CJHP JCPH

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

35th Annual Professional Practice Conference

35e Conférence annuelle sur la pratique professionelle

The Largest Pharmacy Conference in Canada

Le plus grand congrès en pharmacie au Canada

January 31-February 4, 2004
31 janvier-4 février 2004

Sheraton Centre Toronto Hotel
123 Queen St. West
Toronto, Ontario

Canadian Society of Hospital Pharmacists
Société canadienne des pharmaciens d'hôpitaux

LIPITOR*: Hitting targets.

Aiming beyond.

EFFICACY ➢ † A powerful demonstrated effect across key lipid parameters[1]

EXPERIENCE ➢ More than ~~44~~ 48 million patient-years of experience[2‡]

EVIDENCE ➢ Demonstrated delayed time to first ischemic event in stable CAD patients (n=164, p=0.03)[3¥]

LIPITOR has a leading edge clinical research program exploring new areas that may extend beyond lipid control[4]

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, LDL-C, TG and apolipoprotein 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 also raises HDL-cholesterol and therefore lowers the LDL-C/HDL-C and Total-C/HDL-C ratios (Fredrickson Type IIa and IIb). These changes in HDL-C with HMG-CoA reductase inhibitors should be considered as modest when compared to those observed in LDL-C and do not play a primary role in the lowering of LDL-C/HDL-C and Total-C/HDL-C ratios.

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

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.

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.

The effects of atorvastatin-induced changes in lipoprotein levels, including reduction of serum cholesterol on cardiovascular morbidity, mortality, or total mortality have not been established.

‡ A patient-year represents the total time of exposure to LIPITOR as defined by the sum of each patient time on LIPITOR.[5]

¥ The Atorvastatin Versus Revascularization Treatments (AVERT) study examined the effect of intensive lipid-lowering in patients with stable coronary artery disease and LDL-C at least 3.0 mmol/L in patients referred for percutaneous transluminal coronary angioplasty (PTCA). Patients were randomized for 18 months to LIPITOR 80 mg daily or to PTCA with usual medical care which could include lipid metabolism regulators. The results of the AVERT study should be considered as exploratory since several limitations may affect its design and conduct. In the medical-treated group with LIPITOR there was a trend for a reduced incidence of ischemic events and a delayed time to first ischemic event. The results also suggest that intensive treatment to target LDL-C levels with LIPITOR is additive and complementary to angioplasty and would benefit patients referred for this procedure.[1]

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LIPITOR* atorvastatin calcium tablets

Dear Colleague:

On behalf of the Officers, Council and staff of the Canadian Society of Hospital Pharmacists, it is my pleasure to welcome you to CSHP's 35th Annual Professional Practice Conference.

The 2004 conference promises to be phenomenal. Over the last ten 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 2004 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.

Neil Johnson
CSHP President

Chers (ères) collègues,

Au nom de la Direction, du Conseil et du personnel de la Société canadienne des pharmaciens d'hôpitaux, je suis heureux de vous souhaiter la bienvenue à la 35e Conférence annuelle sur la pratique professionnelle de la SCPH.

La conférence 2004 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 intervenants de toutes les régions du pays. Nous espérons que vous pourrez tirer pleinement profit de ce que vous offre la Conférence de 2004 et que vous prendrez le temps de vous divertir.

Nous vous rappelons qu'au cours de cette conférence, la 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.

Neil Johnson
Président de la SCPH

CSHP Educational Services Committee
Le Comité des services éducatifs

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2003-2004
(At time of printing)

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Major Initiatives 2003/2004
Contributions importantes 2003/2004

CSHP is pleased to thank the following companies for their sponsorship of specific CSHP programs, services and events. The dollar value of these initiatives is included in the calculation of sponsorship levels.

Amgen Canada Inc.
PPC 2004 General Sponsorship

Apotex Inc.
CHPRB Matching Program

Bristol-Myers Squibb Canada
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AGM 2003 Satellite Symposium
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CSHP Awards 2003/2004 – CSHP's Highest Honours

Member Recognition Program

Apotex Inc.
Management Issues in Pharmaceutical Care
$1,500

Aventis Pharma
Specialty Practice in Cardiology
$1,500

Baxa Canada
Innovative Practitioner
$1,500

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$1,000

Bristol-Myers Squibb Canada Inc.
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$1,500

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Mayne Pharma (Canada) Inc.
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Long Term Health Care
$2,000

Pharmascience Inc.
Patient Care Enhancement
$1,000

Hoffmann-La Roche Ltd.
Specialties in Pharmacy Practice
$1,500

Isabel E. Stauffer Meritorious Service Award

(Presented by Pharmaceutical Partners of Canada) $1,500.00

Prolonged Service and Involvement in CSHP

(Individuals are nominated by their peers)

Past Winners

1986 Herbert A. Dixon
1986 A.W. Stanley Garvin
1987 Alan Samuelson
1988 D. Bryce Thompson
1989 Fred Rumpel
1990 Doris A. Thompson
1991 Louanne Twaites
1991 David Windross
1992 Cecilia Laskoski
1992 John Iazzetta
1993 No candidates this year
1994 Rosemary Bacovsky
1994 Roy A. Steeves
1995 Donna Pipa
1995 Kristina Wichman
1996 Dennis Leith
1996 Robert S. Nakagawa
1997 No candidates this year
1998 Larry Legare
1998 Emily Somers
1999 Kenneth McGregor
1999 Linda I. Poloway
2000 Kelly Babcock
2001 No candidates this year
2002 Margaret Colquhoun
2003 Margaret Gray

Ortho Distinguished Service Award

(Presented by Janssen-Ortho Inc.) $1,500.00

Outstanding Achievement in Hospital Pharmacy Practice

(Individuals are nominated by their peers)

Past Winners

1967 Michael J.V. Naylor
1968 Jacqueline McCarthy
1969 Isabel E. Stauffer
1970 Gordon Brown
1971 Paule Benfante
1972 Edwin J. Smith
1973 Leonard Gibson
1974 Anne O'Toole
1975 Muriel Hale
1976 Orest Buchko
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1978 Douglas J. Stewart
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2003/2004 Awards Program

Sincere appreciation is extended to the Awards Committee:

Chair

Susan Alderson

Committee Members

Carolee D. Awde-Sadler
Carolyn Boudreau
Lisa Dolovich
Mark Edlund
Paula MacDonald
Christine Wynne

and to our 2003/2004 Award Appraisers

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Régis Vaillancourt
Anne-Marie Whelan
Kerry Wilbur
Bill Wilson
Donna Woloschuk
Peter Zed
Sylvia Zerjav
Rosemary Zvonar

Aventis ad

Upcoming Events/ Événements à venir

Professional Practice Conference (PPC)
February 1 - 4, 2004
Sheraton Centre Toronto
Toronto, Ontario
Exhibits – yes
Attendance: 1000-1200

Professional Practice Conference (PPC)
February 5 - 9, 2005
Westin Harbour Castle
Toronto, Ontario
Exhibits – yes
Attendance: 1000-1200

Professional Practice Conference (PPC)
January 28 to February 1, 2006
Westin Harbour Castle
Toronto, Ontario
Exhibit – yes
Attendance: 1000-1200

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

Professional Practice Conference (PPC)
February 2 - 6, 2008
Westin Harbour Castle
Toronto, Ontario
Exhibits – yes
Attendance: 1000-1200

Professional Practice Conference (PPC)
January 31 to February 4, 2009
Westin Harbour Castle
Toronto, Ontario
Exhibits – yes
Attendance: 1000-1200

Annual General Meeting (AGM)
August 14 – 17, 2004
The Westin Edmonton
Edmonton, Alberta
Exhibits – yes
Attendance: 250-300

Annual General Meeting (AGM)
August 13 - 16, 2005
The Westin Ottawa
Ottawa, Ontario
Exhibits – yes
Attendance: 250-300

Annual General Meeting (AGM)
August 12 – 15, 2006
TBA
Montreal, Quebec
Exbibits – yes
Attendance: 250-300

Annual General Meeting (AGM)
August 11 – 14, 2007
TBA
Regina, Saskatchewan
Exhibits - yes
Attendance: 250-300

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

For further information, please contact Desarae Davidson, CSHP National Office.
Tel.: (613) 736-9733, ext. 229
Fax: (613) 736-5660
Email: ddavidson@cshp.ca

Continuing Education Credits/ Crédits de formation continue

Canadian Council on Continuing Education in Pharmacy
Conseil canadiene de l'education permanente en pharmacie

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 2004. 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 10 hospital pharmacists as well as 8 corresponding members from the CSHP branches.

Goal and objectives for the 2004 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 to Pharmacy Specialty Networks to meet

But et objectifs du programme de la CPP 2004

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.

PPC 2004 Registration Form

Sheraton Hotel, Toronto • Jan. 31-Feb. 4, 2004

Please complete the following form and send to CSHP by Friday, January 9, 2004. After this date, we request that you bring your registration form and payment with you to the conference. Please note early bird date of December 19, 2003.

Registration/Name Tag Information

Please print clearly.

CSHP Membership Number (printed on address label):

First Name: Initial: Last Name:

Title/Position:

Hospital/Organization:

Preferred Mailing Address: Business ❑ Home ❑

City: State/Province: Postal Code:

Telephone (W): Fax: Telephone (H):

Email (to ensure membership database is up-to-update):

Shared Registration

Please indicate name of registrants & day(s) attending.

Name(s)/Position(s) Day(s) attending

PPC Fees: Full Program and One-Day Programs

Includes all educational sessions, exhibits and luncheons.

	Full Program		Daily Rates	
	On/Before Dec 19/03	After/on site	On/Before Dec 19/03	After/on site
CSHP Member	$617.00	$699.30	$215.30	$242.00
Non-member	$776.80	$860.30	$271.00	$297.60
Shared Member	$707.80	$804.60	n/a	n/a
Non-member	$864.00	$964.30	n/a	n/a
Student Member	$223.80	$248.00	$55.60	$62.00
Non-member	$279.50	$305.00	$70.20	$76.20
AIT Member	$223.80	$248.00	$76.20	$82.30

If you have a serious food allergy, please specify:

Emergency Contact:

Workshop Options

These workshops are optional. Seating is limited. See program for workshop # and topics.

Afternoon Sessions

Sunday February 1	1 ❑	2 ❑	3 ❑	4 ❑	5 ❑
Monday February 2	1 ❑	2 ❑	3 ❑	4 ❑	5 ❑
Tuesday February 3	1 ❑	2 ❑	3 ❑	4 ❑	
Wednesday February 4	1 ❑	2 ❑	3 ❑	4 ❑	

Please indicate order of preference (1-4/5) in the boxes to the left. While every effort is made to accommodate first choices, we will proceed to assign you to your next indicated preference in the event of a full session.

Applicable Registration Fee: $_____

Add 7% GST (GST # R106866940): $_____

TOTAL ENCLOSED: $_____

❑ I am enclosing a cheque payable to the Canadian Society of Hospital Pharmacists (CSHP).

Please charge my ❑ VISA or ❑ MASTERCARD number:

Expiry Date: Signature of Cardholder:

PPC Registration and Fee Information

- Fees are payable to the Canadian Society of Hospital Pharmacists by cheque, VISA, American Express or MasterCard and MUST accompany this form. All fees are subject to 7% GST.
- CSHP accepts faxed registrations for those wishing to pay by credit card (in this case, please do not mail original form). To qualify for the early bird fees, registrations must be post-marked or faxed (with payment) on or before December 19, 2003. Cheques post-dated after this date will not be eligible for the early bird fee.
- PPC fees include CSHP awards program, luncheons on Monday and Tuesday, and all required course materials.
- The Research & Education Foundation Awards Dinner will be held on Monday, February 2, 2004.
- Career/Recruitment Evening will again be held on Sunday, February 1, 2004.
- Students are defined as undergraduate students. Graduate student members (including residents and Pharm.D. students) must register using the Active-In-Training fees. Non-members must register at the non-member fee.
- Early bird fees will apply to all accepted poster applicants.
- On site registration is available.

Shared Registration

- An institution may purchase a 4-day registration and use it for one individual ONLY per day. There are no shared registrations for undergraduate and graduate students.
- To qualify for the member rate, ALL of the individuals listed must be current CSHP members.
- The name of each registrant must be indicated on the application form (by day/s attending) and must be accompanied by payment in full.
- Individual name tags and on-site registration kits will be provided for each registrant. Tickets for luncheons will be included by day.

Cancellation Policy

Registrations may be cancelled in writing without penalty up to January 9, 2004. Late cancellations will be assessed an administration fee of $50.00. No refunds will be made after January 16, 2004. Individuals who wish to designate an alternate registrant for one or more of their days must first upgrade to a Shared Registration. Please note: There will be a $10.00 administration fee to transfer registrations.

Please return registrations to:

Canadian Society of Hospital Pharmacists
1145 Hunt Club Road, Suite 350
Ottawa, ON K1V 0Y3

For all Registration Enquiries, please contact Laurie Carquez at lcarquez@cshp.ca or by phone (613) 736-9733 ext. 226 and, for General Enquiries, please contact Desarae Davidson at ddavidson@cshp.ca or by phone (613) 736-9733 ext. 229.

Program/Programme

Saturday, January 31
Samedi le 31 janvier

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

Concourse Checkroom

17:00 **Ontario Branch Evening Social Event: Curling Bonspiel/Soirée organisée par la Section de l'Ontario : bonspiel de curling**

High Park Curling Club

Sunday, February 1
Dimanche le 1er février

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

Concourse Checkroom

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

Grand Ballroom East

09:00 – 10:00 **Drug-Related Hospital Visits: How Big is the Problem?**

Grand Ballroom East

Peter Zed, PharmD
Vancouver General Hospital
Vancouver, BC

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

Grand Ballroom Foyer

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

1. **Pharmacist's Role in the Pre-Admission Clinic**

   Conference Room B&C

   Catharine Banks, BSc, BScPharm
   Red Deer Regional Hospital
   Red Deer, AB

2. **Direct Thrombin Inhibitors**

   Dominion Ballroom North

   Stephanie Young, PharmD
   Health Care Corporation of St. John's
   St. John's, NL

3. **Pharmacist Office-Based Patient Care Practice: From Independence to Collaboration**

   Dominion Ballroom South

   Shallen Letwin, PharmD
   Fraser Health Authority – MSA
   Abbotsford, BC

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

1. **Medical Myths**

   Conference Room B&C

   a. **Glyburide Administration Before or with Meals**

      Henry Halapy, PharmD
      St. Michael's Hospital
      Toronto, ON

   b. **Metolazone and Furosemide: Is There A "Right Administration Time"?**

      Toni Bailie, BScPhm
      Mount Sinai Hospital
      Toronto, ON

   c. **Coxibs: The GI Files**

      Susan Karakashian, BScPharm
      Toronto East General Hospital
      Toronto, ON

2. **Multiple Sclerosis and Neuropathic Pain**

   Dominion Ballroom North

   Mike Namaka, BScPharm, MScPharm, PhD
   University of Manitoba
   Winnipeg, MB

3. **Guidelines on the Role of the Home Health Care Pharmacists, Canadian Society of Hospital Pharmacists**

   Dominion Ballroom South

   Doris Nessim, BScPhm, MA
   Consultant, Mississauga, ON

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

a. **Current Canadian Hypertension Guidelines, What are the Roles of the Pharmacist?**

   Grand Ballroom Centre

   Hosted by Canadian Cardiovascular Pharmacists Network on behalf of Pfizer Canada Inc.

b. **Innovation in the Treatment of Community-Acquired Intra-Abdominal Infections**

   Grand Ballroom West

   Hosted by Merck Frosst Canada Ltd.

c. **Postoperative Nausea and Vomiting: In Search of a Rational Approach**

   Civic Ballroom

   Hosted by GlaxoSmithKline Inc.

d. **The Best Line of Defense: Reducing the Risk of Stroke in Hypertensive Patients**

   Essex Ballroom

   Hosted by Merck Frosst Canada Ltd.

14:10 – 14:55 **Pharmacists Prescribing – Panel**

Grand Ballroom East

Glen Pearson, PharmD, FCSHP – Moderator
University of Alberta, Edmonton, AB

Robin Ensom, PharmD, FCSHP
Providence Healthcare, Vancouver, BC

Kathy Vu, BScPhm
St. Michael's Hospital, Toronto, ON

15:00 – 17:00 Workshops/Ateliers

1. Clinical Statistics 101

Conference Room B&C

Muhammad Mamdani, PharmD, MA, MPH
Institute for Clinical Evaluative Sciences
Toronto, ON

2. Applying Engineering Principles to Medication Safety-Making Sense of HFE, FMEA and RCA

Dominion Ballroom South

Sylvia Hyland, BScPhm
Toronto Western Hospital, University Health Network/ISMP Canada
Toronto, ON

Marg Colquhoun, BScPhm, FCSHP
Markham Stouffville Hospital/ ISMP Canada
Markham, ON

Valentina Jelincic, BScPhm
Validus Consulting Inc./ISMP Canada
Toronto, ON

3. Physical Assessment – Cardiovascular System

Conference Room D&E (max. 30)

Glen Pearson, PharmD, FCSHP
University of Alberta
Edmonton, AB

4. Pharmacokinetic Monitoring Pearls for the Clinical Pharmacists: Focus on Aminoglycosides, Vancomycin and Phenytoin

City Hall Room

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

Elaine Chong, PharmD
Virtual Learning Inc.
Toronto, ON

5. Writing Effective Learning Objectives

Essex Ballroom

Donna Woloschuk, PharmD, FCSHP
Winnipeg Regional Health Authority
Winnipeg, MB

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

Medications and Falls in the Elderly

Dominion Ballroom North

Barbara Farrell, PharmD
SCO Health Service
Ottawa, ON

Cheryl Wiens, PharmD
University of Alberta
Edmonton, AB

17:00 – 18:00 Coffee and Chat/Café et causette

V.I.P. Room

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

Civic Foyer & Ballroom

Monday, February 2
Lundi le 2 février

06:15 – 08:15 Satellite Symposiums (breakfast included)/Symposiums satellites (petit déjeuner inclus)

a. Clinical Study Review: The Registry on Upper Gastrointestinal Bleeding and Endoscopy (RUGBE)

Grand Ballroom Centre

Hosted by Altana Pharma Inc.

b. New Developments in Lipid Management

Grand Ballroom West

Hosted by Merck Frosst/Schering Pharmaceuticals

07:30 – 17:00 Registration/Inscription

Concourse Checkroom

08:30 – 09:30 The Canadian Adverse Events Study

Grand Ballroom East

G. Ross Baker, PhD
University of Toronto
Toronto, ON

09:30 – 10:15 Assessment of Health Technologies for the Prevention of Medication Errors in the Hospital Setting

Grand Ballroom East

Michel Boucher, BPharm, MSc
Canadian Coordinating Office for Health Technology Assessment
Ottawa, ON

David U, BScPhm, MScPhm
ISMP Canada
Toronto, ON

10:15 – 10:45 Break/Exhibits/Posters/ Pause/Kiosques/Affiches

Sheraton Hall & Vide

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

1. Early Career Development for Pharmacists

Conference Room B&C

Elaine Tom, BScPhm
St. Michael's Hospital
Toronto, ON

2. Upper Gastrointestinal Bleeding Peptic Ulcer Disease: Pharmaco-therapy Issues in Acute Management and Secondary Prevention

Dominion Ballroom North

Peter Zed, PharmD
Vancouver General Hospital
Vancouver, BC

3. Acute Ischemic Stroke: A Practical Approach to Management, with an Ounce of Prevention

Dominion Ballroom South

Peter Loewen, PharmD
Vancouver Hospital & Health Sciences Centre
Vancouver, BC

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

1. Award-Winning Presentations/
Présentations par les gagnants des prix

Presentations 1

York Room

Presentations 2

Peel Room

Presentations 3

Norfolk Room

2. Roundtables/Tables rondes

a. Preparing and Managing Pre-Printed Orders/Guidelines

Windsor East

Carlo DeAngelis, PharmD
Sunnybrook and Women's College HSC
Toronto, ON

b. ER – Opportunities and Challenges

Peter Zed, PharmD
Vancouver General Hospital
Vancouver, BC

Payal Patel, PharmD
London Health Sciences Centre
London, ON

c. Beyond BScPhm

Windsor West

Marissa Battistella, PharmD
Toronto General Hospital, University Health Network
Toronto, ON

Artemis Diamantouros, BScPhm, MEd
Sunnybrook and Women's College HSC
Toronto,ON

d. Warfarin Clinic

Bill Bartle, PharmD, FCSHP
Sunnybrook and Women's College HSC
Toronto, ON

Carmine Stumpo, PharmD
Toronto East General Hospital
Toronto, ON

12:30 – 13:45 **Awards Luncheon/**
Déjeuner de remise des prix

Grand Ballroom Centre/West

13:45 – 15:00 **Exhibits/Posters/Kiosques/Affiches**

Sheraton Hall & Vide

15:00 – 17:00 **Workshops/Ateliers**

1. Clinical Stats 101

Conference Room B&C

Muhammad Mamdani, PharmD, MA, MPH
Institute for Clinical Evaluative Sciences
Toronto, ON

2. Applying Engineering Principles to Medication Safety – Making Sense of HFE, FMEA and RCA

Civic Ballroom

Sylvia Hyland, BScPhm
Toronto Western Hospital – University Health Network/ISMP Canada
Toronto, ON

Marg Colquhoun, BScPhm, FCSHP
Markham Stouffville Hospital/
ISMP Canada
Markham, ON

Valentina Jelincic, BScPhm
Validus Consulting Inc./ISMP Canada
Toronto, ON

3. Physical Assessment – Cardiovascular System

Conference Room D&E (max. 30)

Glen Pearson, PharmD, FCSHP
University of Alberta
Edmonton, AB

4. Pharmacokinetic Monitoring Pearls for the Clinical Pharmacists: Focus on Aminoglycosides, Vancomycin and Phenytoin

City Hall Room

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

Elaine Chong, PharmD
Virtual Learning Inc.
Toronto, ON

5. Writing Effective Learning Objectives

Essex Ballroom

Donna Woloschuk, PharmD, FCSHP
Winnipeg Regional Health Authority
Winnipeg, MB

15:00 – 17:00 **PSN Session – Psychiatry/**
Session RSP – Psychiatrie

Windsor East/West

Clinical Practice Guidelines for Despressive Disorders

Albert Chaiet, BScPhm, MSPhm, MBA
Centre for Addiction and Mental Health
Toronto, ON

Anxious about Anxiety? A Review of Treatment Guidelines

Adil Virani, PharmD
IWK Health Centre
Halifax, NS

18:00 – 21:00 **Research and Education Foundation Fundraising Dinner/**
Fondation pour la recherche et l'éducation
Dîner pour la collecte de fonds

Dominion Ballroom & Foyer

Tuesday, February 3
Mardi le 3 février

06:15 – 08:15 **Satellite Symposiums (breakfast included)/Symposiums satellites (petit déjeuner inclus)**

a. Optimal Use of the Fluoroquinolones – Improve Outcomes and Reduce Resistance

Grand Ballroom Centre

Hosted by Bayer Inc.

b. Serious Infections in Hospital Settings

Grand Ballroom West

Hosted by AstraZeneca Canada Inc.

