. Vial stoppers do not contain natural rubber latex.

C504701 1,000 USP Units/mL in 1 mL multidose vial in package of 25 vials. Also contains methylparaben 1.5 mg/mL, propylparaben 0.15 mg/mL. Sodium Chloride 9 mg/mL for isotonicity, and q.s. to 1 mL with Water for Injection. Porcine intestinal mucosa origin.

C504710 1,000 USP Units/mL in 10 mL multidose vial in package of 25 vials. Also contains methylparaben 1.5 mg/mL, propylparaben 0.15 mg/mL. Sodium Chloride 9 mg/mL for isotonicity, and q.s. to 10 mL with Water for Injection. Porcine intestinal mucosa origin.

C504730 1,000 USP Units/mL in 30 mL multidose vial in package of 25 vials. Also contains methylparaben 1.5 mg/mL, propylparaben 0.15 mg/mL. Sodium Chloride 9 mg/mL for isotonicity, and q.s. to 30 mL with Water for Injection. Porcine intestinal mucosa origin.

C504801 10,000 USP Units/mL in 1 mL multidose vial in package of 25 vials. Also contains methylparaben 1.5 mg/mL, propylparaben 0.15 mg/mL, and q.s. to 1 mL with Water for Injection. Porcine intestinal mucosa origin.

C504805 10,000 USP Units/mL in 5 mL multidose vial in package of 25 vials. Also contains methylparaben 1.5 mg/mL, propylparaben 0.15 mg/mL, and q.s. to 5 mL with Water for Injection. Porcine intestinal mucosa origin.

Hydrochloric acid and/or sodium hydroxide may have been added for pH adjustment.

Parenteral drug products should be inspected visually for particulate matter and discolouration prior to use.

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INDICATION Used in the treatment of thrombophlebitis, phlebothrombosis, and cerebral, coronary, and retinal vessel thrombosis to prevent extension of clots and thromboembolic phenomena. Also used prophylactically to prevent the occurrence of thromboembolism, and to prevent clotting during dialysis and surgical procedures, particularly vascular surgery.

Please consult prescribing information for complete indications, warnings, precautions, adverse events and important patient criteria.

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