07:30 – 17:00 Registration/Inscription

Concourse Checkroom

08:30 –09:30 Disaster-Pandemic Planning

Grand Ballroom East

Bonnie Henry, MD
Toronto Public Health
Toronto, ON

09:30 – 10:15 Advocacy: Finding Your Voice

Grand Ballroom East

Marlo Palko
Fleishman-Hillard
Toronto, ON

10:15 – 10:45 Break/Exhibits/Pause/Kiosques

10:45 – 11:30 Concurrent Session/ Sessions concomitantes

1. Adjunctive Endocrine Therapies in Sepsis – Beyond Antibiotics

Conference Room B&C

Doson Chua, PharmD
Fraser Health Authority
Abbotsford, BC

2. Clinical Trials That May Change Your Practice in General Medicine

Dominion Ballroom North

Olavo Fernandes, PharmD
Toronto General Hospital, University Health Network
Toronto, ON

3. Cardiovascular Risk and Renal Disease – An Unrecognized Problem

Dominion Ballroom South

Colette Raymond, PharmD
Winnipeg Regional Health Authority
Winnipeg, MB

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

1. Award-Winning Presentations/ Présentations par les lauréats

Presentations 1

York Room

Presentations 2

Peel Room

Presentations 3

Norfolk Room

2. Roundtables/Tables rondes

a. Insulin Sliding Scale Protocols

Wentworth

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

b. Activated Protein C (APC) – One Year Later

Sharon Yamashita, PharmD, FCSHP
Sunnybrook and Women's College HSC
Toronto, ON

c. Computerized Physician Order Entry (CPOE)

Windsor West

Donna Lowe, BScPhm
Toronto General Hospital, University Health Network
Toronto, ON

Monique Pitre, BScPharm
University Health Network
Toronto, ON

d. Systemic Fungal Infections/Antifungal Agents

Gary Wong, BScPhm
Toronto General Hospital, University Health Network
Toronto, ON

12:30 – 13:45 Awards Luncheon/ Déjeuner de remise des prix

Grand Ballroom Centre/West

13:45 – 15:00 Exhibits/Posters/Kiosques/Affiches

Sheraton Hall & Vide

15:00 –17:00 Workshops/Ateliers

1. Pharmacotherapeutic Approach to Acute Renal Failure

Conference Room B&C

Sean Gorman, PharmD
Vancouver General Hospital
Vancouver, BC

2. Managing Side Effects of HIV Drugs

Civic Ballroom

Dylanna Arsenault-Thompkins, PharmD
Toronto General Hospital, University Health Network
Toronto, ON

3. Adult TPN: A Refresher Course

Dominion Ballroom North

Diane Baldwin, BScPharm
McKesson Medication Management Consultant
Rothesay, NB

4. Wound Management

Windsor East/West

Louanne Rich-vanderBij, MSc, CWCN, COCN
Sunnybrook and Women's College HSC
Toronto, ON

15:00 – 17:00 PSN Session – ID/ Session RSP – Infectiologie

Essex Ballroom

Management of Pneumocystis Jivoveci Pneumonia (PJP) in the HIV-Infected Population after Trimethoprim – Sulfamethoxazole (TMP/SMX) Failure

Nancy Sheehan, BPharm, MSc
McGill University Health Centre
Montreal, QC

Drug Interactions for Antiretroviral Drugs: Mechanism and Clinical Implications

Rolf van Heeswijk, PharmD, PhD
The Ottawa Hospital
Ottawa, ON

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

City Hall Room

Empiric Management of Invasive Fungal Infections for Febrile Neutropenic Patients: Past, Present and Future

Hosted by Merck Frosst Canada Ltd.

Wednesday, February 4
Mercredi le 4 février

06:15 – 08:15 **Satellite Symposium (breakfast included)**
Symposiums satellites (petit déjeuner inclus)

Grand Ballroom West

Managing Acute Agitation: Considerations Beyond the Emergency Room

Hosted by Eli Lilly Canada Inc.

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

Concourse Checkroom

08:30 – 9:30 **Pharmacokinetic and Pharmacodynamic Aspects of Space Flight**

Grand Ballroom East

Eleanor O. Rangers, PharmD
AstraZeneca
Lawrenceville, NJ

09:30 – 10:15 **Oncology Pharmacogenomics: The Future is Now**

Grand Ballroom East

Jill Kolesar, PharmD, FCCP, BCPS
University of Wisconsin
Madison, WI

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

Grand Ballroom Foyer

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

1. Update on Oncology Agents

Conference Room B&C

a. Update on Breast Cancer

Pamela Ng, BScPhm
Princess Margaret Hospital
Toronto, ON

b. Update on Lung Cancer

Wayne Cotrell, BScPhm
Princess Margaret Hospital
Toronto, ON

c. Update on Colorectal Cancer

Amrita Daftary, BScPhm
Princess Margaret Hospital
Toronto, ON

2. Establishing Emergency Medicine Clinical Pharmacy Services

Dominion Ballroom North

Payal Patel, PharmD
London Health Sciences Centre
London, ON

3. Power Pointers: Tips on Using Powerpoint, to Create and Deliver Effective Presentations

Dominion Ballroom South

Mohammad Zuberi, BScPhm
Toronto General Hospital, University Health Network
Toronto, ON

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

1. Issues on Paediatric Oncology

Dominion Ballroom North

a. Research as the Standard of Care

Lee Dupuis, MScPhm, FCSHP
The Hospital for Sick Children
Toronto, ON

b. Guidelines for the Appropriate Use of Rasburicase

Jennifer Drynan-Arsenault, BScPhm
The Hospital for Sick Children
Toronto, ON

c. Preventon of Long-Term Sequelae – Osteoporosis

Marjana Chionglo, BScPhm
The Hospital for Sick Children
Toronto, ON

2. Management of Drug-Induced Osteoporosis

Dominion Ballroom South

Anne Marie Whelan, PharmD
Dalhousie University
Halifax, NS

3. Practical Applications of the Canadian Diabetes Management Guidelines

Conference Room B&C

Christine Papoushek, PharmD
Toronto Western Hospital, University Health Network
Toronto, ON

12:35 – 14:15 **Satellite Symposiums (luncheon included)/**
Symposiums satellites (déjeuner inclus)

a. Optimizing Long-Term Combination Antiplatelet Therapy in Patients with Atherothrombosis

Grand Ballroom Centre

Hosted by Canadian Cardiovascular Pharmacists Network on behalf of Sanofi-Synthelabo Canada Inc. & Bristol-Myers Squibb Canada

b. Nocturnal Hemodialysis

Grand Ballroom West

Hosted by Renal Pharmacists Network on behalf of Ortho Biotech

14:15 – 15:00 **What, Me Conflicted? Doctors and the Pharmaceutical Industry**

Grand Ballroom East

Joel Lexchin, MD, CCFP(EM), DABEM
York University, University Health Network
Toronto, ON

15:00 –17:00 **Workshops/Ateliers**

1. Pharmacotherapeutic Approach to Aute Renal Failure

Conference Room B&C

Sean Gorman, PharmD
Vancouver General Hospital
Vancouver, BC

2. Managing Side Effects of HIV Drugs

Civic Ballroom

Dylanna Arsenault-Thompkins, PharmD
Toronto General Hospital, University Health Network
Toronto, ON

3. Adult TPN: A Refresher Course: Current Recommended Practice

Dominion Ballroom North

Diane Baldwin, BScPharm
Mckesson Medication Management Consultant
Rothesay, NB

4. Wound Management

Simcoe/Dufferin

Louanne Rich-vanderBij, MSc, CWCN, COCN
Sunnybrook and Women's College HSC
Toronto, ON

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

Essex Ballroom

Oral Anticoagulation Therapy: Past, Present and Future

Jack Ansell, MD
Boston University Medical Center
Boston, MA

Drug Eluting Stents and the Pharmacist

Uche Genus, BScPhm
Toronto General Hospital
Toronto, ON

CHF 2004 Update

Swasti Bhajan Mathur, BScPhm
Rouge Valley Health System
Toronto, ON

What's New in Peripheral Arterial Disease "PAD"? Hint: Another Silent Killer in the Deadly Triad

Wendy Leong, PharmD, MBA, BCCPS
Burnaby Research Inc.
Burnaby, BC

17:00 **Close of the 35th Professional Practice Conference/ Clôture de la 35e Conférence annuelle sur la pratique professionnelle**

Sunday, February 1 • Dimanche le 1er février

Drug-Related Hospital Visits: How Big Is the Problem?

Peter J. Zed, B.Sc., B.Sc.(Pharm), Pharm.D., Pharmacotherapeutic Specialist – Emergency Medicine, CSU Pharmaceutical Sciences, Vancouver General Hospital, Clinical Assistant Professor, Faculty of Pharmaceutical Sciences & Associate Member, Department of Surgery, Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada

Abstract

Drugs are prescribed for patients with various medical conditions to achieve an optimal therapeutic outcome. When the outcome is not optimal, a drug-related problem (DRP) has occurred. Although many drug-related problems can be resolved without a major impact on patient health, some can be associated with significant morbidity and mortality. It has been estimated that approximately 5% of all hospital admissions are drug-related and 50% are avoidable. Although several reports over the past few years on the impact of drug-related hospitalizations have focused on adverse drug reactions (ADR), this represents only one of the eight classes of DRPs. Thus, impact of each of the eight classes of potential DRPs are likely much higher than those described for ADRs alone, and has not been accurately quantified.

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 discussing how many of these could have been prevented. Finally, strategies 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?

Pharmacist's Role in a Pre-Admission Clinic

Catharine Banks, BSc. Pharm, David Thompson Health Region, Red Deer, AB.

This discussion will highlight the benefits of pharmacist involvement in a surgical pre-admission clinic (PAC) and provide pharmacists with an understanding of the unique role of the pre-admission clinic pharmacist.

Surgical nursing units tend to be bustling with activity relating to urgent needs such as pain control and the management of nausea and vomiting. Due to the acute nature of patient needs on surgical units, an area of patient care that receives less attention is the continuity of home medication regimens. Our PAC pharmacists have developed a "Home Medication Reorder Form" that is completed by the pharmacist prior to admission for elective surgeries. The development and use of this form by nursing, pharmacists, and physicians will be discussed.

The role of the PAC pharmacist has evolved to include complete patient chart reviews prior to admission, allowing for the identification of patients at high risk for surgical complications and/or patients at risk of experiencing drug related problems. As a result of the pre-admission chart review, the PAC pharmacist will provide "pre-admission counselling" where needed and pharmaceutical care where it is most needed on admission. The PAC pharmacist position is new at the Red Deer Regional Hospital Centre. This session will include a brief discussion of the strategic planning process involved in developing this new role and plans for further development.

Goals and Objectives

1. To provide pharmacists with an understanding of the role of the pre-admission clinic pharmacist.

2. To provide pharmacists with an understanding of the impact of the PAC pharmacist on drug distribution and patient care.
3. To provide pharmacists with a basic understanding of the process involved in developing a PAC pharmacist program.

Self-Assessment Questions

1. Discuss the impact of the Home Medication Re-order Form and the PAC pharmacist on drug distribution at Red Deer Regional Hospital Centre.
2. Describe the process involved in developing a PAC pharmacist position.

Direct Thrombin Inhibitors

Stephanie Young, BSc(Pharm), Pharm.D., Health Care Corporation of St. John's, St. John's, NL

The goal of this presentation is to review the new class of antithrombotic agents, the direct thrombin inhibitors (DTIs), with a focus on cardiovascular related evidence.

Anticoagulation therapy with the traditional standard of unfractionated heparin (UFH) and warfarin has been hindered by the complexities of dosing, need for frequent monitoring, and risks of bleeding. To overcome these deficiencies, newer agents such as the direct thrombin inhibitors (DTIs) have been developed. In comparison to UFH, the DTIs affect a different part of the coagulation cascade. As well, this new class inhibits both soluble and clot-bound fibrin, compared to UFH's ability to inhibit soluble fibrin only.

There are several parenteral DTIs currently available: lepirudin (approved for treatment of heparin-induced thrombocytopenia), bivalirudin (approved for use in percutaneous coronary intervention), and argatroban (not available in Canada). Trial data is also available for these agents in other cardiovascular areas such as acute coronary syndrome.

Another DTI under development, ximelagatran, is orally bioavailable. It has been studied primarily as an alternative to warfarin, with the advantage that monitoring is not required. Evidence includes studies of venous thromboembolism prophylaxis post orthopedic surgery, secondary prophylaxis post myocardial infarction, and thromboembolism prophylaxis in patients with non-valvular atrial fibrillation.

These agents have potential advantages over standard anticoagulation therapy. However, heterogenicity appears to exist regarding efficacy and bleeding risks across the agents. Thus, their role in the management of many thrombotic disorders will become more defined as additional evidence accumulates.

Goals and Objectives

1. To become familiar with the direct thrombin inhibitor agents available or under investigation.
2. To review the current evidence for the use of direct thombin inhibitors, with a focus on cardiovascular related data.

Self-Assessment Questions

1. What are the advantages of direct thrombin inhibitors over standard anticoagulants such as unfractionated heparin?
2. What is the role of direct thrombin inhibitors in cardiovascular disease?

Glyburide Administration With Or Before Meals?

Henry Halapy, BSc Phm, PharmD,
St. Michael's Hospital, Toronto, Ontario

Glyburide is historically often dosed 15-30 minutes prior to meals, a regimen that can be cumbersome for patients. The goal of this session is to therefore discuss the administration timing of glyburide in relation to meal intake by patients.

This talk will explore the historical reasons for the traditional dosing regimen of glyburide, which centers on extrapolations of the pharmacokinetics of glyburide and dosing experiences with some older first generation sulfonylureas. Some of the older sulfonylurea agents tended to have a quicker onset of action or more propensities to cause hypoglycemia. It will also be reviewed that differences between the pharmacokinetics and pharmacodynamics of different sulfonylureas (glyburide in particular) and non-sulfonylurea secretagogue agents make strict before meal dosing less important with glyburide. These particular differences include glyburide's longer half-life and lack of ability to restore the first phase of insulin secretion.

However, use of all sulfonylureas, including glyburide, can lead to the main side of hypoglycemia due to their similar mechanism of action. Risk factors for hypoglycemia include elderly age, worsening renal function, and erratic eating habits. This suggests that regular food intake is still essential in preventing

hypoglycemia, particularly with longer acting agents such as glyburide.

Goals and Objectives

1. To discuss the evidence around the timing of glyburide administration with respect to food.
2. To allow the pharmacist to better make patient care and practice recommendations around the issue of the timing of glyburide administration.

Self-Assessment Questions

1. What factors should be considered when evaluating an appropriate administration time for glyburide?
2. What counseling advice could patients taking glyburide be told regarding the administration of the glyburide?

Metolazone and Furosemide: Is There a "Right Administration Time"?

Toni Bailie, BScPhm, Mount Sinai Hospital, Toronto, ON

Diuretic resistance is encountered in a number of disease states such as chronic renal failure, nephrotic syndrome, congestive heart failure and cirrhosis. One common strategem to maximize diuretic response is to combine diuretics of different classes. The effectiveness of combining furosemide, a loop diuretic, and metolazone, a thiazide diuretic, has been described in several studies. Furosemide acts to block sodium reabsorption in the ascending limb of the loop of Henle. During chronic therapy this repeatedly exposes the distal tubular cells to higher sodium chloride concentrations. Over time the distal tubular cells increase their sodium transport capacity. This leads to 'diuretic resistance'. Adding a diuretic which acts at the distal tubule, such as metolazone, blocks this sodium transport and restores an effective diuresis. Metolazone itself is erratically absorbed. Its absorption profile in healthy volunteers displays substantial interindividual variability. In these studies, t-max values for metolazone were approxiamately 7.5 hours. Consequently, achieving adequate systemic concentrations to effect synergy with furosemide may require multiple doses—several hours to days—before the effect of the drug is fully manifested. When using this combination on a regular basis, the metolazone, then, can be given most any time of day.

Goals and Objectives

1. To review the pharmacokinetic and pharmacodynamic factors which impact the diuretic combination of metolazone and furosemide.
2. To provide recommendations for implementation of this combination therapy for inpatients and outpatients.

Self-Assessment Questions

1. What is a plausible physiologic explanation for the synergistic diuretic response between metolazone and furosemide?
2. How would you counsel a patient being discharged on metolazone and furosemide?

COXIBS: The GI Files

Susan Karakashian, B.Sc.Pharm, Toronto East General & Orthopaedic Hospital, Toronto, ON

While the medical literature is filled with evidence showing coxibs to be less gastrotoxic than traditional NSAIDS, comparisons of gastrointestinal outcomes with the coxibs versus non-NSAID controls have not been addressed as thoroughly. Recent studies have attempted to speak to this deficit by reporting outcomes favouring the coxibs over placebo.

Despite the proven relative gastrointestinal safety of coxibs, several cases of gastrointestinal bleeding in patients using celecoxib and rofecoxib have been described. Risk factors predisposing patients to these events require careful management to minimze risk. In addition to the more common risk factors, it has been suggested that concurrent use of ASA with coxibs may increase the risk of gastrotoxicity. The medical literature examining this hypothesis will be reviewed.

Furthermore, lower GI effects of the coxibs should be considered. While they are not likely to cause ulceration, some authors suggest that coxibs may interfere with the repair of traditional NSAID-induced gastropathy or delay healing of ulcerative colitis lesions.

As practitioners, we should realize that, despite lower rates of upper gastrointestinal effects with the coxibs, they can still occur. In order to optimize patient selection and treatment with coxibs we should engage in careful risk assessment.

Goals and Objectives

1. To identify and review cases of gastrointestinal side effects with COX 2 inhibitors

2. To review risk factors that deem patients more likely to develop gastrointestinal side effects with NSAIDS in order to provide pharmacists with ways to optimize patient selection for treatment with COX 2 inhibitors

Self-Assessment Questions:

1. What relevant risk factors would influence the decision to treat with a coxib versus a traditional NSAID?
2. What are some of the less known adverse gastrointestinal effects patients may experience with coxibs?

Multiple Sclerosis and Neuropathic Pain

Michael P. Namaka BSc Pharm, MSc Pharm, Ph D, Assistant Professor, Faculty of Pharmacy, University of Manitoba

The general goal of this session is to provide pharmacists with a better understanding of multiple sclerosis and neuropathic pain. Multiple Sclerosis (MS) is a chronic demyelinating disease of the central nervous system (CNS). The pathology of MS involves autoimmunity. Inflammatory CD4+ Th1 cells become activated in the periphery and cross the blood brain barrier where they exert damaging effects to the myelin producing oligodendrocytes. The net result is a vast array of disease-induced clinical symptoms that directly impact quality of life. At present, there is no cure, however, immunomodulatory treatment strategies have been developed to slow the progression of disease by decreasing the number and severity of attacks. Clinical definitive diagnosis and immunomodulatory treatment selection will be discussed. In terms of MS-induced symptoms, neuropathic pain has been reported to be the second worst symptom suffered by MS patients. Characteristic clinical presentation includes: the feeling of numbness, burning, tingling and/or stabbing pain. A newly developed treatment algorithm for neuropathic pain will discuss the logical and sequential use of numerous drugs from several drug classes. Understanding the various treatment options presented in the algorithm will promote pharmacists to the forefront of symptomatic management of neuropathic pain.

Goals and Objectives

Part A:

- Understand the pathophysiology of multiple sclerosis
- Recognize the prevalence and trigger factors of the disease
- Recognize the different types of multiple sclerosis
- Identify the clinical criteria for diagnosis
- Recognize the different treatment options available for relapsing remitting multiple sclerosis

Part B:

- Identify the various disease-induced symptoms of multiple sclerosis
- Understand the pain processing loop
- Recognize the clinical presentation of neuropathic pain
- Apply a treatment algorithm of neuropathic pain
- Understand the relevance of the treatment algorithm

Self-Assessment Questions

1. What clinical criteria is used to diagnose a patient with relapsing remitting multiple sclerosis?
2. How do antiepileptic drugs differ from tricyclic antidepressants in terms of their mechanism of action for relieving neuropathic pain?
3. What are the proposed benefits in following a treatment algorithm for neuropathic pain?

Guidelines on the Role of the Home Health Care Pharmacist, Canadian Society of Hospital Pharmacists.

Doris Nessim, Chair, Home Health Care Task Force.

The Canadian Society of Hospital Pharmacists' Home Health Care Task Force was charged with developing Guidelines on the Role of the Home Health Care Pharmacist ('Guidelines'). The Home Health Care Task Force comprises interdisciplinary representation from hospital, community, home health care, and academic affiliations. The DRAFT version of the Guidelines, which are scheduled for completion in 2004, significantly expand upon the original CSHP Statement (1998) on the Role of the Home Care Pharmacist, with new content supporting the interrelationship with CSHP's work in the areas of seamless care as well as work in establishing strong medication safety practices as well as the value of pharmacist directed research. To increase the opportunity for feedback, the DRAFT version of the Guidelines will be presented to membership during the Professional Practice Conference, 2004. The

presentation will include a review of material from sections of the Guidelines addressing provision of pharmacist services for home health care services for patients transitioning from hospital to home, such as pharmacists' assessment of the home care patient; development of the care plan; follow-up and monitoring of the home care patient; documentation and communication with the patient, patient's informal and formal care providers; medication distribution services, quality assurance activities, and medication safety and research.

Goals and Objectives

1. Explain the current status of the provision of home health care services in Canada.
2. Explain the key roles played by Government, home health care agencies, and various health disciplines associated with home health care services.
3. Discuss some of the issues facing provision of home health care services by pharmacists.
4. Describe the Task Force membership and the process supporting the development of the Guidelines on the Role of the Home Health Care Pharmacist.
5. Describe the process for obtaining membership feedback to the (draft) Guidelines on the Role of the Home Health Care Pharmacist and the plan for providing the (final) Guidelines to CSHP members.

Self-Assessment Questions

1. Determine the issues (e.g., those considered by the Home Health Care Task Force) when considering provision of home health care services by pharmacists.
2. Determine the interrelationships that need to be recognized for successful provision of home health care services
3. Identify the factors to be considered, key required competencies, and areas of responsibilities associated with the provision of home health care services by the pharmacist.

Clinical Statistics 101

Muhammad Mamdani, PharmD, MA, MPH

The goal of this session is to provide pharmacists with a basic understanding of clinical research design and the role of statistics in evaluating and interpreting findings from clinical studies. This session is intended for individuals with a basic to intermediate level of understanding of research design and statistical concepts as they apply to clinical research.

In this era of evidence-based medicine, the healthcare community is inundated with research upon which to base clinical practice. A thorough understanding the available evidence and its limitations is crucial in providing optimal patient care. However, the interpretation of the numerical findings from clinical research is often difficult and application of the findings to clinical practice is often uncertain. A basic understanding of research study design and the statistical tools commonly used to analyze data are crucial for appropriate interpretation of the available evidence and optimal application to clinical practice.

Several important methodological and statistical concepts will be reviewed in this presentation through a research framework with some participant interaction. Practical examples will be used throughout the presentation to facilitate real world application.

Goals and Objectives

1. To review the purpose and types of clinical research studies in the context of clinical outcomes.
2. To review the basic statistical tests commonly used in the medical literature.
3. To understand the relationship between study design, data collection, statistical analysis, and clinical interpretation.

Self-Assessment Questions

1. Was the appropriate statistical analysis used to evaluate the findings of a particular clinical research study?
2. What do the results of the statistical analysis really mean and how can I apply them to 'real world' clinical practice?

Applying Engineering Principles to Medication Safety – Making Sense of HFE, FMEA and RCA

Sylvia Hyland, BScPhm, Marg Colquhoun, BScPhm, FCSHP, Valentina Jelincic, BScPhm, ISMP Canada

This workshop will introduce the concepts and applications of Human Factors Engineering (HFE), Failure Mode and Effects Analysis (FMEA) and Root Cause Analysis (RCA) in operational and clinical medication use systems.

Goals and Objectives

- Explain the meaning of HFE, FMEA and RCA;
- Explain the steps and tools used for HFE, FMEA and RCA; and
- Apply these engineering principles to sample cases.

Healthcare lags behind other industries in designing systems that ensure safety. Understanding and using these practical approaches will help pharmacists lead safety initiatives in their institutions.

Self-Assessment Questions

1. How would I explain to my colleagues the application of engineering principles to medication safety?
2. How can I apply these tools to make changes in my workplace for the enhancement of patient safety?

Physical Assessment – Cardiovascular System

Glen J. Pearson, BScPhm, PharmD, FCSHP, Division of Cardiology, University of Alberta, Edmonton, AB

The role of the pharmacist has become increasingly patient-oriented over the last few decades. More recently, new visions of health delivery have been introduced in Canada and embraced by pharmacists who are assuming increasing responsibility for the optimization of patient drug therapy outcomes and expanding their scope of practice. Pharmacists functioning in these expanded roles require patient and physical assessment skills, which have not traditionally been a component of pharmacy practice. While a physician's physical assessment is frequently used to determine the patient's diagnosis, a pharmacist's physical assessment usually serves a different purpose. Pharmacists use patient physical assessment skills to gather important clinical data to aid in their recommendations for pharmacotherapy and to evaluate drug therapy outcomes in patients.

The primary purpose of this workshop is to introduce pharmacy practitioners to the art and science of physical assessment of the cardiovascular system and to provide participants with examples of how cardiovascular physical assessment can be applied in the evaluation of drug therapy outcomes. During the workshop pharmacists will have the opportunity to practice four primary physical assessment techniques, as they apply to the cardiovascular system: inspection, palpation, percussion and auscultation.

Goals and Objectives

1. Introduce pharmacy practitioners to the art and science of physical assessment of the cardiovascular system.
2. Provide examples of how cardiovascular physical assessment can be applied by pharmacists in the evaluation of drug therapy outcomes.

Self-Assessment Questions

1. Identify the areas of auscultation of the heart and describe the expected sounds for each area.
2. Describe the qualities of abnormal heart sounds.
3. Develop a plan to practice and refine your cardiovascular physical assessment skills with real patients in your own clinical practice environment.

Pharmacokinetic Monitoring Pearls for the Clinical Pharmacist: Focus on Aminoglycosides, Vancomycin and Phenytoin

Elaine Chong, BSc(Pharm), PharmD, Virtual Learning Inc.; Toronto, ON

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

The interpretation of imperfect data is one of the challenges of clinical pharmacokinetic monitoring. The equations and theorems used to guide our pharmacokinetic assessment of the patient often assume perfection, while the practicing clinician is faced with many discrepancies from dose to dose, drug to drug, and even institution to institution.

The goals and objectives of this presentation are to provide clinical pharmacists with a practical approach to pharmacokinetic monitoring, with an emphasis on the relevance of utilizing imperfect data. Through the illustration of three commonly-encountered pharmacokinetic monitoring scenarios, the clinical pharmacist will be guided to appropriately interpret drug concentrations obtained during each situation.

In the first scenario, the aminoglycosides will be used as a prototype to highlight the effect of changing dosing intervals. The use of steady-

state equations for calculation of pharmacokinetic parameters with non-steady-state concentrations will be discussed. The second situation will demonstrate the concept of the clinically relevant peak concentration with vancomycin. Specifically, differences between peak vancomycin concentrations drawn 1 hour after the end of a 1-hour infusion and back-extrapolated theoretical concentrations will be addressed. Finally, a simulated patient case with phenytoin will reinforce the clinical pharmacist's understanding of Michaelis-Menten principles and dispel any myths associated with non-linear pharmacokinetics.

Goals And Objectives

1. To provide clinical pharmacists with a practical approach on pharmacokinetic monitoring.
2. To highlight the relevance of utilizing imperfect data in pharmacokinetic monitoring.
3. To discuss recommendations on how to interpret drug concentrations obtained during three commonly-encountered pharmacokinetic monitoring scenarios (one each with the aminoglycosides, vancomycin and phenytoin).

Self-Assessment Questions

1. How can the use of steady-state equations for calculation of pharmacokinetic parameters with aminoglycoside concentrations obtained under non-steady-state conditions be justified?
2. What is the clinically relevant peak vancomycin concentration – the concentration drawn 1 hour after the end of a 1-hour infusion or the back-extrapolated theoretical concentration?
3. When is it appropriate to use the Ludden method for calculation of pharmacokinetic parameters with phenytoin concentrations? What should be done it if is not appropriate to use the Ludden method?

Writing Effective Learning Objectives.

Donna M.M. Woloschuk, PharmD, Winnipeg Regional Health Authority, Winnipeg, MB

Most hospital pharmacists will be called on at some point in their career to write learning objectives. Well-written learning objectives facilitate giving effective feedback to learners. Patient education or staff inservice programs, pharmacy residency programs, and courses instructed on behalf of a school or college are examples of education situations that benefit from effectively written learning objectives.

Before starting to write learning objectives, pharmacists should carefully consider what is the precise performance problem that will be solved or prevented through education and training. Careful analysis of the problem situation is required because education is not the answer to all performance problems. Unfortunately, it is all too easy to waste time, energy, money and goodwill on education or training initiatives for situations better solved by correcting equipment or human resource deficits. If a performance problem will truly be improved through more knowledge or skill, a well-constructed problem statement will permit development of an appropriate instructional goal statement to guide creation of learning objectives. Most models for writing effective learning objectives include three elements: (1) the task to be completed; (2) the conditions under which the task will be done; and, (3) the level of expected performance (outcome). This workshop will introduce pharmacists to the Mager, Bloom and Krathwohl tools that facilitate writing effective learning objectives. Participants will have ample opportunities to practice using these basic tools, to write learning goals and objectives for education programs commonly taught by pharmacists.

Goals and Objectives

At the end of this session, participants should be able to:

1. In a small group setting, create a concise problem statement for a performance gap identified from a case study.
2. Using the Mager model and the Bloom and Krathwohl taxonomic tools, write three learning objectives that will effectively resolve or prevent the problem identified in the case study.

Self-Assessment Questions

1. According to Bloom's Taxonomy, what level of learning is expected if the learning objective instructs the learner to "explain" or "identify"?
   a. synthesis
   b. analysis
   c. comprehension **
   d. application
2. Why are well-written learning objectives crucial for developing instruction?

a. to indicate the level of performance and criteria for evaluation
b. to validate the content of the instruction
c. to make a tidy first page on an instructional handout
d. a and b **

3. What would be an appropriate way to evaluate performance if a learning objective requires the learner to "compare and contrast"?
   a. Essay question**
   b. Multiple choice question
   c. Demonstrate the behavior
   d. True/False question

Medications and Falls in the Elderly

Barbara Farrell, B.Sc.Phm, PharmD, SCO Health Service, Ottawa, ON

Cheryl Wiens, B.Sc.(Pharm), PharmD, University of Alberta, Edmonton, AB

Goals and Objectives

Attendees will be able to:

- Identify pharmacologic and non-pharmacologic risk factors for falls
- Describe the usefulness and limitations of research regarding falls
- Describe evidence based interventions to reduce risk of falls
- Generate practical ideas to reduce the incidence and impact of falls

Abstract

Falls are a significant problem for seniors. A fall can result in loss of confidence, soft tissue injury, hip fracture, or even complications leading to increased mortality. Elderly subjects often have numerous co-morbidities and consume many medications that increase the risk of falls. Not only do co-morbidities and medications increase the risk of falls, they can often interfere with recovery and healing after a fall.

This presentation will review the impact of falls and the risk factors of which pharmacists should be aware. There will be a focus on identifying subjects most at risk, and a discussion of evidence based interventions that can reduce the number and impact of falls. The pharmacist can play an important role in falls reduction initiatives in seniors. Opportunities for pharmacists will be highlighted through interactive case discussions.

Self-Assessment Questions

1. Which antidepressant contributes to fall risk the least?
2. Will tapering my patient's pain medication decrease the risk of falls?
3. What can a pharmacist do to help clients reduce their risk of falls?

Monday, February 2 • Lundi le 2 février

The Canadian Adverse Events Study

G. Ross Baker, Ph.D., Professor Department of Health Policy, Management and Evaluation, University of Toronto

The Canadian Adverse Events Study will be released in early February 2004. The study provides the first estimate of the incidence of adverse events in Canadian hospitals. The methods are based on the earlier Harvard Medical Practice Study which has also been replicated in Australia, New Zealand, England and Denmark. This presentation will (1) outline the nature of the study and results available; (2) discuss the strengths and weaknesses of chart review methods used in this study for examining adverse events; and (3) identify the ways in which Canadian healthcare organizations and healthcare policy makers need to use this information to improve patient care.

Assessment of Health Technologies for the Prevention of Medication Errors in the Hospital Setting

Michel Boucher, B Pharm, MSc, CCOHTA, David U, B Sc Pharm, MSc Pharm, ISMP Canada

Objectives and learning goals

1. To describe technologies that may help prevent medication errors in the hospital setting
2. To provide an assessment of the effectiveness of such technologies in the prevention of medication errors in the hospital setting
3. To comment on the application of such technologies in hospital practice

Summary

There is currently an increasing amount of attention on patient safety issues and medical

misadventures. Many efforts are currently being dedicated to identify and quantify these errors. The evaluation of error prevention strategies is also important. Due to their scope of practice, hospital pharmacists are particularly interested in the prevention of medication errors. The Canadian Coordination Office for Health Technology Assessment (CCOHTA), in collaboration with the Institute for Safe Medicine Practices (ISMP) Canada, has undertaken an assessment of health technologies for the prevention of medication errors in acute care hospitals.

This presentation will have two parts. The first part will provide a description of the research project, including the methods used and the preliminary results. The second part will link the results of the CCOHTA project to hospital pharmacy practice.

The research project has two main components. The first is a systematic review of studies on technologies that may help prevent medication errors in acute care hospitals. Many new healthcare technologies have been advocated for that purpose. These include the use of electronic MAR, automated dispensing cabinet (ADC), computerized physician order entry (CPOE), and bar-coding medication administration (BCMA). For the purpose of this systematic review, health technologies are defined broadly and include "real" technologies such as the ones defined previously, but also "systems" such as clinical services involving participation of pharmacists in medical rounds, pharmacy- or nursing-managed anticoagulation dosing services and continuous quality improvement (CQI) programs. These interventions occur at all stages of the medication cycle and include medication ordering, medication order transcription, medication preparation and dispensing, as well as medication administration.

The second component is a survey of a sample of directors of hospital pharmacies in Canada. Its purpose is to assess the rate of use of technologies to prevent medication errors in Canadian hospitals, as well as attitudes of pharmacy directors towards these technologies.

With limited hospital resources, the choice of investing into any one of these technologies will depend on the culture, the acceptances by practitioners (especially physicians), finances and the ongoing support by the hospital. Many have considered CPOE. The literature shows that close to 50% of errors occur in the ordering and interpretation stage and only 29% occur in the drug administration stage. Some have suggested that most of the errors at the ordering and interpretation stages are intercepted and corrected by either the pharmacists or nurses. On the other hand, administration of drugs by nurses is the last stage of the drug use process. Other than the patient who might be the last safeguard, there is nothing to stop the nurse from administrating the wrong drug, wrong dose, and even to the wrong patient. Bar-coding drug administration technology which allows scanning of the patient identification, drug profile, and drug to be given will ensure the 5 rights are verified.

Self-Assessment Questions

1. Describe the technologies available for the prevention of medication errors in the hospital setting
2. List these technologies in decreasing order of effectiveness
3. Identify factors to consider in selecting a technology for the prevention of medication errors in the hospital setting.

Upper Gastrointestinal Bleeding Peptic Ulcer Disease: Pharmacotherapy Issues in Acute Management and Secondary Prevention.

Peter J. Zed, B.Sc., B.Sc.(Pharm), Pharm.D., Pharmacotherapeutic Specialist – Emergency Medicine, CSU Pharmaceutical Sciences, Vancouver General Hospital, Clinical Assistant Professor, Faculty of Pharmaceutical Sciences & Associate Member, Department of Surgery, Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada

Abstract

Peptic ulcer is the most common cause of acute upper gastrointestinal bleeding (GIB), accounting for up to 50% of cases. Bleeding stops spontaneously within 72 hours in up to 80% of patients; however, recurrent bleeding during this time period in patients hospitalized for bleeding peptic ulcer increases the need for surgery and the risk of death. Endoscopic treatment for high risk bleeding peptic ulcers reduces recurrent bleeding, need for surgery and death. However, despite these advances, overall mortality of acute upper GIB is approximately 10-15% and has not changed significantly over the past 4 decades.

The role of antisecretory therapy in the acute management of GIB has previously focused on the use of histamine receptor antagonists

(H2RA). However, results of RCTs have confirmed that H2RA do not appear to be of any benefit in reducing recurrent bleeding, need for surgery or mortality. Most recently the focus of antisecretory therapy has shifted away from H2RA to the proton-pump inhibitors (PPI). Proton-pump inhibitors have gained widespread use as antisecretory agents for a number of gastrointestinal disorders and appear to be beneficial in a select population of patients with acute GIB secondary to peptic ulcer diseases.

The purpose of this session will be to review the current pharmacotherapy advances in the acute management of acute GIB secondary to peptic ulcer disease. In addition, secondary prevention strategies which should be considered following acute stabilization will be discussed.

Goals and Objectives

1. To discuss the acute management of upper GI bleeding peptic ulcers with a focus on antisecretory therapy.
2. To discuss secondary prevention strategies following acute stabilization of acute GI bleeding peptic ulcers.

Self-Assessment Questions

1. What is the role of H2-receptor antagonists and proton-pump inhibitors in the acute management of bleeding peptic ulcers.
2. What secondary prevention issues must be considered following acute stabilization of bleeding peptic ulcers?

Acute Ischemic Stroke: A Practical Approach to Management, With an Ounce of Prevention

Peter Loewen, Vancouver Coastal Health Authority, Vancouver, BC

Despite vigorous research, prevention and treatment efforts and the emergence of several efficacious therapies, stroke remains a major cause of morbidity and mortality. Pharmacists caring for patients hospitalized with acute ischemic stroke can address several issues during the acute and post-acute phases including management of stroke-specific drug therapies and detection and management of complications such as electrolyte imbalances, DVT/PE, hyperglycemia, hyperthermia, elevated intracranial pressure, seizures, hypertension, and intracranial bleeding. These drug-related issues will be discussed in light of the best available evidence. Pharmacists are also presented with challenges related to secondary prevention of stroke. In addition to several antiplatelet therapies and combinations, other therapies such a ACE-inhibitors and HMGCo-A reductase inhibitors have recently demonstrated efficacy. In this session an approach to current challenges in prevention will be briefly discussed.

Goals and Objectives

1. To provide participants with an understanding of the basis for contemporary acute stroke pharmacotherapeutic interventions;
2. To familiarize participants with the most current evidence and consensus guidelines for stroke management;
3. To emphasize the role of the pharmacist in the acute management of patients with stroke;
4. To discuss some commonly encountered challenging therapeutic issues related stroke prevention, from an evidence-based perspective;

Self-Assessment Questions

1. Name 8 issues which pharmacists caring for patients in the immediate post-stroke period should be prepared to identify and address.
2. What drug therapies should be considered for secondary prevention of stroke in all patients?

Tuesday, February 3 • Mardi le 3 février

Advocacy: Finding Your Voice

Marlo Palko, Fleishman-Hillard, Toronto, ON

On many levels, the profession of pharmacy is changing. Like never before, pharmacists are assuming pivotal roles on collaborative healthcare teams and are aggressively driving innovations in both their practice and in the delivery of patient care.

At the same time, Canadian political and social agendas are in transition. Legislation reviews, the development of new standards of practice, and initiatives such as the Romanow Commission provide clear opportunities for pharmacists to embrace a new and proactive voice in Canadian healthcare.

The goal of this session is to provide a brief introduction to pharmacists as advocates and the

impact pharmacists can have on their own scope of practice, the Canadian healthcare environment and, ultimately, the care of patients. Through an understanding of the tools and opportunities available in both the short and long term, pharmacists are in an ideal situation to influence key decision makers and advance patient-centred pharmacy practice in Canada.

Goals and Objectives

1. To provide pharmacists with an overview of the current healthcare advocacy environment
2. To offer pharmacists basic tools to bolster their advocacy efforts and efficacy

Self-Assessment Questions

1. What are the main advocacy tools available to Canadian pharmacists?
2. How do I set clear objectives and measure the impact of my efforts?

Adjunctive Endocrine Therapies in Sepsis – Beyond Antibiotics

Doson Chua, BSc(Pharm), PharmD, Fraser Health Authority, Abbotsford BC

Sepsis is associated with a high mortality rate and is the leading cause of death in the Intensive Care Unit. Traditionally, the cornerstone of treatment is supportive therapy and antibiotics. Recent research has shown that septic patients exhibit endocrine abnormalities and adjunctive treatment with endocrine therapies improves patient outcomes.

A significant number of septic patients experience a state of relative adrenal insufficiency, which is associated with a higher mortality rate. The use of exogenous, stress dose corticosteroids to supplement septic patients exhibiting relative adrenal insufficiency has proven mortality benefit. Vasopressin has been observed to be deficient in septic patients. Small trials show that the use of vasopressin in sepsis that is refractory to conventional catecholamine support provides hemodynamic benefits. The evidence for vasopressin is emerging, but is currently not a prominent therapy in sepsis. Critically ill patients commonly exhibit hyperglycemia, which has been associated with poor outcomes. Tight glycemic control with intensive insulin therapy has been demonstrated to reduce mortality rate and the incidence of sepsis.

Endocrine therapies should be considered for all septic patients, however there are still outstanding questions regarding their optimal regimen and adverse effects.

Goals and Objectives

1. To provide pharmacists with an understanding of the pathophysiology of some endocrine abnormalities seen in sepsis
2. To review adjunctive endocrine drug therapies that are currently used in the treatment of sepsis and the evidence supporting their efficacy
3. To review adverse effects and monitoring parameters associated with the use of adjunctive endocrine drug therapies in sepsis

Self-Assesment Questions

1. What hormones/endocrine system are been shown to be deranged in septic patients?
2. Which adjunctive endocrine drugs/drug therapy (including dosage regimens and monitoring parameters) should be considered for septic patients?

Clinical Trials That May Change Your Practice In General Medicine

Olavo A. Fernandes, BScPhm, PharmD, Toronto General Hospital, Toronto ON

In this age of constantly evolving therapeutic research, the publication of clinical trials can have an immediate impact on contemporary pharmacy practice. The goal of this session is to provide a practical overview of the significant clinical implications of recently published trials in the area of General Medicine. Selected key clinical trials (3-4) from a number of different therapeutic topics including Infectious Disease, Cardiology and Thrombosis will be outlined. Trial objectives, patient populations, study endpoints will be reviewed with an emphasis on practical clinical implications, strengths and limitations. Specific topics to be covering include: optimal anticoagulation in treating cancer patients with venous thromboembolism, revisiting the role of corticosteroids in the management of adult patients with meningitis and the concurrent role of angiotensin receptor blockers with conventional therapy in congestive heart failure patients.

Goals and Objectives

1. To outline the major objectives, results and conclusions of recent clinical trials that affect patient management for General Medicine Pharmacy practitioners

2. To evaluate selected clinical trial evidence in terms of highlighting strengths, limitations and summarizing practical clinical implications to the everyday management of General Medicine patients

Self-Assesment Questions

1. Is it appropriate to add an ARB concurrently to a CHF patient already receiving an ACEI, BB, spirinolactone ?
2. Which adult meningitis patients should receive dexamethasone therapy? What is the optimal regimen and duration? Which patients will benefit the most?
3. What is the optimal anticoagulation regimen (warfarin or LMWH) to prevent recurrent venous thromboembolism in a cancer patient? Which patients will benefit the most?

Cardiovascular Risk And Renal Disease – An Unrecognized Problem

Colette Raymond, PharmD, Winnipeg Regional Health Authority, Winnipeg MB

The goal of this session is to provide pharmacists with an understanding of cardiovascular risk factors for patients with chronic kidney disease and those receiving dialysis.

Cardiovascular disease (CVD) is an important cause of morbidity and mortality for patients with chronic kidney disease (CKD) and for those receiving dialysis. Most patients with CKD and receiving dialysis have several traditional CVD risk factors, as well as risk factors that are unique to this patient population. The management of hypertension is an important component of risk reduction. General blood pressure targets for hypertension are 130/80mmHg for patients with chronic kidney disease and 140/90mmHg for patients receiving dialysis. The management of hyperlipidemia in this patient population is also important; target LDL should be <2.5 mmol/L. Control of diabetes is also important, with a target HgBA1C <7%. In addition, the management of anemia is essential for the prevention of CVD disease in this patient population.

Goals and Objectives

1. To review risk factors for cardiovascular disease in patients with chronic kidney disease, and receiving dialysis
2. To review strategies for the management of risk factors for cardiovascular disease in patients with chronic kidney disease, and receiving dialysis, including the management of
   a. Hypertension
   a. Hyperlipidemia
   a. Diabetes

Self-Assesment Questions

1. Does the reduction of cholesterol have an impact on progression of renal disease?
2. What happens to insulin requirements as patients progress from CKD to chronic renal failure?
3. Do angiotensin receptor blockers prevent dialysis in patients with chronic kidney disease?

Pharmacotherapeutic Approach to Acute Renal Failure

Sean Gorman, BSc.Pharm.,Pharm.D., Pharmacotherapeutic Specialist - Critical Care Vancouver General Hospital

Acute renal failure is a common problem in the hospitalized patient. The pharmacist plays a vital role in the prevention, identification, and treatment of acute renal failure. There will be a brief description of the incidence and impact of acute renal failure in the hospitalized patient, definition(s) of acute renal failure, classification of the various types of acute renal failure, drug-related causes of acute renal failure, and the risk factors for acute renal failure. The focus of this presentation will describe the pharmacotherapeutic goals in acute renal failure, describe the general principles of prevention and treatment of acute renal failure, critically examine the evidence supporting the use of diuretics, adrenergic agonists, and other pharmacotherapy for the prevention and/or treatment of acute renal failure. The management of common complications of acute renal failure including hyperkalemia and metabolic acidosis will also be discussed. Finally, there will be a brief introduction to renal replacement therapies, with a focus on continuous renal replacement therapies which are commonly utilized in the critical care settings. Pharmacotherapeutic implications of renal replacement therapy, such as drug dosing, will be discussed.

Goals and Objectives

1. Understand the definition(s) of Acute Renal Failure (ARF).
2. Understand the difference between anuria, oliguria and non-oliguria.

3. Familiarize yourself with the three major categories of ARF.
4. Familiarize yourself with the etiologies of the 3 major categories of ARF.

   a. Focus on drug-related causes
5. Familiarize yourself with the risk factors for developing ARF.
6. Be familiar with the therapeutic goals in the management of ARF.
7. Understand the general principles of prevention and pharmacotherapeutic treatment of ARF.
8. Be familiar with the role of the following pharmacotherapies in prevention/treatment of ARF:

   a. Loop diuretics
   c. Dopamine
   d. N-acetylcysteine
9. Be able to recognize/treat the common complications of ARF.
10. Understand the pharmacotherapeutic implications of renal renal replacement therapy.

Self-Assessment Questions:

1. What are two common causes of pre-renal, intrinsic, and post-renal acute renal failure?
2. What pharmacotherapeutic interventions have been shown to prevent development of acute renal failure?

Adult Parenteral Nutrition – A Refresher Course

Diane E. Baldwin, B.Sc (Pharm), Program Operations Manager, McKesson Medication Management

The goal of this session is to provide pharmacists with a review of current recommendations in adult parenteral nutrition (PN). During this session, patient assessment, formula selection, patient monitoring, collaborative approach with other health professionals in providing optimal patient care and optimal compounding methods will be discussed.

The second part of the workshop will focus on case studies, where the participants will have the opportunity to use the information provided to demonstrate appropriate order review and monitoring. Please bring a calculator.

Goals and Objectives

1. To provide pharmacists with an understanding of risks and current recommendations for Adult PN.
2. To enable pharmacists to properly assess an adult PN order and provide treatment recommendations to other health care professionals.
3. To enable pharmacists to work as a member of a patient care team and assist collaboratively with patient monitoring.
4. To enable the pharmacist to determine the most appropriate compounding method for their individual workplace, i.e. manual, partially automated, fully automated.

Self-Assesment Questions

1. What are the major risks associated with PN? Is this PN order appropriate for my patient?
2. How do I monitor my PN patient effectively? What should I monitor and how frequently? How do I most effectively monitor my patient collaboratively with other health care providers?
3. Is my hospital pharmacy using the most cost efficient method of preparing PN?

Management of Pneumocystis Jiroveci Pneumonia (PJP) in the HIV-infected Population after Trimethoprim-Sulfamethoxazole (TMP/SMX) Failure

Nancy Sheehan, B.Pharm, MSc, McGill University Health Centre, Montreal, QC

With the advent of highly active antiretroviral therapy, the prevalence of Pneumocystis jiroveci pneumonia, formerly known as Pneumocystis carinii pneumonia, has greatly diminished. The treatment of choice remains trimethoprim – sulfamethoxazole (TMP/SMX) 15 – 20 mg/ kg / day divided every 6 to 8 hours as it is the most effective therapy. However, the incidence of TMP/SMX premature discontinuation varies between 20 to 50 per cent. This therapeutic failure is principally explained by intolerance to the medication, namely hypersensitivity reactions, drug fever, and bone marrow suppression. A smaller proportion of TMP/SMX failures are related to lack of efficacy, potentially associated to resistance to TMP/SMX through the development of mutations at the dihydropteroate synthase gene.

When failing TMP/SMX, patients infected with PJP may receive various other regimens such as

trimethoprim / dapsone, clindamycin / primaquine, pentamidine, atovaquone and trimetrexate. These regimens are kept as second or third-line agents as their efficacy may be inferior to TMP/SMX or due to the presence, in some cases, of more severe toxicities. TMP/SMX desensitization may also be attempted with patients who develop a hypersensitivity reaction.

Comparative studies evaluating the efficacy of second and third line regimens will be presented as well as an overview of potential adverse drug reactions related to these agents. Furthermore, the topic of TMP/SMX hypersensitivity reactions and the efficacy of desensitization protocols in the HIV – infected population will be reviewed.

Goals and Objectives

At the end of this session, participants will be able to:

1. Describe the etiology, pathophysiology, epidemiology, and clinical presentation of Pneumocystis jiroveci pneumonia (PJP) in the HIV – infected population.
2. Describe the potential causes for failure of first – line PJP therapy.
3. Compare the efficacy of trimethoprim – sulfamethoxazole (TMP/SMX) to the efficacy of second and third-line PJP regimens, including trimethoprim-dapsone, clindamycin-primaquine, pentamidine, atovaquone, and trimetrexate.
4. Monitor the efficacy and tolerability of second and third-line PJP regimens.
5. Describe the pathophysiology of TMP/SMX hypersensitivity reactions in the HIV – infected population and the efficacy of TMP/SMX desensitization protocols.

Drug Interactions for Antiretroviral Drugs: Mechanism and Clinical Implications

Rolf P.G. van Heeswijk, PharmD, PhD, The Ottawa Hospital/The Ottawa Health Research Institute, Ottawa, ON

All HIV protease inhibitors (PIs) and non-nucleoside reverse-transcriptase inhibitors (NNRTIs) are extensively metabolized by cytochrome P450 metabolic enzymes (especially CYP3A4). Furthermore, the PIs are all substrates for the multi-drug transporter P-glycoprotein (Pgp), which plays an important role in the absorption and disposition of these drugs. Modulation of the activity of CYP450 enzymes and/or Pgp, by antiretroviral drugs or by co-administered drugs and natural health products (NHPs), may thus result in numerous clinically relevant pharmacokinetic interactions.

The potent inhibitory effect of ritonavir on CYP3A4 is well established and is exploited to optimize the pharmacokinetic profile of co-administered PIs. Ritonavir "boosted" regimens are widely used in clinical practice nowadays. Recent data suggests that ritonavir may also inhibit Pgp, which may contribute to the improved pharmacokinetics of co-administered PIs.

Several (antiretroviral) drugs and NHPs (e.g. rifampin, St. John's wort) are potent inducers of Pgp and CYP3A4, mediated by stimulation of the pregnane X receptor (PXR), and may thus have a negative effect on the pharmacokinetics of PIs and NNRTIs. Given the important role of Pgp in the absorption and disposition of the PIs, as well as numerous other clinically important drugs (e.g. digoxin), interactions via Pgp need to be investigated further.

Reduced plasma concentrations of the PIs and NNRTIs increase the risk for the development of drug resistant viral strains, which may severely compromise future therapeutic options due to cross-resistance within each class of antiretroviral drugs, while increased exposure may increase toxicity. Identification and management of drug interactions is thus of paramount importance to achieve durable suppression of HIV replication.

Goals and Objectives

1. To provide pharmacists with an understanding of the mechanisms of both positive and negative antiretroviral drug-drug and drug-NHP interactions, and to discuss the clinical implications of these interactions.
2. To enable pharmacists to assess the potential for a pharmacokinetic interaction between antiretroviral drugs and co-administered drugs/NHPs.

Self-Assesment Questions

1. What is your advice to a patient on a PI-containing regimen, who also uses a NHP that has been reported to activate PXR?
2. How could inhibition of Pgp contribute to an improved efficacy of PIs?

Wednesday, February 4 • Mercredi le 4 février

Pharmacokinetic And Pharmacodynamic Aspects Of Spaceflight

Eleanor A. O'Rangers, Pharm.D., AstraZeneca LP, Wilmington, DE, USA

This presentation will explore the physiologic effects of spaceflight with an emphasis on the medical problems of astronauts and potential countermeaures (treatment) for these problems.

Physiologic changes associated with microgravity, including cardiovascular and musculoskeletal deconditioning, immune function changes, bone demineralization, and endocrinologic effects will be introduced and placed in perspective relative to their potential impact on astronaut health, mission function and application to disease management on earth. Countermeasures, both currently used and proposed, will be addressed. US and Russian approaches to countermeasures may also be incorporated into the presentation. Medication use during spaceflight will also be addressed as a corollary to the countermeasures discussion; current contents of medical kits, typical medications used and what is known about how drugs work in microgravity will be mentioned. Finally, future medical research issues/operational needs will be discussed, which will include (but may not be limited to) new countermeasures, surgery and CPR capabilities and special long-duration spaceflight needs, including physiological assessment and well-being (psychological) maintenance. Finally, the role of a pharmacist in the health maintenance of astronauts will be explored.

Goals and Objectives

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

1. Describe the potential effects of microgravity on the pharmacokinetics and pharmacodynamics of selective medications.
2. Describe issues involved in the selection and use of medications during spaceflight
3. List three research challenges with regards to medication use during spaceflight which have yet to be adequately answered.
4. Discuss three areas in which a pharmacist's drug therapy expertise would be of unique value to the US Manned Spaceflight Program.

Self-Assessment Questions

1. (True/False) Microgravity pharmacokinetics and pharmacodynamics of medications commonly carried on the Space Shuttle or International Space Station have been well-characterized.
2. Which of the following physiologic changes have not been observed in microgravity?
   a. Cardiovascular deconditioning
   b. Osteoporosis
   c. Hypervolemia
   d. Altered intestinal motility
3. Which of the following medications are carried on board the Space Shuttle and the International Space Station?
   a. Benzodiazepines
   b. Antiemetics
   c. NSAIDS
   d. Decongestants/antihistamines
   e. All of the above

Oncology Pharmacogenomics: The Future Is Now

Jill M.Kolesar, PharmD, University of Wisconsin-Madison, Madison, WI, USA

The goal of this session is to provide pharmacists with an understanding of the basics and clinical applications of pharmacogenomics for integrations into their clinical practice.

Pharmacogenomics has emerged from a research idea to a clinical reality. Pharmacogenomics is driving drug development and is now being incorporated into routine clinical practice. Genetic polymorphisms in drug metabolizing enzymes, transporters, receptors, and other drug targets have been linked to inter-individual differences in the efficacy and toxicity of many medications used commonly in cancer patients. A brief overview of pharmacogenomic principles, followed by clinical cases where pharmacogenomics are clinically applied in oncology pharmacy practice and oncology drug development will be described.

Goals and Objectives

1. List clinically relevant uses of pharmacogenetics in daily oncology pharmacy practice.

2. Identify ways that genetic variation can influence the disposition and activity of medications.
3. Recognize the contribution of genetics on the inter-individual variability in drug disposition and activity.

Self-Assesment Questions

1. Name one polymorphism that is routinely tested prior to administration of 6-MP?
2. How do polymorphisms influence the pharmacokinetic and pharmacodynamic properties of anti-cancer agents?
3. How common are polymorphisms in human populations?

Update on Breast Cancer

Pamela Ng, Princess Margaret Hospital, University Health Network, Toronto

The goal of the session is to provide pharmacists with a brief overview of breast cancer, as well as an update on the most current treatment of breast cancer.

Breast cancer is currently the most common cancer in women. In 2002, there were 20,500 cases diagnosed, and 5400 deaths attributed to breast cancer. The incidence of breast cancer has risen dramatically in the last 20 years, although with improvements in treatment, there has been a steady decline in mortality due to breast cancer in this same time frame.

Surgery, chemotherapy, hormonal therapy, and radiation, alone or in combination, have been used as treatments for breast cancer. One of the most exciting new findings is from Dr. Paul Goss, who is a medical oncologist at PMH, whose study involves using letrozole in postmenopausal women after five years of tamoxifen therapy for early-stage breast cancer. The significant improvement in disease-free survival in women on letrozole provides hope to many women who have been on tamoxifen for 5 years, since there has previously been no good data supporting further therapy in these patients.

Self-Assessment Questions

1. How is breast cancer commonly managed?
2. From Dr. P. Goss' study, in what setting should letrozole be used?

Update On Lung Cancer

Wayne Cottrell, BScPhm, Princess Margaret Hospital, Toronto ON

Lung cancer remains the leading cause of death due to cancer in Canada; over 350 Canadians died each week, on average, in 2003. While the incidence rate of lung cancer in males has dropped over the past 2 decades, it continues to rise in females.

Historically, treatment of advanced non-small cell lung cancer (NSCLC) consisted invariably of best supportive care. Recently, nonetheless, chemotherapy treatment of advanced NSCLC has demonstrated a modest improvement in one-year survival (10%). Furthermore, patients report an improvement in disease-related symptoms, albeit short-lived.

Platinum-based doublet regimens are most commonly employed as first-line chemotherapy of advanced NSCLC, and docetaxel has established itself as an effective second-line single agent. Now, we are exploring the efficacy and safety of antibodies to VEGF, and EGFR blockers such as erlotinib (Tarceva") and gefitinib (Iressa"). The controlled clinical trial remains, very much so, the option to be considered in this disease.

Goals and Objectives

1. To acquaint pharmacists with the findings of recent investigations into treatment of NSCLC.
2. To discuss new treatments now or soon to become available for treatment of NSCLC.

Self-Assessment Questions

1. How effective is chemotherapy for treatment of advanced non-small cell lung cancer?
2. What do I tell my patients about the newer targeted therapies

Update on Colorectal Cancer

Amrita Daftary, BSc (Pharm), Princess Margaret Hospital, University Health Network, Toronto, ON

This session will offer a brief update on colorectal cancer. Topics to be discussed include incidence, risk factors, complications and current treatment options in colorectal cancer. In addition to standard treatment guidelines, novel therapies and clinical trials will be briefly touched upon.

Goals and Objectives

1. To provide pharmacists with a better understanding of the issues surrounding colorectal cancer so they may provide optimum care to these patients. This is an important subject to understand, particularly when patients receive care for co-morbid conditions that may be influenced by their cancer diagnosis.
2. To educate pharmacists on some of the new treatment options available to patients with colorectal cancer
3. To cast a glance at some novel therapies and clinical trials in colorectal cancer.

Self-Assessment Questions

1. What is the prevalence of colorectal cancer in Canada?
2. What are some of the risk factors and complications that accompany colorectal cancer?
3. Describe some of the treatment options available to patients with colorectal cancer?

Establishing Emergency Medicine Clinical Pharmacy Services

Payal Patel, BSc(Pharm), PharmD, London Health Sciences Center, London ON.

Emergency medicine (EM) is an extremely exciting and rewarding area of pharmacy practice. The emergency department's (ED) unpredictability, its complexity, and potential chaotic activity epitomize the specialty of EM. Clinicians who work in the ED must be able to multi-task and identify the urgency of a task. There are various types of EDs ranging from relatively low-acuity to large trauma centers. Despite the differences in design, the one commonality is the wide spectrum of diseases that are encountered in the ED.

Pharmacists have played a key role in the ED since the 1970s. Initial services focused on inventory control and cost-containment issues and the development of 24-hour pharmacy satellites to ensure accurate inventory of all medications and appropriate intravenous admixture preparation. Clinical pharmacy services evolved to include identification of drug-related problems, adverse drug reaction surveillance, pharmacokinetic and toxicology consultation, on-call pharmacy services and provision of cardio-pulmonary resuscitation.

Many ED visits and subsequent hospital admissions are in some part, if not entirely, related to a drug-related problem. Although many drug-related problems can be resolved without a major impact on patient health, some are associated with significant morbidity and mortality. A probability model estimated that morbidity and mortality associated with drug-related problems account for $76.6 billion in hospital costs, 17 million EM visits, and 8.7 million hospital admissions annually in the United States.

A systematic search of reports published in the English language suggest drug-related problems account for as many as 28% of ED visits, of which as many as 24% resulted in hospital admissions. Approximately 70% of the drug-related visits to the ED were deemed preventable. A clinical pharmacist in the ED may aid in identifying and resolving drug-related issues with subsequent reductions in morbidity, mortality and economic burden placed on our health-care system.

Goals and Objectives

1. To provide pharmacists with guidance in establishing clinical services in the emergency department.
2. To discuss current examples of emergency medicine pharmacy services in North America.

Power Pointers: Tips On Using Powerpoint, To Create And Deliver Effective Presentations

Muhammad K. Zuberi, BScPhm, University Health Network, Toronto, ON

The ability to communicate effectively is a fundamental skill that pharmacists regularly rely upon. Developing and delivering effective presentations requires both written and verbal communication skills. Information retention following a presentation is generally limited to 3-5 key points. By using PowerPoint,, an extremely powerful, feature rich application, speakers may enhance learning by visually reinforcing and explaining key concepts.

The process of presenting effectively may be divided into two core components (1) content development and (2) presentation delivery. In order to present effectively, the key message must be tailored to meet the needs of the intended audience. By adopting some simple

features of PowerPoint,, speakers may optimize both presentation development and delivery.

Content development includes the development of objectives, acquisition of information, organization of content, creation of visuals like charts and graphs, slide layout, slide sequence, and revision. PowerPoint, techniques that may be adopted in order to make content development more efficient include the use of slide templates, slide summaries, and imported graphics. Effective slide design includes the appropriate use of font size, contrasting colours, and negative space.

Effective delivery focuses on the ability to convey static content into an engaging presentation. PowerPoint, techniques that may be used to facilitate this include the use of slide animations, flow charts, and strategic pauses.

PowerPoint, is a powerful presentation aid that may enhance both content development and presentation delivery for the ultimate goal of optimizing learning.

Goals and Objectives

1. To provide pharmacists with simple PowerPoint, techniques designed to improve the efficiency of content development
2. To provide pharmacists with simple PowerPoint, techniques designed to improve the effectiveness of presentation delivery

Self-Assesment Questions

1. What are the key considerations in presentation design and delivery?
2. What are the main components in an effective slide design?
3. How can slide transitions enhance presentation delivery?

Management Of Drug-Induced Osteoporosis

Anne Marie Whelan, Pharm.D., College of Pharmacy, Dalhousie University, Halifax, NS

Osteoporosis is a disease characterized by low bone mass and fragility leading to increased risk of fractures. Various factors have been implicated in contributing to the development of osteoporosis. Of particular interest to us, as pharmacists, are the medications that have been associated with negatively affecting bone mass. Recently published Canadian guidelines and consensus reports on osteoporosis list use of medications such as glucocorticoids, anticonvulsants and heparin as risk factors for developing osteoporosis. Additionally, an in-depth review of the literature has identified other medications and natural health products implicated in causing osteoporosis.

This presentation will focus on the medications that have most commonly been associated with causing osteoporosis such as glucocorticoids, anticonvulsants, and heparin. Suggestions for prevention and management will be discussed. Bone remodelling and physiologic mechanisms for maintaining normal serum calcium levels will be reviewed briefly to provide background for understanding how medications alter bone mass

Pharmacist awareness of the risks of these medications to potentially cause osteoporosis should aid in proactive implementation of prevention and/or management strategies.

Goals and Objectives

1. To review normal bone remodelling and calcium regulation.
2. To enable pharmacists to identify the most common medications implicated in causing drug-induced osteoporosis
3. To enable pharmacists to implement prevention and/or management strategies for drug-induced osteoporosis

Self-Assessment Questions:

1. What is the link between calcium regulation and osteoporosis?
2. List the common medications that may cause drug-induced osteoporosis.
3. How should drug-induced osteoporosis be prevented and/or managed?

Practical Application of the Canadian Diabetes Management Guidelines

Christine Papoushek, PharmD University Health Network – Toronto Western Hospital Toronto, Ontario

Diabetes is a complex disease that requires a combination of modalities (diet, activity, drug therapy) in order to reduce the long-term risk of complications. Large scale studies have demonstrated positive benefit in reducing the risk of microvascular and cardiovascular complications when significant reductions in HbA1c, blood pressure, weight loss, lipids and smoking are demonstrated.

However, the ability to achieve significant reductions with these five risk categories can often be difficult. We are constantly faced with scenarios that challenge our ability to apply specific guideline recommendations to the patient.

Diabetes, specifically, is likely the most challenging when trying to apply guideline recommendations due to the numerous barriers that are encountered in managing this disease. As pharmacists, we have an opportunity to assist in breaking down the barriers and facilitate the optimal management of Type 2 DM.

The Canadian Diabetes Guidelines have recently been updated and can serve as an excellent tool to provide treatment recommendations and establish optimal treatment targets. This session will provide an overview of the practical application of these recommendations to assist you in managing your Type 2 DM patient. In addition, an overview of the advantages and disadvantages of the therapeutic options will assist you in using these medications optimally in various clinical scenarios.

Goals and Objectives

1. Discuss the key components of the 2003 Canadian Diabetes Guidelines
2. Discuss the advantages and disadvantages of oral versus insulin therapy in managing Type 2 Diabetes.
3. Describe the potential non-glycemic benefits of certain oral agents for managing Type 2 Diabetes.
4. Utilize clinical scenarios to demonstrate the practical application of the current Diabetes guidelines.

Self-Assessment Questions

1. What are the advantages and disadvantages of oral therapy and insulin for managing Type 2 DM?
2. What are the different approaches to optimizing therapy in patients with Type 2 DM?

What Me Conflicted? Doctors And The Pharmaceutical Industry

Joel Lexchin MSc, MD, School of Health Policy and Management, York University, Toronto and Emergency Department, University Health Network, Toronto

Prescribing medications is an essential part of the practice of medicine and brings doctors into frequent contact with the pharmaceutical industry and its employees. However, the goals of the two parties may not always be compatible. Doctors' first priority is the health of their patients, while drug companies primary obligation is to consider the interests of their shareholders.

There are at least four areas where doctors and drug companies interact: promotion (specifically visits by sales representatives), the production of clinical practice guidelines, continuing medical education and the conduct of clinical research. This talk will look at the conduct of both parties in each of these areas and what the outcome is on doctors' prescribing behaviour. Ways of mitigating any adverse outcomes will be discussed.

Goals and Objectives

1. To make the audience aware of the interactions between doctors and the pharmaceutical industry and how these interactions have the potential to influence the actions of physicians.
2. To promote discussion about how to ensure that interactions lead to positive outcomes for patients.

Self-Assessment Questions

1. What are the similarities and differences between doctors' and pharmacists' interactions with industry?
2. How can doctors and pharmacists work together to help each other counteract any negative effects of interactions with industry?

Oral Anticoagulation Therapy – Past, Present, & Future

Jack Ansell, M.D., Department of Medicine, E113l, Boston University Medical Center, 88 E. Newton Street, Boston, MA 02118

The goal of this session is to provide pharmacists with a framework within which to understand the changes occurring in the field of anticoagulation therapy and to identify these changes.

Oral anticoagulation began with the isolation of dicoumarol from spoiled sweet clover in 1940 and its immediate introduction into clinical use. Warfarin, a synthetic coumarin derivative, came into clinical use in the 1950s and quickly became the major oral anticoagulant in North America. Over the last 50 years, great progress has been made in improving the management

of oral anticoagulation, identifying the appropriate indications, and establishing the most effective therapeutic range. In spite of these improvements, oral anticoagulation management remains a labor intensive process both for the patient and the physician. As a consequence, many patients are either not treated or inadequately treated, while others suffer a high rate of adverse events.

In the last few years, a number of new anticoagulants have been introduced and are undergoing preclinical and clinical testing. Many of these agents are targeted to interact directly with specific coagulation factors and to inhibit their action. Most importantly, some agents are active after oral dosing, do not need coagulation monitoring, and are not influenced by food or other medications. Results from Phase II and Phase III clinical trials will be reviewed and the potential impact on current anticoagulation practices will be discussed.

Goals and Objectives

1. To provide pharmacists with information about new anticoagulants and how they will compete with warfarin.
2. To enable pharmacists to utilize these agents in the context of coordinated anticoagulation programs.

Self-Assessment Questions

1. What are the major drawbacks of vitamin K antagonist therapy?
2. What are the benefits of new anticoagulants in development?
3. What are the limitations of the new anticoagulants?

Drug Eluting Stents And The Pharmacist

Uchenwa Genus, BSc Phm, Toronto General Hospital, University Health Network, Toronto, Ontario, Canada.

The goal of this session is to introduce pharmacists to the technology of drug eluting stents and present some pharmacotherapy considerations to ensure successful outcomes in percutaneous coronary intervention (PCI) patients.

Drug eluting stents (DES) represent a class of advanced biotechnology products composed of the combination of drug and device. These agents have been heralded into interventional cardiology practice to battle major obstacles such as restenosis and subsequent percutaneous revascularization. The benefits of drug eluting stents have been demonstrated in a variety of studies (RAVEL, SIRIUS, E-SIRIUS, C-SIRIUS and the TAXUS series) that show significant reductions in clinical endpoints. Current discussion surrounds the challenge of devising guidelines for appropriate use of drug eluting stents in the PCI patient due to the expensive nature of these agents.

There are pharmacotherapy issues relating to antiplatelet non-adherence, sub-optimal regimens and drug coverage that pharmacists should be aware of and take steps to rectify in order to enable the success of the PCI procedure. In addition, pharmacists should be prepared to provide patient and practitioner education on drugs used in DES and potentially identify any tolerance issues with the technology.

Drug eluting stents are currently in a position associated with a large potential to become standard of care in the future. Cardiology practitioners have a mandate to increase their knowledge of these agents and this includes pharmacists who are involved in the care of PCI patients.

Goals and Objectives

To provide pharmacists with an understanding of drug eluting stents;

- Characteristics of drug eluting stents.
- Literature evidence and guidelines determining use.
- Adjunctive pharmacotherapy and tolerance issues.

Self-Assesment Questions

1. What types of patient populations are eligible to receive DES?
2. What is the importance of adjunctive pharmacotherapy to ensure revascularization success in patients receiving DES?

CHF 2004 Update

Swasti Bhajan Mathur BScPhm, Rouge Valley Health System, Centenary Health Centre Site, Toronto ON

Congestive heart failure (CHF) is increasing in prevalence and is one of the leading causes of hospitalization in the age group over 651. In Canada and the United States, there are more than 5 million patients with CHF including 500, 000 new cases each year[2].

This presentation will highlight several recent advances in the management of CHF (both pharmacological and non-pharmacological) including:

The recent 2002/3 Canadian Cardiovascular Society consensus guideline update for the diagnosis and management of heart failure[3],

Recent trials (COMET, COMPANION, EPHESUS)[4, 5, 6,] and

Practical tips for the management of CHF in an outpatient clinic setting.

Goals and Objectives

1. To review recent advances in the management of CHF.
2 To be familiar with recent trials and different strategies for the management of CHF.

Self-Assessment Questions

1. What are the current Canadian guidelines for the management of CHF?
2. How can the results of COMET, COMPANION and EPHESUS be incorporated into daily practice?

What's New In Peripheral Arterial Disease (Pad)? Hint: Another Silent Killer In The Deadly Triad!

Wendy A. Leong (BScPharm, PharmD, BCPS, MBA), Burnaby Research & UBC, Vancouver, BC

The goal of this presentation is to highlight the important and new developments in the management of peripheral arterial disease (PAD). Current strategies in PAD diagnosis, classification, treatment and drug therapy will be reviewed.

Traditionally, PAD was mislabeled as claudication, and perceived as a benign, localized, non-life threatening medical condition. Typically, it was the elderly who complained about poor circulation, leg cramps and cold feet. Over the past decade, PAD has been more accurately recognized as a marker of generalized cardiovascular risk and mortality.

The Fontaine classification and Ankle Brachial Index (ABI) are useful tools to evaluate and manage PAD. For example, Fontaine Stage IV is characterized by 50% stenosis, focal tissue necrosis and an ABI < 0.3. The protocol for Stage III PAD (daily resting ischemic pain) is initially a 3-month regimen of risk factor modification and antiplatelet therapy. From a cardiovascular perspective, PAD must be recognized as a silent killer - as lethal as hypertension, dyslipidemia and diabetes.

PAD patients need to be managed aggressively as vasculopaths. The term vasculopath refers to a patient with advanced atherosclerotic disease in major organs. Vasculopaths are at high risk of stroke and myocardial infarction (MI), warranting aggressive primary and secondary prevention strategies.

Evidence-based PAD drug therapy includes antiplatelets, anticoagulants, vasodilators, cholesterol lowering agents, ACE inhibitors, etc. Other strategies include angiogenic growth factors and new surgical interventions.

Goals and Objectives

1. To highlight the important and new developments in the management of peripheral arterial disease (PAD)
2. To review the current strategies in PAD diagnosis and classification
3. To compare options in PAD treatment, including drug therapy

Self-Assesment Questions

1. What is the Fontaine classification of PAD? What are the localized and systemic complications of PAD?
2. How is the Ankle Brachial Index (ABI) used to diagnose the severity and prognosis of claudication?
3. What is the most current protocol for PAD drug therapy and surgical intervention?

Sunday, February 1, 10:00 – 10:45 Grand Ballroom Foyer

1. Hepatitis Immunization Program for Hemodialysis Patients
2. A Review of the Current Literature on the Design and Evaluation of Medication Adherence Aids
3. Olanzapine Prolongation of Clozapine-Induced Agranulocytosis
4. Evaluation of the Initial Empiric Treatment of Community-Acquired Pneumonia (CAP) in a Teaching Hospital
5. Enhancing the Functionality of an Integrated Clinical Information System
6. Severe Acute Respiratory Syndrome (SARS): The Pharmacists' Role
7. Potential Contribution of Metformin to Fatal Lactic Acidosis in an Elderly Patient with Predisposing Risk Factors – A Case Report and Literature Review
8. Feasibility of a Vasopressor Titration Protocol in a Community Hospital ICU Setting
9. Case Report: Pergolide-Induced Pleuropulmonary Disease Presenting as an Empyema
10. Risperidone-Induced Mania: Case Report and Review of the Literature
11. Systematic Review of the Use of Atypical Antipsychotics in Affective Disorders

Monday, February 2, 13:45 – 14:30 Sheraton Hall

1. Development of a Program for the Use of low Molecular Weight Heparin in Heart Valve Replacement Patients upon Hospital Discharge
2. Collective Prescription Protocol for Provision of Mefloquine to Canadian Forces Personnel Deploying to Afghanistan
3. Improving the Quality of Life – Renal Anemia Management Program
4. Olanzapine-Induced Acute Pain Pancreatitis
5. What Interventions Work to Influence Clinicians' Prescribing Practices
6. An Explanatory Model to Describe the Role of the Consulting Primary Care Pharmacists in a Family Physicians Office Setting
7. Seamless Care Initiative for patients on Combination Antiplatelet Therapy
8. Pharmacy Experience with Severe Acute Respiratory Syndrome at the Scarborough Hospital
9. Review of 34 Probable Severe Acute Respiratory Syndrome Patients Administered Intravenous Ribavirin
10. The Use of Drotrecogin in the Management of sepsis in Fraser Health Health, BC.
11. Probable Linezolid-Induced Pancytopenia
12. Determining the Importance of Different Features of Therapeutic Information in Seniors with Type 2 Diabetes

Tuesday, February 3, 13:45 – 14:30 Sheraton Hall

1. Utility of Anti-Xa Monitoring in Children Rceiving Enoxaparin for Therapeutic Anticoagulation
2. The Nature of Preventable Adverse Drug Events in a Long Term Care Hospital
3. Quality Improvement Using the Collaborative Model for Change: Experience from a Pain Collaborative Project
4. Gatifloxacin Drug Use Review: Indication and Adverse Drug Reactions
5. A Pharmacokinetic Study of the Administration of Gentamicin in Pre-Term and Term Neonates: The Development and Validation of a Nomogram
6. The Search for an Interactive Hospital Computer Program for the 21st Century
7. The Impact of pharmacists-Provided Education on Initiation of Osteoperosis Treatment in Following Fragility Fractures
8. Retrospective Analysis of a Pharmacists-Directed Warfarin Program in a Long-Term Care Setting over a 5-Year Period
9. Development, Implementation and Evaluation of Venous Thromboembolism Prophylaxis Guidelines for General Medicine Patients
10. A randomized Trial of Patient Self-Managed Versus Physician-Managed Oral Anticoagulation
11. Development of a Consolidated Pharmacy Intranet Site at St. Michael's Hospital
12. Pharmacy-Nursing Psycho-Educational Teaching at a Psychiatric Day Program at The Montfort Hospital

Wednesday, February 4, 10:15 – 11:00 Grand Ballroom Foyer

1. Drug Utilization in the Canadian Armed Forces
2. The Evolution of Experimental Learning for Canadian Forces Pharmacists
3. Symptom Resolution of Common Ailments Treated with Over-The-Counter Medications Provided Directly by Community Pharmacists
4. Pre-Testing of Pictorgrams used in Medicines Dispensed in Missions of Humanitarian Relief
5. Pictographic Instructions for Medications: Do Other Cultures Interpret them Accurately?
6. Use of Gastric Acid Suppressants among users of Antidepressants in the Canadian Forces
7. The Effects of Medication use on the Risk of Accidents among Members of the Canadian Forces
8. Stability of Clozapine Oral Suspension Vehicles at Room Temperature
9. Stability of Sulfasalazine Oral Suspensions in Ora-Sweet and Ora-Plus Vehicle at 4°C and 23°C in Three Different Containers
10. Simulation of Y-Site Compatibility of Irinotecan and Leucovorin at Room Temperature (23°C) in 5% Dextrose in Water in Different Containers
11. Which Criteria should be Emphasized when Implementing Surgical Antimicrobial Prophylaxis Guidelines

Sunday, February 1, 10:00 – 10:45 • Grand Ballroom Foyer

Hepatitis Immunization Program For Hemodialysis Patients

Linda Awdishu, BScPhm, Sunnybrook & Women's College Health Sciences Center, Toronto

Rationale

Chronic hemodialysis patients are at an increased risk of hepatitis B viral infection due to exposure to blood during dialysis treatment, the need for blood transfusions and sharing of dialysis equipment.1 Vaccines can play an important role in attenuating the risk of infections in patients with chronic renal failure.1 Despite the obvious benefits of vaccinations, rates of vaccination in nephrology populations continue to be low. In the United States, only 36% of 200,000 chronic hemodialysis patients had received the vaccine in 1996.2 The most common reasons for low vaccination rates include logistics of administration and monitoring, low perceived risk for infection, awaiting revised guidelines from the renal unit, effectiveness of universal precautions, and perceived poor efficacy of the vaccine in dialysis patients.3 Standard orders for screening and administering vaccines are important tools that can overcome some of the above stated issues and increase rates of vaccination.

Program Description

In order to ensure that screening would occur routinely, the pharmacist in collaboration with nursing services developed an immunization program. This program was implemented in late November 2001. The program consisted of standard doctors orders for hepatitis B vaccination, a checklist for nurses on the administration of the vaccines, and documentation sheets to record vaccine administration and lot numbers.

Program Implementation

An educational in-service on hepatitis viral infections in hemodialysis patients was presented to the multidisciplinary team. Approximately 120 hemodialysis patients were screened for hepatitis serology. The primary nurse was responsible for collecting and documenting the serology results on a master list. The pharmacist reviewed the list to identify eligible patients and ordered vaccine from the Public Health Unit. At regular monthly hemodialysis rounds, the pharmacist and the charge nurse reviewed the master list and obtained orders for vaccination from the physicians.

Results

The vaccination rate achieved was 88%. The cost savings realized was $6984.90. Based on the success of this program with the hemodialysis patients, it will be extended in the future to the peritoneal and home dialysis patients as well.

References

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2. Miller ER, Alter MJ, Tokars JI: Protective effect of hepatitis B vaccine in chronic hemodialysis patients. Am J Kidney Dis 33:356-360, 1999
3. Ray S, Samuel T, Hawker J, Smith S: Hepatitis B immunisation in renal units in the United Kingdom: questionnaire study. BMJ 324:877-878, 2002

A Review Of The Current Literature On The Design And Evaluation Of Medication Adherence Aids.

Bonnie E. Lee (BScPhm candidate)1, Jana Bajcar , B.ScPhm, MScPhm, EdD1,2,and Linda Wilson-Pauwels, AOCA, BScAAM, MEd, EdD3,

(1) Leslie Dan Faculty of Pharmacy, (2) St. Michael's Hospital, (3) Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada.

Rationale: A variety of Medication Adherence Aids (MAA) exist to help patients with their medication-taking practice, but up to 50% of patients still do not adhere to their prescribed medication regimens. It is not know to what extent these aids meet patient needs.

Objectives: To review the current literature and describe the types of MAA that have been developed and then to determine the extent to which they have been: (a) designed on the basis of documented patient needs; (b) designed based on relevant theoretical concepts; and (c) evaluated from the patients' perspective.

Methods: Literature from 1966 to present was searched using MedLine, IPA, and EMBASE databases. Additional articles were identified by hand-searching the articles identified through the initial search. The articles compiled were reviewed and categorised according to whether the MAA were designed based on the needs of the target audience and/or theoretical concepts, and whether and how they were evaluated.

Results: Seventeen articles were identified that described 44 different MAA (organisers, reminders, and combined organiser and reminder systems). Only 6.8% of the MAA were designed based on documented needs assessments, 4.5% of the designs were theory-driven and only 34.1% of the MAA were evaluated.

Conclusions and implications: The identified gap in the literature should be addressed and the understanding of the patient's needs that is gained through this used to assess existing MAA and then if necessary guide the development of alternative aids that may more effectively help patients with their medication-taking practice.

Olanzapine Prolongation Of Clozapine-Induced Agranulocytosis

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Background: The incidence of clozapine induced-agranulocytosis is reported to be 1-2% with 88% of cases occuring in the first 26 weeks. Clozapine agranulocytosis is suspected to be caused by a reactive intermediate metabolite acting upon myeloid granulocytic stem cells. Although olanzapine is thought to produce a similar intermediate metabolite, agranulocytosis is infrequently reported and no causal relationship has been confirmed. There are published reports of olanzapine being used successfully to treat patients in whom clozapine has caused neutropenia. However, we report a case of olanzapine prolongation of clozapine-induced agranulocytosis similar to three cases described by Flynn et al (J Clin Psychopharm 1997).

Case: A 49 year old female (Z.S.) diagnosed with schizophrenia and having a history of hospitalizations and suicide attempts was started on clozapine May 20, 2003. Z.S.

was admitted to the hospital June 27 for febrile agranulocytosis (WBC=0.7x109/L, ANC was undetectable). Clozapine was immediately discontinued and it was decided to start olanzapine the following day. Thirteen days later Z.S. remained neutropenic and filgrastim (GCSF) 300?g IV daily was ordered. Despite 6 days of GCSF therapy, neutrophils remained undetectable. At that point, based on the report of Flynn et al, the pharmacist suggested discontinuation of olanzapine. On the fifth day following olanzapine discontinuation the neutropenia resolved. Ultimately, Z.S. was discharged on low dose quetiapine with electro-convulsive therapy planned.

Conclusion: The risk of olanzapine prolongation of clozapine-induced agranulocytosis is not well known. If possible, we suggest withholding olanzapine therapy until the patient's granulocytes normalize.

Evaluation Of The Initial Empiric Treatment Of Community-Acquired Pneumonia (Cap) In A Teaching Hospital

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Background: The empiric treatment of CAP underwent many changes in the last 15 years. In the light of increased use of fluoroquinolones in many infectious processes, we were interested to look into the initial antibiotic treatment of patients admitted for CAP.

Objectives: Describe the initial antibiotic treatment prescribed to patients admitted for CAP and evaluate the conformity rate of the initial prescription compared to the 2000 Canadian consensus guidelines for the treatment of CAP.

Methods: Descriptive retrospective study from medical charts of patients admitted for the treatment of CAP between July 2001 and June 2002.

Results: Medical records from 112 patients were reviewed. The initial empiric treatment prescribed upon admission was consistent with the 2000 Canadian Guidelines in only 54% (61/112) of the patients. However, most of the non-conformity of the treatment choices is explained by a 35% (11/31) non-conformity rate observed in the subgroup of patients who were in class V of the Fine Pneumonia Severity of Illness (PSI) scoring system. Cefuroxime alone (28/112) or combined with a macrolide (24/112) was the most frequently used antibiotic, followed by respiratory quinolones (FQ) (21/112) and ceftriaxone+macrolide (15/112). FQ were mainly used in Fine class IV patients (13/35). The initial therapy was modified in 71% of the patients (80/112) but the conformity rate remained similar afterwards (53%; 60/112).

Conclusions: The choice of the initial therapy for CAP remains highly variable and "older" agents such as cefuroxime are still regularly used. FQ however seemed to be preferred for more severely ill patients.

Enhancing The Functionality Of An Integrated Clinical Information System

Kristi Taylor, Thunder Bay Regional Hospital, Thunder Bay, Ontario; Lisa Sdraulig CPhT, Thunder Bay Regional Hospital, Thunder Bay, Ontario; Jeff Chan B Sc Pharm, Thunder Bay Regional Hospital, Thunder Bay, Ontario; Karen Macdonald, Healthtech Inc., Toronto, Ontario; Ted Rossi B Sc, Summit Healthcare, Franklin, Massachusetts

Abstract:

In 1999, our hospital started implementation of a new integrated clinical information system, across two organizations containing three sites. The Department of Pharmacy went "Live" on November 1, 1999. While the implementation of this new information system provided many advantages, there appeared to be gaps in functionality related to processes that were performed on a routine basis. The objective of the project was to determine whether use of automation scripting software would enhance the functionality of the clinical information system through the generation of routine reports for staff and management. A business case for the purchase of the software was prepared by the hospitals' information systems consultants and the software, The Summit Scripting Toolkit (Summit Healthcare, Franklin, Massachusetts USA) was subsequently purchased for evaluation. An assessment was conducted and the decision was made to give priority to Pharmacy reports. An itemized list was created, starting with automatic printing of medication administration records (MARs) to all nursing units.. Discussions with Pharmacy staff revealed that there was decreased work and better timeliness in generating routine reports for clinical and administrative activity. We conclude that the scripting software was able to enhance the functionality of our clinical information system. Based on this successful trial, the software is being used to automatically create and generate other administrative and clinical reports for the hospital.

Severe Acute Respiratory Syndrome (SARS): The Pharmacist's Role

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An outbreak of severe acute respiratory syndrome (SARS) recently occurred in Toronto.

Purpose: To document the unexpected role and responsibilities of the pharmacist during the SARS crises, and to the share lessons learned.

Methods: All pharmacy-related events and tasks undertaken during the SARS crises were reviewed and documented. Key lessons learned were identified.

Results: After conducting extensive literature search and evaluation, administration and dosing guidelines were prepared for two investigational drugs, ribavirin and interferon alphacon1. Pharmaceutical care (PC) was provided to SARS-affected patients under modified conditions. Current drug distribution procedures were modified and new ones developed to meet more stringent infection control standards. Collaborative teamwork with key stakeholders was important in accomplishing tasks in an efficient and timely manner. There was regular communication with health-care staff internally and externally. Education and update of pharmacists was crucial.

Conclusion: Pharmacists have a vital role to play during crisis management in the areas of drug distribution, drug information and PC. Collaborative teamwork and close communication are keys to success. Pharmacists need to be proactive and take a leadership role in assuming pharmacy-related responsibilities. Lessons learned could be adapted for future crises requiring pharmacy support.

Potential Contribution Of Metformin To Fatal Lactic Acidosis In An Elderly Patient With Predisposing Risk Factors – A Case Report And Literature Review

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Rationale

Lactic acidosis is a well-described rare adverse effect of metformin therapy with a mortality of approximately 50%. Most cases have occurred in individuals with predisposing risk factors. This report will highlight the risk factors and controversy around metformin's contribution to lactic acidosis through a case study and literature review.

Description of Case

A previously well 87 year old male was admitted to hospital with renal dysfunction, pulmonary edema, hepatic necrosis and partially compensated metabolic acidosis

Three days prior to admission, he reported lethargy, nausea and shortness of breath. Past medical history included coronary artery disease, Type 2 DM and CHF. He had no history of smoking, alcohol or drug abuse. Medications included acetylsalicylic acid, furosemide, pantoprazole, metoprolol, metformin, ramipril and fucidin cream.

The patient's course in hospital included episodes of hypotension and subsequent multi-organ system failure. Within three days, the patient expired from lactic acidosis and presumable associated hepatic failure.

Of note, the patient had been admitted two months prior with CHF and normal renal function. The patient's metformin dose was increased during that admission. His SCr doubled over a period of two months.

Analysis of Problem

Metformin may have contributed to the development of lactic acidosis in this patient with other predisposing risk factors.

Implications for Practice

Various predisposing risk factors can lead to lactic acidosis and should be weighed carefully against potential benefits of metformin. Frequent clinical and laboratory reassessment may be warranted in high risk patients.

Feasibility of a Vasopressor Titration Protocol In a Community Hospital ICU Setting

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Rationale: ISMP identified the importance of maximizing safety when titrating vasopressors. Titration of vasopressor agents requires frequent adjustment based on rapidly changing hemodynamics. Lack of familiarity with these agents in a community hospital ICU population led to a review of current practice.

Objectives: The primary objective was to determine the feasibility of a standardized process to guide community hospital ICU clinicians towards the optimization of vasopressor assessment and titration.

Methods: We completed a retrospective chart audit on vasopressor utilization between January 2002 and June 2003. Variables included choice, initiation and titration of agent, monitoring endpoints and safety parameters. Comparisons were analyzed via descriptive and non-parametric testing. A focus group survey was distributed to ICU physicians and nurses to incorporate feedback.

Results: We reviewed 34 titration strategies. In 32% of cases, no vasopressor dosage was identified. In 71% of cases, no maximum dosage was identified. In 34% of cases, no titration endpoint was defined and in 66% of cases, titration endpoints varied between MAP and SBP. Descriptive analysis revealed variability in weaning, titration and fluid replacement. Data analysis and survey results demonstrated a need and readiness for development of a decision tree and preprinted orders.

Conclusion: The feasibility study was a necessary first step prior to implementation of a vasopressor protocol in the ICU setting. Acceptability and descriptive analyses provided an indication of the protocols applicability for a community hospital ICU. The above results supported the pursuit of a standardized vasopressor approach best suited to optimizing patient care.

Case Report: Pergolide-Induced Pleuro-pulmonary Disease Presenting As An Empyema

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Dopamine agonists can induce pleuropulmonary disease. However, to date there is only one reported case of pergolide associated encapsulated pleural effusion. We report another case in which pergolide was implicated.

A 66-year-old man with advanced Parkinson's disease, first diagnosed in 1985, complained of left sided chest wall discomfort. Past medical history included right shoulder fusion, benign prostate hypertrophy, and severe scoliosis. Medications included levodopa/carbidopa, atropine, mirtazapine, tamsulosin, and pergolide. The latter had been started 3 years earlier and gradually increased. Workup included thoracentesis that revealed a large left-sided exudative effusion, which was drained. Cytology and AFP were negative. Two months later, a CT scan showed a large, septated cavity with air fluid levels in the left lung and patient was admitted. The differential diagnoses included malignancy and chronic empyema. The patient was taken to the OR. A chronic inflammatory cavity without pus was found and the lung was decorticated. Subsequent pleural cultures were negative. A neurology consult was obtained and suggested that the pleural effusion was secondary to pergolide. Pergolide was discontinued and replaced with pramipexole, a non-ergot based dopamine agonist.

Pharmacists should be aware of this major adverse effect secondary to use of pergolide and other dopamine agonists.

Risperidone-Induced Mania: Case Report And Review Of The Literature

Artemis Diamantouros, BScPhm, MEd, John Papastergiou, BScPhm, Sunnybrook & Women's College HSC

Risperidone has been reported as both a treatment for mania and as a possible inducer of mania. The case of a 24 year old male who developed manic symptoms after a switch from clozapine to risperidone is reported. The pharmacology of risperidone and how it may be involved in mania is reviewed. Primarily, the activity of risperidone on the 5HT2 receptor and

the alpha2 receptor is explored for potential mania-inducing action. The literature on risperidone as a treatment of mania is reviewed looking at the studies of risperidone in acute mania and the action on the D2 receptor with respect to anti-manic effects. Finally, reports of mania with the other atypical antipsychotics are discussed. Although the exact role of risperidone with respect to mania remains unclear, it is prudent not to discard risperidone as a potential mania-inducing agent. Particularly in patients who have a history of schizophrenia or schizoaffective disorder or patients who are receiving high doses (> 6mg/day) of risperidone and develop manic symptoms, pharmacists should review risperidone as a potential causative agent.

Systematic Review Of The Use Of Atypical Antipsychotics In Affective Disorders

Artemis Diamantouros, BScPhm, MEd., Sunnybrook & Women's College HSC, North York, Ontario

Rationale

The use of atypical antipsychotics for indications other than psychosis is constantly expanding. In particular, current interest lies in the effectiveness of atypical antipsychotics for the treatment of affective disorders. Alternative therapies for these disorders are needed.

Objectives

This review was conducted to identify the evidence available in the literature to support the use of atypical antipsychotics in the treatment of bipolar affective disorder (BAD) and non-psychotic depression.

Methods

A MEDLINE search was conducted to retrieve published trials using the atypicals (risperidone, olanzapine and quetiapine) in the treatment of BAD and non-psychotic depression. Articles were excluded if they were not available at U of T library sites and if they were in a language other than English. Trials were critically appraised and were specifically assessed on study design, number of subjects and outcomes (based on measures used in the study).

Results

Pertinent trials, with the number of trials in parentheses, identified in this search included: risperidone as monotherapy in mania (4); risperidone as add-on therapy (2); olanzapine monotherapy in mania (6); olanzapine add-on therapy (1); olanzapine as maintenance (4); olanzapine in bipolar depression (1); and quetiapine as add-on therapy (2). In addition, trials of olanzapine in non-psychotic depression (2), and risperidone in refractory depression (2) were identified.

Conclusions

The results of this review indicate that there is sufficient evidence to support the use of risperidone and olanzapine in the treatment of mania as both monotherapy and adjunctive treatment. Olanzapine also has evidence to support its use in maintenance treatment of BAD. The evidence in the treatment of bipolar depression and non-psychotic depression is promising; however, larger controlled trials are needed to further investigate this medication.

Monday, February 2, 13:45 – 14:30 • Sheraton Hall

Development Of A Program For The Use Of Low Molecular Weight Heparin In Heart Valve Replacement Patients Upon Hospital Discharge

S Yau BscPhm; FL Paradiso-Hardy BscPhm MSc, FCSHP ; C Bucci BscPhm; WR Bartle PharmD; R Selby MD, FRCPC; S Ong BscPhm, Sunnybrook & Women's College Health Sciences Centre, Toronto, ON

Rationale:

At S&WCHSC, heart valve replacement patients are anticoagulated with unfractionated heparin (UFH) and warfarin to prevent thromboembolic complications. Patients are discharged from hospital once they are adequately anticoagulated with warfarin, which may delay hospital discharge for some patients. Low Molecular Weight Heparins (LMWH) have been shown to be effective when used in the post-operative period after heart valve replacement and they can be safely administered out of hospital, thus reducing the length of hospital stay and associated costs.

Objectives:

To develop a program for the appropriate and safe administration of LMWH in heart valve replacement patients not adequately anticoagulated with warfarin, who are otherwise ready for hospital discharge.

Methods:

Health care professionals in cardiac centers across Canada was surveyed to assess the current utilization of UFH and LMWH at various institutions. In conjunction with the Department of Cardiovascular Surgery and nursing, guidelines and educational support material were developed. A retrospective analysis of 70 consecutive post-operative heart valve replacement patients who were anticoagulated with warfarin provided an estimate of the percentage of patients who would be eligible for the outpatient program.

Results:

An algorithm was developed outlining the essential components of the program, along with educational support material and any necessary intervention tools. A retrospective evaluation showed that 11.4% (8 / 70) of heart valve surgery patients would be eligible for the program on post-op day 5-7.

Conclusion:

Future implementation of this program will decrease the length of hospitalization, minimize hospital costs and improve patients' quality-of-life.

Collective Prescription Protocol for Provision of Mefloquine to Canadian Forces Personnel Deploying to Afghanistan

Authors: Major Douglas Doucette, PharmD, FCSHP, Commanding Officer, Central Medical Equipment Depot Petawawa, Canadian Forces Base Petawawa, Ontario; Captain James Jonasson, BSc(Pharm), Brigade Pharmacy Officer, 2 Field Ambulance, Canadian Forces Base Petawawa, Ontario; Major Mel Storrier, M.D., Brigade Surgeon, 2 Field Ambulance, Canadian Forces Base Petawawa, Ontario, and Major Shannon Sinclair, PharmD, Director of Pharmacy Services, Formation Health Services Unit Halifax, and Officer Commanding, Forward Medical Equipment Depot, Health Services Support Company, Canadian Contingent Task Force Kabul, Operation ATHENA, Kabul, Afghanistan.

Abstract:

In June 2003, 1,900 military personnel were at Canadian Forces Base Petawawa preparing to deploy with Operation ATHENA, Canada's contribution to the International Security Assistance Force (ISAF), to take part in the United Nations (UN)-authorized mission in Kabul, Afghanistan. Local Pharmacy Officers were tasked to provide antimalarial medications to all personnel deploying. Major challenges identified were: preparing individual prescriptions for the antimalarial drug, mefloquine, without significant disruption of base pharmacy operations; ensuring all personnel were appropriately screened and counseled on medication options for malaria prophylaxis, and received comprehensive information on this controversial therapy. A collective prescription protocol (CPP) was employed to delegate prescriptive authority to Pharmacy Officers and civilian pharmacists employed with the Department. This poster will outline how the CPP was implemented and how the pharmacists planned and executed this unique program to protect the health of those military personnel deployed to Afghanistan and enhanced the visibility of the pharmacist as a health care provider to the target group. This program successfully met its objectives and has been sanctioned by the Surgeon-General as a model for provision of medications to large numbers of personnel for future military deployments.

Improving The Quality Of Life – Renal Anemia Management Program

Rosanna Fernandes BSc (Hon), BscPhm, Soldiers' Memorial Hospital, Orillia Ontario

Anemia and its related comorbidities are major complications of renal failure. Treatment of renal anemia improves quality of life, cognitive function, enhances immune function and decreases left ventricular hypertrophy. Sustained increases in hemoglobin are associated with an overall reduction in patient mortality. Considering the consequences of anemia in the renal population, the clinical value of anemia management, and retrospective data analysis, a program to promote patient-specific renal anemia management (RAMP), was implemented.

The establishment of this pharmacy-based regional program for 5 hospitals included the design and development of a unique database, providing for monthly data analysis, distribution of statistics and long-term progress information. This data is critical in supporting the development; review and revision of protocols/ procedures for patient care managed by a multidisciplinary team and is fundamental to interventions and recommendations. A quality of life patient survey is use to measure improvement in quality of life.

The primary goal of RAMP is to ensure that those patients with hemoglobin below the recommended range (Canadian Society of Nephrologists' Guidelines) receive optimal and individualized treatment. Today, approximately 75-80% of onsite hemodialysis patients maintain hemoglobins within or above the range – this compares to approximately 40-55% when the program started.

The success of the program has resulted in: improved patient outcomes, continuous quality improvement, benchmarking, partnerships, national educational sessions and the integration of multidisciplinary teams. The pharmacist coordinator was awarded the 2002 Pharmacy Practice Commitment to Care Award – Hospital, for RAMP.

Olanzapine-Induced Acute Pancreatitis

Amy Flinn, BSc, BScPharm; Joel Lamoure, BScPharm, FASCP. London Health Sciences Centre, London, ON

Biliary tract disease and alcoholism account for ≥80% of hospital admissions for acute pancreatitis (AP). The remaining 20% are attributed to hyperlipidemia, structural abnormalities, vascular disease, trauma, and drugs. The clinical presentation of AP varies depending on the severity, and may include abdominal pain, distension, nausea, vomiting, fever, hyperglycemia, and elevated pancreatic enzymes. Although serum amylase levels are elevated in 75% of cases, it should be noted that serum amylase elevations do not correlate with the severity of AP. Macroamylasemia (the result of a complexed form of amylase that cannot be excreted by the kidney) and AP are both associated with high serum amylase, but macroamylasemia has no known clinical significance.

Drugs most often implicated in AP include azathioprine, estrogens, furosemide, sulfonamides, and valproic acid. Exactly how medications induce AP is unknown, but postulated mechanisms include immune-mediated inflammatory response, direct cellular toxicity, pancreatic duct constriction, arteriolar thrombosis, and metabolic effects. Atypical antipsychotic agents are commonly prescribed for the treatment of psychotic symptoms. Reports of AP associated with clozapine were first published in 1992, followed by more recent reports implicating the newer atypical agents such as olanzapine. A MEDLINE search from January 1995 to October 2003 identified 62 reports of AP associated with olanzapine use. The majority of these were adverse drug reaction reports received by the US FDA MedWatch program, but the reports did not appear to consider patient lifestyle issues such as alcohol consumption. Only 2 of the reports were documented case reports.

A case of a 16-year-old female with probable olanzapine-induced AP is presented here. As olanzapine is increasingly used in many patient populations for psychotic symptoms and agitation, it is important that pharmacists are aware of this clinically serious adverse effect.

What Interventions Work To Influence Clinicians' Prescribing Practices?

Grindrod K, BScPhm, Patel P, PharmD, Martin J, PharmD

Rationale: Evidence from research is not regularly accessed nor utilized by practitioners in their daily clinical practice and discrepancies exist between evidence and practice.

Objectives: To provide an objective overview of the effect of interventions aimed at influencing clinicians' prescribing practices.

Methods: A systematic search for English systematic reviews was performed in MEDLINE, CINAHL, EMBASE and the Cochrane Library using search terms in accordance with Cochrane recommendations. Included reviews were required

to clearly report a search strategy, inclusion and exclusion criteria, literature assessment criteria, methods for synthesizing information, and references. Two reviewers reviewed abstracts and studies for inclusion, assessed study quality and extracted qualitative data on interventions and their effects on prescribing practice.

Results: Thirteen systematic reviews were identified. Interventions shown to have an impact on prescribing practices included manual and computerized reminders, computer generated patient education materials, customized audit and feedback, computer-dosing assistance, and educational outreach visits combined with a social marketing approach. Clinical pharmacist interventions, including medication reviews and academic detailing, also had an effect. Ineffective interventions included passive dissemination of information, and didactic lectures alone. There was insufficient or variable evidence on local opinion leaders, interprofessional education, interactive on-line education, non-customized audit and feedback, mass media, patient mediated interventions, regulatory interventions such as formularies, local consensus processes, incentives, pre-printed orders, clinical pathways, practice guidelines and teaching critical appraisal skills.

In general, multifaceted interventions that addressed specific barriers appeared most effective. In particular, combinations of interventions such as academic detailing, education and feedback, repeated reminders, local consensus processes, patient-mediated interventions, and educational materials had an impact.

Conclusion: A number of interventions have been shown effective for changing prescribing behaviours. The most effective interventions appear to be multifaceted; however, more research is required to define optimal combinations of interventions.

An Explanatory Model To Describe The Role Of The Consulting Primary Care Pharmacist In A Family Physicians Office Setting

Natalie Kennie, PharmD[1,2] , Jana Bajcar, MScPhm, EdD, FCSHP1,[2] Tom Einarson, PhD[2]

[1]Department of Pharmaceutical Sciences, Leslie Dan Faculty of Pharmacy, University of Toronto. [2]Department of Family and Community Medicine, St. Michael's Hospital, Toronto, Ontario, Canada.

Rationale: Enhanced pharmacy services are expanding into ambulatory settings. The pharmacist's role and activities need to be defined in the context of the health care team if these new practices are to be evaluated and expanded into new sites.

Description: The objective is to develop an explanatory model of a clinical pharmacist practice model in a family practice setting.

Steps: A functional prototype of an inter-disciplinary primary care pharmacist practice in family practice was examined using a modified action research approach. A conceptual framework that delineates responsibilities of the patient and health team members in managing medications in primary care was used to gather data through: (a) initial retrospective reflection; (b) chart review of 100 patient assessments; and (c) and also concurrent daily reflections by the pharmacist on daily practice. Discussion among the research team and reflections were used to analyze and arrange the data to create the explanatory model. The model was presented to physicians and pharmacists for their review.

Result: The model consists of a description of 6 activities that provide collaborative support for medication-prescribing practice, 3 activities that support patient's medication-taking practice, and 1 activity that supports medication-dispensing practice. The model also defines 7 guiding principles that underlie the pharmacist's daily practice.

Importance and Implications: The study provides an explanatory model of a pharmacist's role in one particular interdisciplinary primary care team and also offers a framework that can be used by pharmacists who wish to expand their roles in other ambulatory care settings.

Seamless Care Initiative For Patients On Combination Antiplatelet Therapy

Ackman Margaret PharmD, Gordon Wendy PharmD, Kertland Heather PharmD, Kuntz Don B.S.P., Pickering Jennifer BScPhm, Thompson Ann BScPhm on behalf of the Canadian Cardiovascular Pharmacists Network(CCPN)/Réseau Canadien Des Pharmaciens Impliqués En Soins Cardiovasculaires (RCPC) Edmonton, AB

Clopidogrel is an antiplatelet agent that, in combination with ASA, is effective in patients undergoing PCI and those with non-ST elevation acute coronary syndrome. When patients are discharged home from the hospital on this combination, there can be disruptions in therapy for a variety of reasons including: advice from community pharmacist or family practitioner or the prescription may not be filled due to cost or provincial drug benefit coverage issues. For these reasons, a multi-faceted discharge kit has been developed that can be used to minimize disruptions in therapy upon patient discharge. The discharge kit includes: 1) three information sheets, for the patient, the community pharmacist and the family practitioner. These information sheets explain the rationale for combination therapy, projected length of therapy and answers to frequently asked questions. 2) Medication schedule – a formatted schedule that enables it to be individualized to patients medications 3) Province specific reimbursement strategy – information sheets reviewing how reimbursement can be obtained for these indications including a standard template form for provincial drug benefit reimbursement. All components are available electronically so that it can be adapted to hospital specific requirements. The aim of this discharge kit is to allow hospitals to have a choice of tools that can facilitate the transition of a patient from the hospital to home in a format that is readily adaptable. The long term goal is ensure that patients who would benefit from the combination antiplatelet therapy receive it in a seamless manner after discharge.

Pharmacy Experience With Severe Acute Respiratory Syndrome At The Scarborough Hospital.

Archie Kwan BSc.(Pharm), Carmen Lai BSc.Phm., Helen Lock BSc.Phm, Karen Wong BSc.Phm, Patricia Macgregor BSc.Phm. The Scarborough Hospital (General and Grace Divisions). Toronto, ON.

Severe acute respiratory syndrome (SARS) is a new respiratory disease that has infected over 8,000 people worldwide. As of July 10, 2003, a total of 438 cases of SARS were reported in Canada with a 13.3% case-fatality rate. The purpose of this poster is to share our experience as one of the first hospitals in Toronto affected by SARS.

The Scarborough Hospital (TSH) is a two-site community hospital system comprising of the Grace division (250 bed) and the General division (400 bed). The hospital outbreak started with the first SARS patient admitted at the Grace division on March 7, 2003. SARS spread within the hospital (to staff, patients and visitors) and eventually led to closure of

hospital services from March 25 to June 5. Other surrounding hospitals were infected due to patient transfers. The World Health Organization placed a travel advisory warning on Toronto from April 23 to April 30.

During the SARS outbreak, the TSH pharmacists were involved in activities such as SARS protocol development, special access drug procurement (intravenous Ribavirin), drug preparation ("prophylactic drugs" and SARS intubation kit), patient monitoring, adverse drug reaction reporting and patient education. As well, pharmacists had to cope with the additional stress attributed to staff illness and emotional strain from working in a higher risk environment.

The SARS experience has aided TSH in identifying its vulnerabilities in dealing with an unknown illness and infection control procedures. Working together to minimize future spread of SARS has become TSH's top priority.

Review Of 34 Probable Severe Acute Respiratory Syndrome Patients Administered Intravenous Ribavirin.

Archie Kwan BSc.(Pharm), Carmen Lai BSc.Phm., Vincent Pang BSc.Phm, Patricia Macgregor BSc.Phm. The Scarborough Hospital (Grace and General Divisions). Toronto, ON.

Severe acute respiratory syndrome (SARS) is a new world-wide disease with significant morbidity and mortality (reported 13.3% case-fatality). On March 7, 2003 an undiagnosed SARS patient was admitted to the Scarborough Grace hospital in Toronto. Subsequently, SARS spread to hospital staff, patients, visitors and other institutions. At the time of the outbreak, the diagnosis and treatment of SARS was unknown. Initial treatment guidelines include emperic intravenous ribavirin (2 grams stat, 1 gram q6h for 4 days, then 500mg q8h for 3 days).

Objective: To monitor and review patients administered intravenous ribavirin therapy.

Methods: We prospectively compiled clinical information on all probable SARS patients admitted and treated at The Scarborough Hospital (Grace and General Divisions) with intravenous ribavirin between March to April. We excluded data from patients whom received ribavirin for less than 48 hours and/or transferred to another institution.

Results: A total of 34 patients were included for review, 21 females, 13 males, mean age 54 years (17-88). Findings include: 6 deaths (18%), decrease in hemoglobin of more than 2 g/dL occurred in 24 (71%) patients, evidence of hemolytic anemia in 21 (62%) patients and 11 patients (32%) received blood transfusion. Electrolyte abnormalities and alopecia were noted and reported to Health Canada.

Discussion: On April 27, Health Canada announced excluding ribavirin from the treatment guidelines for SARS. They site lack of in vitro effect against SARS coronavirus at therapeutic concentrations and the potential to cause severe adverse effects. The Scarborough Hospital spent a total of $333,216 on intravenous ribavirin therapy.

The Use Of Drotrecogin In The Management Of Sepsis In Fraser Health, BC.

Dr. Anisha Lakhani B.Sc.(Pharm), Pharm D, Dr. Shallen Letwin B.Sc.(Pharm), Pharm D, Dr. Anthony Taddei B.Sc.(Pharm), Pharm D, Mits Miyata B.Sc.(Pharm), Bob Nakagawa B.Sc.(Pharm), FSCSHP, Fraser Health Authority, British Columbia, Canada

Rationale: Formulary approval for drotrecogin was based on a single randomised, controlled trial. Concerns were raised about its safety and benefit in a large and diverse community setting. A multidisciplinary team defined the usage criteria and appropriate controls were put in place to ensure compliance.

Objectives: To determine if patients met the usage criteria and to evaluate outcomes such as bleeding complications, mortality and length of stay.

Design and Methods: A prospective, observational evaluation.

Results: In a period of 10 months, drotrecogin use was considered in 10 patients. Eight patients received the drug and 2 were unsuitable for therapy due to contraindications. In the group that received the drug (n=8), the mean age was 53.3 years and the mean APACHE II score just prior to therapy was 28.7. Three patients (37.5%) had a defined source of infection and the rest were culture negative. However, all patients were deemed to have suspected infections. Four patients completed the full 96-hour infusion. Reasons for not completing therapy included bleeding (n=1), death prior to completion (n=1) and change in diagnosis (n=2) to vasculitis and severe cardiomyopathy. The mortality rate within seven days of treatment was 50% and major bleeding rate (during infusion) was 37.5%.

Conclusion: All of our patients met the approved criteria for drotrecogin at the beginning of the infusion. However only 4 patients completed the therapy. Both the mortality and major bleeding rates in our patients were high. Further experience is required to delineate benefits of this drug in a community setting.

Probable Linezolid-Induced Pancytopenia

Nita Lakhani BScPhm, William Thompson MD FRCP(C), Anne Marie Bombassaro BScPhm PharmD, London Health Sciences Centre, London, Ontario

Rationale

A case of pancytopenia associated with linezolid therapy is presented. A Medline search revealed 3 similar cases. As of April 30, 2003 the Canadian Adverse Drug Reaction Monitoring Program had received no reports of this adverse effect. The World Health Organization had received 37 cases worldwide as of July 2003. The severity of this event reinforces the need to identify incidence and risk factors.

Case

A 75-year-old male outpatient with cardiac disease, diabetes and chronic renal insufficiency with iron-deficiency anemia was prescribed linezolid 600mg twice daily for a methicillin-resistant staphylococcus aureus foot infection. At one-week follow-up his blood cell counts were consistent with baseline values. He failed to return for subsequent blood work. On day 26 of therapy he was admitted to hospital with acute renal failure, likely due to dehydration. The patient had petechiae and was pancytopenic (erythrocytes 2.5 X 10e12/L, leukocytes 2.9 X 10e9/L, platelets 59 X 10e9/L, hemoglobin 71g/L). He was transfused and linezolid was discontinued. Blood counts improved over the week and remained at baseline 2 months afterward.

Analysis

The decline in blood counts from baseline met previously established criteria for clinical significance. Application of the Naranjo scale for adverse reactions indicated a probable relationship between pancytopenia and linezolid.

Importance

Pharmacists should be aware of this rare effect with linezolid and prospectively identify patients with co-morbidities placing them at increased risk. The importance of weekly hematologic monitoring should be emphasized to patients. Limiting the quantity dispensed at any one time may also be considered.

Determining The Importance Of Different Features Of Therapeutic Information In Seniors With Type 2 Diabetes

Elaine Lau, BScPhm, PharmD Lisa Dolovich, BScPhm, PharmD, MSc, Deborah Marshall, PhD Lehana Thabane, PhD for the TIPPS group, Centre for Evaluation of Medicines, St. Joseph's Healthcare, Hamilton, ON

Background/Rationale:

Therapeutic information directed at patients is often developed without considering the patient's perspective and thus may not fully meet their needs.

Objective:

The objective of this study was to elicit the importance that seniors with diabetes place on different features of written therapeutic information.

Design:

Cross-sectional mailed survey

Methods:

A survey depicting 14 features of written therapeutic information (e.g. use of pictures, amount of detail) was developed based on a literature review and focus group discussions. Features were assigned 2 to 4 levels (variations in features; e.g. pictures vs. no pictures, more vs. less detail). Community-dwelling seniors (≥65 years of age) on medications for type 2 diabetes rated the importance of each feature on a 7-point Likert scale and indicated their preference for each level.

Results:

Completed surveys were available for 74/88 (84.1%) patients. The mean age of patients was 73.0 (SD = 4.5) years and 55.2% were female. Patients rated the amount of side-effect information as most important (mean ± SD importance rating = 5.6±1.4), followed by readability (5.5±1.4), and amount of explanation given (5.2±1.3). The majority of patients preferred to have more (94.4%) vs. less (5.6%) explanation about their medications, to have the information source disclosed (86.1%) vs. having it be anonymous (13.9%), and to have practical examples given about how to use their medications (79.2%) vs. not being told explicitly what to do (20.8%).

Conclusions:

There were marked differences in importance ratings of the features of therapeutic information reported by this group of patients. Patients may choose to read different types of information depending on what features are incorporated. The results of this study can help to better meet patients' information needs by informing the development of written therapeutic information that incorporates their perceptions of importance.

Tuesday, February 3, 13:45 – 14:30 • Sheraton Hall

Utility Of Anti-Xa Monitoring In Children Receiving Enoxaparin For Therapeutic Anticoagulation

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Rationale

Although enoxaparin is commonly used in the treatment of thromboembolism in children, current treatment guidelines are largely extrapolated from adults.

Objectives

The objectives of this study were to determine: i) correlation between enoxaparin dose and anti-Xa level; ii) intra-patient variability; iii) whether dose or anti-Xa level is a predictor of outcomes.

Study design

A retrospective chart review was conducted on all hospitalized patients receiving enoxaparin in a tertiary care pediatric institution. Excluded were patients >19 years or whose records were not available. Simple linear regression, coefficient of variation (CV), and Student's t-test were used to analyze the objectives.

Results

Eighty treatment courses with interpretable anti-Xa levels were analyzed. Mean patient age was 6.5 years. Mean enoxaparin dose was 1.10 mg/kg q12h. Correlation between empiric dosing and anti-Xa level was poor, R2=0.0307 and 0.0237 for patients >2 months with and without cardiac/renal diseases, respectively. 4/7 of patients ≤2 months of age compared to 4/32 of patients >2 months had a CV>40%. Similarly, 4/12 of cardiac patients compared to 4/27 of non-cardiac patients had a CV>40%. Neither dose nor anti-Xa level predicted treatment success or adverse reactions (p>0.05).

Conclusions

These results suggest a need to reexamine the use of anti-Xa levels for guiding enoxaparin therapy. Further prospective

studies are warranted to clarify whether routine or selective anti-Xa monitoring should be recommended in pediatric patients.

The Nature Of Preventable Adverse Drug Events In A Long Term Care Hospital

Lawrence Jackson BScPhm, John Papastergiou BScPhm, Sonia Sen-Roy BScPhm, Artemis Diamantouros BScPhm, MEd., Victoria Hsu BScPharm, Edward Kung BScPhm., Sunnybrook & Women's College Health Sciences Centre, Toronto, Ontario

Rationale:

Preventable adverse drug events (pADE) have been defined as an undesired reaction to medication, which may have been prevented by appropriate drug selection or management. Utilizing the expertise of a pharmacist in identifying and resolving drug-related problems (DRPs) during the periodic medication review (PMR) is proposed as a systems improvement to reduce inappropriate drug therapy and prevent ADEs.

Objctives:

To study the nature of therapeutic interventions that pharmacists made at the time of a PMR. To study, in terms of pADEs, the impact that pharmacists have on the quality of patient care through the PMR process.

Methods:

A structured therapeutic thought process was used and an intervention documentation form developed, based on the DRP categories from the Leslie Dan Faculty of Pharmacy. Data was collected for the PMR of December 2002 and analyzed using SPSS software.

Results:

A total of 464 interventions were made on 229 patients. Interventions included deletion (46.1%) or addition of drugs (18.1 %), recommendation of laboratory monitoring (16.8%) and dosage or frequency adjustments (14.6 %). The AHFS drug classes most often implicated were CNS (20.9 %), gastrointestinal (18.1 %), skin and mucus membrane agents (13.6 %) and cardiovascular drugs (7.5 %). In this study 45.8%, 26.7% and 17.5% had 1, 2 or more than 3 DRPs respectively.

Conclusions:

Pharmacists identified a significant number DRPs. Their resolution is expected to significantly lower the likelihood of preventable ADEs.

Quality Improvement Using The Collaborative Model For Change: Experience From A Pain Collaborative Project

John Papastergiou BScPhm, Lawrence Jackson BScPhm., Sunnybrook & Women's College Health Sciences Centre,Toronto, Ontario

Rationale:

A recent patient satisfaction survey indicated that pain was poorly controlled at our institution. The concept of quality improvement requires that specific changes be made to current processes to lead to significant and sustainable improvements in patient care. The collaborative model for change, described by the Institute for Healthcare Improvement (IHI), has demonstrated that interdisciplinary teams working together on a specific issue can bring about improvements on a small scale quickly.

Objectives:

To determine the utility and applicability of the IHI model in implementing changes in the pain management process. The aim was to reduce noncancer chronic pain in elderly patients on a 33-bed physical support unit in a complex continuing care hospital and to improve pain awareness among staff.Methods:

An interdisciplinary team proposed and tested change ideas, which were initiated on a small scale and then expanded to the entire unit. Change ideas included 1) switching as needed analgesic orders to regularly scheduled analgesics. 2) documentation of serial pain control attempts at team rounds, 3) a poster, describing the impact of pain on the elderly, and 4) a booklet to educate the patient/family about pain. The primary outcome measurement was the change in the percent of patients reporting moderate pain daily or severe pain at any time as documented on the Minimum Data Set (MDS) pain section.

Results:

The combined interventions resulted in a 42% decrease in the number of patients reporting moderate pain daily or severe pain at any time. Increased staff awareness resulted in pain being added as a fifth vital sign.

Conclusions:

The model produced substantial enduring changes in the pain management process, resulting in improved patient care and satisfaction.

Gatifloxacin Drug Use Review: Indication And Adverse Drug Reactions

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Rationale:

Gatifloxacin is approved for use in the Community Acquired Pneumonia (CAP) Pathway at this institution. Costs for respiratory quinolones have increased in 2002-03 from 2001-02, perhaps due to non-pathway use. Adverse drug reaction reports were linking gatifloxacin with hyper- and hypglycemic reactions. A review was undertaken to examine the indication and safe use of gatifloxacin.

Objectives:

To collect data including the indication, dosing, route, possible adverse drug reactions and interactions during gatifloxacin therapy.

Methods:

Charts were concurrently reviewed for 102 patients from July to August 2003.

Results:

The indication was CAP in 40/102 cases. Other diagnoses were nosocomial or aspiration pneumonia, acute exacerbation of COPD, and sepsis. Dose adjustments for renal impairment were not made in 18 patients. Hyperglycemia alone was observed in 19 patients, hypoglycemia alone in 2 patients, and 5 patients experienced both. Seventeen of these glucose disturbances were classified as severe (blood glucose > 15 or < 3 mmol/L). Concomitant therapy with drugs that potentially interact with gatifloxacin was seen in 70% of patients.

Conclusions:

The review confirmed that gatifloxacin was frequently being prescribed outside the institution's CAP pathway and severe

glycemic reactions had occurred. Recommendations to improve the safe and cost-effective use of gatifloxacin at this institution include assessing the apropriateness of the indication and monitoring blood glucose at least once daily for all patients.

A Pharmacokinetic Study Of The Administration Of Gentamicin In Pre-Term And Term Neonates: The Development And Validation Of A Nomogram

Mona Mourad, B.Pharm., Christina Russo, B.Pharm., Hala Yazbeck, B.Pharm., Sylvie Carle, MSc, Louis Chartier, MSc, Yves Rousseau, MSc, BCOP, Keith Barrington, MD, MB ChB, MRCP (UK), FRCP (C). McGill University Health Center, Montreal. Claudine Laurier, PhD, Faculty of Pharmacy, University of Montreal, Montreal.

Gentamicin is one of the most widely prescribed medications in the neonatal intensive care unit (NIUC). There is no consensus on the dosage regimen required to attain adequate serum drug levels (SDLs) and several nomograms exist in the literature.

The objective of the study was to develop a nomogram for the administration of gentamicin in neonates hospitalized in the NICU of the Royal Victoria Hospital (RVH) and to evaluate its impact on the achievement of target SDLs.

This study is a two-phased study. Phase I is a retrospective review of hospital records of neonates hospitalized in the NICU of the RVH, followed by the elaboration of a dosing nomogram based on computed pharmacokinetic parameters. Phase II is a pre-post study with a historical control group comparing patient SDLs before and after the implementation of the nomogram.

Phase I included 129 patients and 25 patients were enrolled in Phase II. After the creation of the nomogram, a correlation coefficient (r2) of 0.38 was found between gestational age (GA) and the optimal dose for each patient. In phase II, patients in the post group were 4.1 (CI 95% [1.6-10.7]) times more likely to have therapeutic peaks and troughs than those in the pre group. For therapeutic peaks alone the odds ratio (OR) was 3.3 (CI 95% [1.0-10.6]) and for therapeutic troughs, the OR was 2.2 (CI 95% [0.7-6.5]).

In conclusion, the created nomogram based on pharmacokinetic parameters of neonates, achieves better therapeutic SDLs than the dosing regimen previously used at the RVH.

The Search For An Interactive Hospital Computer Program For The 21st Century

Yanic Péan, Bsc, Bsc Pharm; Sylvie Carriere; Julie Lalonde. Montfort Hospital, Ottawa, ON

Rationale:

The role of a pharmacist in providing direct patient care has evolved considerably in the last several years. In order to assume their responsibilities, pharmacists are looking for integrated computer systems that provide leading edge information technology, and clinical decision support tools that ensure efficacy and safety.

Objectives:

To implement integrated software that continually evolves in order to enable pharmacists and other clinicians to orchestrate and deliver patient care in a safe, effective and efficient manner.

Process:

A statement of requirements was created in order to assess four computer systems as well visits of two hospitals were organized to evaluate systems in practice. The six-month project was assigned to 1 pharmacist and 1 technician. The MEDITECH MAGIC VERSION 4.8 was selected, after which, the pharmacy core team (1 pharmacist, 2 technicians) attended a 4-day training session Boston, and other pharmacy personnel attended 10 training sessions. A training manual, pharmacy-Nursing committee, and information sessions for nurses and physicians were created to facilitate implementation.

Outcome:

The Meditech system has been successfully implemented in our hospital, and feedback has been positive. The program offers many features: drug-drug interactions, laboratory results, patient information sheets, a weekend pass module, and the flexibility to prepare bilingual labels. The software also "flags" patient allergies and medication duplications, monitors the medication dose range, and has the ability to generate numerous reports.

Discussion:

Meditech offers many advantages over our previous computer system. It offers administrative and clinical tools, which have yet to be fully implemented.

The Impact Of Pharmacist-Provided Education On Initiation Of Osteoporosis Treatment Following Fragility Fractures

Karen Riley BScPhm, Pharm D[1,2] Janet Martin Pharm D[2], Lori Wazny BScPhm, Pharm D[2];

[1]Lambton Hospitals Group, Sarnia ON,
[2]London Health Sciences Centre, London, ON

Rationale: Less than 20% of fracture patients with osteoporosis have been reported to receive investigation and treatment.

Objective: To evaluate whether increasing patient, nurse and family physician awareness about osteoporosis had an effect on initiation of osteoporosis treatment following fragility fracture after hospital discharge.

Methods: Subjects consisted of a historical cohort of 33 patients and 33 patients in a prospective intervention group admitted to a community hospital with a diagnosis of a fragility fracture. Intervention group patients received education from the pharmacist about osteoporosis. Patients in both groups received a follow-up phone assessment 6 months after the initial hospitalization. The main outcome measures were the number of patients who received bone mineral density (BMD) tests, and who were initiated on treatment for osteoporosis.

Results: No significant difference was observed between the groups in the number of BMD tests ordered (p=0.49), however, significantly more patients in the pharmacist intervention group were initiated on treatment for osteoporosis at six months following fragility fracture (p=0.001).

Conclusions: Pharmacists providing education about osteoporosis to patients, nurses and family physicians significantly increased the number of patients receiving treatment for osteoporosis following fragility fracture.

Key words: osteoporosis, education, pharmacists, drug therapy

Retrospective Analysis Of A Pharmacist-Directed Warfarin Program In A Long-Term Care Setting Over A 5-Year Period

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Background:

Since 1998 a pharmacist-directed warfarin dosing program has existed in our 545-bed long-term care facility. Pharmacists are responsible for writing orders for warfarin dosages and INR determinations.

Objectives:

To determine the effectiveness at keeping INRs in the therapeutic range and quantifying the amount of thromboembolic and bleeding events and their relationship to non-therapeutic INRs.

Methods:

Data from warfarin monitoring forms were collected; data included demographics, therapy duration, total number of INRs, number of INRs in the therapeutic range, any thromboembolic or bleeding events documented and the INR at the time. Data was analyzed using SPSS software.

Results:

Data from 218 patients (mean age 80.6) over the last 5 years was analzyed. Mean duration of therapy was 131.8 days. Mean number of INRs measured per patient per month was 5.7. Mean percent of INRs inside the target range (2.0-3.0) per patient was 42.2%. For patients with a long duration of therapy (> 6 months) it was 47%. Mean percent of INRs inside an extended target range (1.8-3.2) was 56.1% (63% for long duration). Mean percent of INRs >3.5 per patient was 10.9% (6.7% for long duration). Mean % INRs >6 per patient was 2.1% (1.5% for long duration). In total, there were 5 major bleeds (2 correlated with an INR >3), 18 minor bleeds (5 correlated with an INR>3), and 3 thromboembolic events documented (none correlated with INR<2).

Conclusion:

Pharmacists were effective in keeping the majority of INRs in an extended target range for patients with long therapy durations. There were low rates of supratherapeutic INRs and bleeding/thromboembolic events. The majority of adverse events were not correlated to a nontherapeutic INR.

Development, Implementation And Evaluation Of Venous Thromboembolism Prophylaxis Guidelines For General Medicine Patients

Fatima Sunderji Bsc.Phm, Jin Huh Bsc.Phm, Olavo Fernandes Bsc.Phm, Erik Yeo MD FRCP, Daniel Panisko MD FRCP, University Health Network, Toronto, Ontario

Rationale:

Venous thromboembolism (VTE) is a known cause of morbidity and mortality for general medicine patients. It has been shown that pharmacological prophylaxis significantly reduces both the occurrence of deep vein thrombosis (DVT) and pulmonary embolism (PE) in general medicine patients. However, VTE prophylaxis is widely under-used for this patient population.

Objectives:

To develop and implement VTE prophylaxis guidelines and evaluate percentage of general medicine patients who receive pharmacological VTE prophylaxis prior to and after implementation of VTE prophylaxis guidelines.

Study design and methods:

A prospective, observational, before and after study divided into three phases. Phase I was a review of literature to develop VTE prophylaxis guidelines and phase II involved implementing VTE prophylaxis guidelines at our institution. Phase III was conducted to determine the impact of guidelines on practice by comparing percentage of patients with appropriate indications who receive VTE prophylaxis pre and post implementation of guidelines.

Results:

During phase III, we screened data for 217 patients in the pre phase and 262 patients in the post phase. Eighty-two patients in the pre phase and 76 patients in the post phase were candidates for VTE prophylaxis. The percentage of appropriate patients who received VTE prophylaxis increased significantly from 11% in the pre phase to 80% in the post-implementation ($p<0.05$).

Conclusion and implications to practice:

The implementation of institution-specific guidelines resulted in a significant increase in the utilization of VTE prophylaxis. More importantly, this increase was significant for subgroups of patients presenting with high risk factors and high-risk medical conditions. The results of this study demonstrate the impact of formal written guidelines on clinical practice.

A Randomized Trial Of Patient Self-Managed Versus Physician-Managed Oral Anticoagulation

Rubina Sunderji, Pharm.D., FCSHP, Kenneth Gin, M.D., FRCPC, Karen Shalansky, Pharm.D., FCSHP, Cedric Carter, M.B., FRCPC, Keith Chambers, M.D., Cheryl Davies, R.N., Linda Schwartz, R.N., Anthony Fung M.B, FRCPC, Vancouver General Hospital and University of British Columbia, Vancouver, BC, Canada

Rationale: Patient self-management of warfarin is an attractive model particularly if it improves anticoagulation control and can be done safely under minimal physician supervision.

Objective: To compare self-management (SM) with traditional physician-managed (PM) anticoagulation.

Methods: This was a randomized, open-label 8-month trial. Patients 18 years or older were eligible if they were receiving warfarin for at least 1 month prior to enrolment and required anticoagulation for at least 1 year to a target international normalized ratio (INR) of 2.0 to 3.0 or 2.5 to 3.5. Exclusion criteria were known hypercoaguable disorder, mental incompetence, language barrier or inability to attend training sessions. Patients randomized to SM tested their INR with a point-of-care device and adjusted their warfarin doses using a nomogram. Patients randomized to PM received usual care from their general practitioner. The primary outcome was anticoagulation control.

Results: One hundred and forty patients were randomized (70 per group). Based on intention-to-treat analysis, there was no difference in proportion of INR in range (SM 64.8% vs PM 58.7%, p=0.23) and time in target range (SM 71.8% vs PM 63.2%, p=0.14). Patients managing their own therapy spent less time below the therapeutic range (15.0% vs 27.3%, p=0.04). There were 3 major complications of thrombosis or bleeding, all in the PM arm. All patients who completed SM preferred to continue with this strategy.

Conclusion: In our study population, self-management of warfarin was feasible and appeared to be safe as there were no serious adverse events.

Development Of A Consolidated Pharmacy Intranet Site At St. Michael's Hospital

Rosemary Tanzini, BScPhm and Andrea Ryl, BScPhm, St. Michael's Hospital, Toronto, Ontario

Rationale

There was a recognized need to consolidate and improve accessibility of various hardcopy and electronic sources of drug-related information.

Description

The primary goal for developing a readily accessible database of drug information was to support today's health care professionals in making more informed patient-care decisions by having current, accurate information available at the point of care.

To achieve these goals, a section of the hospital intranet was dedicated to drug and pharmacy-related information, and a database and dynamically driven intranet site was designed.

Sequential Steps/Methodology

St. Michael's Hospital partnered with a third party specializing in web design and used a four phase methodology:

i. Analysis
ii. Design
iii. Development
iv. Deployment

Critical success factors for this project include a thorough approach for planning and testing and a working group with expertise in web technology, workflow analysis and library organization skills. User feedback was obtained at various stages. A key words assignment approach was used to increase relevance of search results.

End Result

Information was organized into five main sections:

(i) Drug Database
(ii) Document Library
(iii) Pharmacy Services
(iv) What's New
(v) Electronic Resources

Importance and usefulness:

- Promote effective prescribing and use of medications to improve patient outcomes, minimize adverse events and reduce drug expenditures
- Facilitate immediate implementation and dissemination of hospital approved drug-related guidelines, protocols and formulary decisions

Pharmacy-Nursing Psycho-Educational Teaching At A Psychiatric Day Program At The Montfort Hospital

M.H. Truong, BSc Pharm; Mariette Vaillant-Gauvreau, RN, Montfort Hospital, Ottawa, ON.

Background:

In 2002, a pharmacy-nursing partnership was established for the psycho-educational teaching of patients enrolled in a psychiatric day program. Lack of understanding and medication fears were identified as notable impediments to medication adherence.

Patients were referred to psycho-education by psychiatrists or nurses.

Course Design:

Prior to the start of the course, the nurse documented the patient's psychotherapy. Course content was fine-tuned based upon the information gathered. The course focused on the main mental illnesses, drug therapy, adverse effects of medication and their management. Emphasis was also placed upon weight gain, nutrition, exercise and communication. Patients were expected to complete the five 1.5 hr sessions.

Method Of Evaluation:

A short survey, completed at the end of each session, provides feedback as to the patient's level of understanding and awareness. A questionnaire assessing comprehension/satisfaction was filled out at the end of the course.

Results:

Seventy-eight patients were enrolled, 63% of whom completed the course. Questionnaire results yielded an 82% and 86% positive response in the areas of drug comprehension and pharmacological treatment accountability. Among the graduates, 63% found the course to be somewhat to very useful, 33% were non-responders and 4% found it a waste of time.

Conclusion:

These results, as well as positive verbal feedback from participants and nursing staff, led to a restructuring and expansion in 2003. It is now a compulsory course comprising of eight, 1.5hr sessions, taught by 2 nurses and a pharmacist.

Wednesday, February 4, 10:15 – 11:00 • Grand Ballroom Foyer

Drug Utilization In The Canadian Armed Forces

L Col Régis Vaillancourt, Bpharm, PharmD, Eden d'Entremont, BSP, Alan Gervais, BSP, Maj Dave Cecillon, BSc Chem, BSc Pharm, Pharm D, Directorate of Medical Policy, Pharmacy Policies and Standards, Canadian Forces Health Services, Ottawa, ON

Objective:

To describe drug utilization by members of the Canadian Forces (CF) and compare it to the Canadian civilian population.

Method:

CF procurement data for the 2002-2003 fiscal year was obtained from McKesson Canada to assess drug utilization in CF members. IMS Health Canada provided prescription data from Canadian retail pharmacies for the same period. Data from both was sorted into three reports: total cost of

prescriptions according to therapeutic class, top 20 active ingredients by number, top 20 active ingredients by value. It was then analyzed to compare drug usage among the military and civilian populations.

Results:

Drugs for cardiovascular disease are the most widely used agents followed by drugs for psychiatric disorders for both military personnel and civilians. The top 10 therapeutic classes are similar for both groups, although the order in which they appear does vary. OTC medications appear much more frequently among the most commonly used active ingredients by the military population. Cardiovascular medications represent 8 of the top 20 expenditures by civilians, compared to 4 of the top 20 in the CF population.

Discussion:

Notable differences in drug usage exist between military personnel and the civilian population in the rate of OTC usage, expenditure on sildenafil and expenditure on psychiatric medications. These differences may be attributable to CF formulary restrictions as well as differences in population demographics and data collection.

The Evolution Of Experiential Learning For Canadian Forces Pharmacists

LCol R Vaillancourt Pharm. D., F. Hall BSc Pharm, MBA, Deputy Chief of Staff Medical Policy Pharmacy Policy and Standards, Canadian Forces, Ottawa, ON.

Canadian Forces pharmacists are faced with unique challenges related to maintenance of clinical skills. Innovative solutions are required to address the gaps identified.

The concept of maintenance of clinical skills program was initially formalized in 1997 to support operational readiness. The Canadian Forces have also downsized over recent years and moved to a new Health-Care delivery model. Pharmacy officers can no-longer experience tertiary- care services within a Canadian Forces facility and now require to complete rotations in Civilian health care facilities.

Any experiential training program designed required to address both the skills gaps identified and pertinent disease states and therapeutics. These areas were validated from a number of information sources of the Canadian Forces. It was also a priority to ensure care of Canadian Forces members both in-garrison and on deployment, comparable to that in the civilian sector.

The requirements of operational readiness served as the initial driving forces for the concept of the maintenance of clinical skills. Once in place the rotations acted as a catalyst to identify other areas of practice within the clinical skill spectrum.

This has resulted in a number of initiatives such as re-evaluation of the Canadian Forces Pharmacy Residency program, alternate rotation selection for the maintenance of clinical skills and exploration of the options for credentialing for certain disease states. All these initiatives are intended both to support operational readiness and enhance care of CF members.

The intended Outcomes of the program are:

- Increased operational readiness
- Enhanced care of CF members
- Retention of officers
- Development of expertise within the CF

Symptom Resolution Of Common Ailments Treated With Over-The-Counter Medications Provided Directly By Community Pharmacists

LCol Régis Vaillancourt, BPharm, PharmD. Michel Trottier, BScPhm. Janice Ma BScPhm, PharmD. Alan Gervais, BSP. Deputy Chief of Staff Medical Policy, Pharmacy Policy and Standards, Canadian Forces, Ottawa, ON. Rosemin Kassam, BScPharm, PharmD,University of British Columbia, Vancouver, BC.

Rationale:

In an earlier pilot project, patients were provided with an information card which enabled them to obtain non-prescription, over-the-counter (OTC) medications directly from a community pharmacist. However, because OTC medications may be limited in their efficacy, symptom resolution may be suboptimal, or may vary according to the condition treated. A sub-analysis of the data was thus performed to determine the effectiveness of eligible OTC products in resolving symptoms for minor common ailments.

Objective:

To determine if the effectiveness of symptom resolution varied among therapeutic classes of OTC medications obtained directly from a pharmacist.

Methods:

Patients who obtained an eligible OTC medication were contacted within 8 weeks to participate in a telephone survey. Survey results were analyzed to determine treatment outcomes as reported by the patients. Results were grouped in 4 drug classes: analgesics; antihistamines; cough and cold; and other.

Results:

Between May 1, 2002 and March 31, 2003, a total of 334 OTC medications were dispensed during 263 direct encounters with a community pharmacist. Overall, patients reported complete resolution, partial resolution and no improvement of their symptoms 84%, 15% and 1% of the time, respectively; no patients reported worsening of their symptoms with OTC treatment. Similar results were observed among the 4 different drug classes.

Conclusions:

Patients experienced a high rate of symptom resolution, regardless of the type of ailment being treated. OTC medications, provided directly by a community pharmacist, are effective in relieving symptoms of common ailments in most patients.

Pre-Testing Of Pictograms Used In Medicines Dispensed In Missions Of Humanitarian Relief

LCol Régis Vaillancourt, BPharm, Pharm D; Directorate of Medical Policy, Pharmacy Policies and Standards, Canadian Forces Health Services, Ottawa, ON, Kath Ryan PhD; Gordon Becket, Sulakshi de Silva, School of Pharmacy, University of Otago, New Zealand

Rationale:

The Canadian Forces Disaster Assistance Response Team (DART) provides health services during humanitarian relief missions. The recipients of health care during these deployments often do not speak English, French, or Spanish; many are also illiterate. This presents serious problems for communicating medication use.

Objectives:

To assess the effectiveness and comprehensibility of medication label pictograms among non-English speaking people. To determine the cultural appropriateness of the images used in such pictograms.

Study Design:

For each of three different ethnic populations, a focus group was convened. Each focus group consisted of 6-8 participants with a diverse range of education, literacy, and occupations. Discussion was facilitated by and interpreter, and individual interviews were used to determine responses to each pictogram.

Results:

Some pictograms were understood by all ethnic groups. Other must be redesigned either to address cultural values or allow greater comprehension.

Importance:

The findings will help to create pictograms, which are suitable for general use in non-English populations. These universal pictograms will help to enhance the provision of health care during humanitarian missions.

Pictographic Instructions For Medications: Do Other Cultures Interpret Them Accurately?

LCol Régis Vaillancourt, BPharm, PharmD; Deputy Chief of Staff Medical Policy, Pharmacy Policies and Standards, Canadian Forces Health Services, Ottawa, ON, Rosemin Kassam, PharmD, Faculty of Pharmacy University of British Columbia, Vancouver, BC.

Background:

Dispensing medication is a major service provided by Canadian Forces humanitarian relief missions around the world—often in developing countries. This study tested a set of sixteen pre-developed pictograms to determine whether they accurately communicated the written directions found on medication labels to ethnic respondents who neither speak nor read English, French or Spanish.

Objective:

1. To determine whether ethnically diverse individuals could understand the pictogram meanings without additional aids such as verbal instructions or explanations, and
2. To identify appropriate modifications to the pictograms to reduce interpretation errors.

Method:

Both qualitative and quantitative methods evaluated the pictograms' interpretability among three ethnic groups; Cantonese, Somali and Punjabi. Standard ANOVAs tested for differences due to ethnicity and other demographics. Results: Only four of the 16 initial pictograms tested were interpreted correctly by 80% of participants. Relaxing the criterion from 80% to 50% included eight more. Modifications to problem icon elements further improved interpretation accuracy levels by 22% for a 'best-of-three' tally of 67.15%. Quantity errors were twice as common as timing, administration route or auxiliary instruction errors.

Conclusions:

Participants could identify particular pictographic symbols they found confusing or ambiguous. Basic education and time since immigration predicted interpretation accuracy better than ethnicity or any other demographic characteristic.

Use Of Gastric Acid Suppressants Among Users Of Antidepressants In The Canadian Forces

Régis Vaillancourt, BPharm, PharmD. Janice Ma, BScPhm, PharmD. Deputy Chief of Staff Medical Policy, Pharmacy Policy and Standards, Canadian Forces Health Services. Ottawa, ON; J.Sampalis, MSc, PhD; JSS Medical Research Inc., Montréal, QC.

Rationale:

In vitro studies and database analyses suggest that gastric bleeding may be increased due to antiplatelet effects from serotonin reuptake inhibitors. However, antidepressants can cause other gastrointestinal effects for which suppressants of gastric acid (SGA) are prescribed. To date, there is no information to describe SGA use overall following antidepressant prescribing in a general adult population.

Objectives:

To determine if prescribing of SGA increases upon initiation of antidepressant therapy, and to compare usage rates of SGA among the different antidepressant classes.

Methods:

A retrospective analysis was performed of pharmacy records from Canadian Forces memebers who received any antidepressant (excluding buproprion for smoking cessation) between 1998 and 2002. Relative risk of use of SGA prior to and after initiation of antidepressants was calculated using McNemar's test for matched pairs. Logistic regression analysis was used to assess the effects of gastric irritants and demographic factors upon SGA use. A case-control analysis was also performed to compare SGA usage among users of salbutamol as compared to users of antidepressants.

Results:

A total 5588 members were identified from our database, representing 8722 discrete exposures to antidepressants. SGA were prescribed in approximately 20% of antidepressant users. NSAIDs were the gastric irritant medications most commonly used (43% of antidepressant users). Preliminary analysis of the results suggests that SGA are not more likely to be prescribed following initiation of an antidepressant.

Conclusion:

The prescribing of gastric acid suppressants does not appear to increase following initiation of antidepressant therapy among non-elderly adults.

The Effects Of Medication Use On The Risk Of Accidents Among Members Of The Canadian Forces

Régis Vaillancourt, BPharm, PharmD. Janice Ma, BScPhm, PharmD. Deputy Chief of Staff Medical Policy, Pharmacy Policy and Standards, Canadian Forces Health Services. Ottawa, ON; J.Sampalis, MSc, PhD; JSS Medical Research Inc., Montréal, QC; C. Ineke Neutel, PhD. Sisters of Charity (Ottawa) Health Services, Ottawa, ON.

Rationale:

Most epidemiological studies which evaluate the impact of medications on risk of accidents have focused on elderly patients and benzodiazepines. This study has been performed to assess accident risk and medication use among a population of younger adults.

Objectives:

To determine if specific classes of medication are more likely to be consumed during the two weeks prior to an accident in a general adult population.

Methods:

A database was constructed to link information about accidents and medication use among persons employed by the Canadian Forces between January 1999 and December 2001. The case period was defined as the two weeks prior to accident occurrence. In the first analysis, an accident-free historical control period was defined for each subject and medication use compared between case and control periods using incidence risk ratio. A second analysis was then performed using an accident-free control matched for age, sex, occupation, and employment date, to yield an odds ratio for each class of medication.

Results:

Significantly increased odds ratios were detected for 12 different medication classes. Clinically significant odds ratios were observed for antispasmodics and anticholinergics (OR 5.598), estrogens (OR 2.777), and digestives (OR 3.256). Odds ratios for the remaining drug categories ranged from 1.254 (for laxatives) to 1.795 (for beta-blockers).

Conclusion:

This analysis identified several medications which were more likely to have been taken in the two weeks prior to an accident. Further studies should be undertaken to confirm the magnitude of risk associated with these drugs.

Stability Of Clozapine In Oral Suspension Vehicles At Room Temperature

Scott E. Walker, MScPhm, Diane Baker, BScPhm, Shirley Law, Dip Pharm Tech. Departments of Pharmacy, Centre for Addiction and Mental Health, and Sunnybrook & Women's College Health Sciences Centre, University of Toronto.

Rationale:

There is no commercial oral clozapine suspension available. Clozapine suspension prepared using Guy's Syrup is time consuming and difficult to re-suspend. This product has been given a shelf-life of 14 days. The ability to use a commercially available suspending agent and a longer expiry date will result in a better product ensuring that the patient receives the correct dose and also create significant savings in both preparation time and reduced wasted from outdated product.

Objective:

The objective of this study was to evaluate the stability of a 20 mg/mL clozapine suspension in 6 different suspending vehicles; Ora-Sweet®, Ora Plus®; 50% Ora-Sweet – 50% Ora Plus; Hospital for Sick Children's Suspending Vehicle; Guy's Syrup and Simple Syrup.

Methods:

A reverse phase stability-indicating liquid chromatographic method with UV detection at 232 nm was validated prior to study. Validation demonstrated that clozapine could be quantified accurately and reproducibly. On study-day zero, 100 mL of a 20-mg/mL clozapine suspension was prepared in each of 6 different suspending vehicles. Each suspension was separated into 30-mL aliquots and stored in 60 mL LDPE amber plastic containers. All solutions were stored at room temperature unprotected from light during the study. On study days 0, 3, 6, 14, 28, and 63 the concentration of clozapine was determined, and physical inspection completed.

Results:

During the study period, concentrations observed in all study samples retained more than 95.0% of their initial concentration. Inspection of chromatograms during the stability study failed to reveal any degradation products that were observed during assay validation.

Conclusion:

We conclude that 20 mg/mL suspensions of clozepine stored in LDPE amber plastic containers at 24oC retains more than 90% per cent of the initial clozapine concentration during 63-days of storage, regardless of suspending vehicle: Ora-Sweet®, Ora Plus®; 50% Ora-Sweet – 50% Ora Plus; Hospital for Sick Children's Suspending Vehicle; Guy's Syrup or Simple Syrup.

Stability Of Sulfasalazine Oral Suspensions In Ora-Sweet And Ora-Plus Vehicle At 40c And 230c In Three Different Containers.

Karen Lingertat-Walsh, B.Sc.Phm, Scott E. Walker, MScPhm, Shirley Law, Dip Pharm Tech. Marissa Abesamis, Pharmacy Technician. Departments of Pharmacy, Hospital for Sick Children, and Sunnybrook & Women's College Health Sciences Centre, University of Toronto.

Rationale:

Sulfasalazine is used to treat ulcerative colitis. Since no commercial oral liquid exists, we required a liquid formulation for pediatrics. The required recipe had to be acceptable to patients, easily compounded, stable (for at least 60 days) and of a concentrated strength (to avoid administration of large volumes).

Objective:

The objective of this study was to evaluate the stability of a 100 mg/mL sulfasalazine suspension in 50% Ora-Sweet – 50% Ora Plus suspending vehicles in 3 different containers; glass, Poly Ethylene Terepthalate (PET) and Low Density Polyethylene (LDPE).

Methods:

A reverse phase stability-indicating liquid chromatographic method with UV detection at 232 nm was validated prior to study. Validation demonstrated that sulfasalazine could be quantified accurately and reproducibly. On study-day zero, for each of 3 containers, we compounded three separate 100ml batches. Each 100ml was then separated into 2x50ml aliquots; one stored at RT and the other under refrigeration. A total of 6x50ml sample bottles were prepared for each container type, (18x50ml in all made from 9x100ml individual batches). Each 100 mL batch of a 100-mg/mL sulfasalazine suspension was prepared using 50% Ora-Sweet – 50% Ora Plus as the suspending vehicle. 50 mL aliquots were separated into either 100 mL amber glass bottles, 100 mL amber PET bottles or 100 mL amber LDPE bottles. Half of the bottles were stored at room temperature unprotected from light and the other half were stored in the refrigerator at 4C. On study days 0, 2, 7, 14, 21, 28, 42 and 91 the concentration of sulfasalazine was determined, and physical inspection completed.

Results:

During the study period, concentrations observed in all study samples at both temperatures retained more than 93.0% of their initial concentration. Inspection of chromatograms during the stability study failed to reveal any degradation products that were observed during assay validation.

Conclusion:

We conclude that 100 mg/mL suspensions of sulfasalazine stored in amber glass, amber PET or amber LDPE containers at 24oC or 4oC retains more than 90% per cent of the initial sulfasalazine concentration during 91-days of storage.

Simulation Of Y-Site Compatibility Of Irinotecan And Leucovorin At Room Temperature (230c) In 5% Dextrose In Water In Different Containers

Scott E. Walker2,3 MScPhm, Shirley Law2, Dip Pharm Tech, Anitasha Puodziunas1 BScPhm. (1) Pfizer Canada, (2)Pharmacy, Sunnybrook and Women's Health Science Centre and (3)University of Toronto, Toronto.

Objective

The objective of this study is to evaluate the compatibility of irinotecan (Camptosar") and racemic leucovorin (Leucovorin USP, Novopharm) when diluted in 5% dextrose in water and stored at 230C, unprotected from light, simulating Y-site drug administration. Six combinations of irinotecan and leucovorin (0.53 / 0.94; 0.53 / 0.74; 0.56 / 0.66; 0.56 / 0.27; 0.30 / 3.60; 0.30 / 0.68 mg/mL, respectively) were chosen to replicate concentrations encountered in practice.

Methods

A total of 3 samples of each of the six different concentration combinations were prepared for each of 3 container types (PVC, Excel and glass) and stored at room temperature (23oC). The concentration of irinotecan and leucovorin in each of the three samples was determined by a stability-indicating validated liquid chromatographic analysis at time zero (immediately following mixing) and at 30 minutes, 1 hour and 24 hours. Prior to mixing and immediately following mixing each solution was physically inspected and the pH of one solution was determined.

Results

At room temperature over a 24-hour period, solutions of irinotecan (0.30 to 0.56 mg/mL) and leucovorin (0.27 to 3.60 mg/mL) were observed to be physically compatible. No precipitate was visible in any solution, no colour changes occurred and no gas was produced on mixing. There was no practical difference between solutions stored in each of the three container types (PVC, Excel and glass – simulating tubing differences).

In the study sample containing 0.30 mg/mL irinotecan and 3.60 mg/mL leucovorin, the irinotecan degraded to 77% of initial over the first 24 hours. The pH of this solution was 6.5. Irinotecan was observed to degrade faster as the pH increased beyond 6 and at a pH of 8 irinotecan will degrade at about 0.5% per minute.

Conclusions

Irinotecan and leucovorin are physically compatible. Most solutions were also chemically stable over the 24-hour period except the sample containing 0.30 mg/mL irinotecan and 3.60 mg/mL leucovorin. In this solution 95% of the irinotecan remained after 30 minutes. Since standard intravenous tubing 32 inches long with a normal internal diameter will contain less than 2 mL of solution, even at the lowest flow rate, the period of contact between irinotecan and leucovorin solutions will be less 3 minutes. Therefore we conclude that irinotecan and leucovorin solutions are physically compatible and chemically stable for a sufficient period of time to allow Y-site infusion.

Which Criteria Should Be Emphasized When Implementing Surgical Antimicrobial Prophylaxis Guidelines?

Thiriond D.J.G., M.Sc., Pharm.D., BCPS[1,2], Frenette A.J., B.Pharm., M.Sc.[1,2], Précourt A., B.Pharm., M.Sc.[1,2], Fillion A., B.Pharm., M.Sc.[2], Laflamme P., MD.2, Blais L.[1,2] Ph.D.

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Therapeutic guidelines for surgical antimicrobial prophylaxis (SAP) have been published. A retrospective chart review was performed to evaluate current practice according to guidelines in view of further intervention for improving clinical outcomes.

Patients undergoing general, orthopaedic, thoracic, and cardiac surgery were selected randomly over a 4 month period at a level III trauma centre. Five criteria for assessment were developed by hospital committee involving surgeons, gynaecologists, anaesthetists, microbiologists and pharmacists. Conformity of SAP was assessed for indication, choice, dosing, interval, and duration. Surgical site infection rates was assessed. Documentation of SAP in terms of dosing, timing, and duration was assessed.

The study included 443 patients. Conformity was assessed using descriptive statistics for identified criteria of indication 94% (418/443), choice 78% (181/233), dosing 95% (173/182), interval 89% (166/187), and duration 34% (78/232). Overall conformity to criteria was 52% (231/443). Surgical site infection rates were assessed for general 4.1% (9/217), orthopaedic 3.5% (6/171), thoracic 3.2% (1/31), and cardiac 4.8% (4/84) surgery. Documentation of SAP was present >80% of time for all criteria except for timing of administration (< 30%).

SAP use concurred with current guidelines. When implementing guidelines, emphasis should be placed on number of doses, administration of a second dose of antimicrobials in prolonged surgery, and documentation of SAP. Impact of guidelines on surgical site infection rates and super infections is needed.

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Peter Loewen B.Sc.(Pharm.), Pharm.D.

Peter Loewen earned his Bachelor of Science in Pharmacy degree at the University of British Columbia in 1993, completed a hospital pharmacy residency at BC's Children's Hospital in 1994, and earned his Doctor of Pharmacy degree from the University of British Columbia in 1996.

Since that time, Dr. Loewen has assumed multiple professional roles. He has been a Pharmacotherapeutic Specialist at Vancouver Hospital & Health Sciences Center where he has provided pharmaceutical care in general medicine for the past seven years and has served as Clinical Coordinator for UBC Hospital since 2001. During this time he has led the transition to a patient-centered pharmaceutical care practice mode for the pharmacists there. Peter has also been Co-coordinator of the Vancouver Hospital pharmacy residency program since 2001.

As a clinical assistant professor at UBC, Dr. Loewen has coordinated the advanced pharmacotherapeutics course in the UBC Doctor of Pharmacy program which has involved transforming the teaching and learning style to a "developmental perspective" with a case-based focus. In addition to his significant teaching responsibilities in the graduate and undergraduate pharmacy programs at UBC, Dr. Loewen has supervised more than 35 Doctor of Pharmacy students and numerous residents in the internal medicine practice setting.

Dr. Loewen has been an investigator on a wide variety of research projects ranging from randomized clinical trials to meta-analyses and pharmacoeconomic analyses. He has published more than 20 articles in peer reviewed journals, has authored a book chapter and several educational modules, and is a reviewer for a number of pharmacy journals. He has been an invited speaker at over 45 medical, nursing and pharmacy conferences.

Peter is a founder and Publishing Editor of the Journal of Informed Pharmacotherapy. Launched in 2000, the JIP is the world's first peer-reviewed online journal devoted to drug therapy.

Peter was Programs Coordinator for the CSHP BC Branch in 1997 and served as President of the BC Branch in 1999. He developed the first CSHP website for the BC Branch as well as an "E-nouncement" service which became the model for other branches and CSHP National in communicating with their members.

Dr. Loewen is in his third year as Chair of the University of British Columbia's Clinical Research Ethics Board where he is the first non-physician to fulfill this role. He is also Chair of UBC's Research Ethics Policy Advisory Board, and has served on various other hospital, university, and professional committees.

Dr. Loewen's research and clinical interests have so far included stroke, antithrombotic therapies, postoperative nausea and vomiting, migraine, gastrointestinal bleeding and its relation to nonsteroidal anti-inflammatory drugs, evidence-based patient choice, meta-analysis techniques, research ethics, application of information technologies in clinical practice, and clinical information management strategies for pharmacists. He has received several awards for his research activities.

In his real life, Peter enjoys golf, snowboarding, cycling, boating, football, and his family.

C. Brian Tuttle B.Sc.(Pharm.), M.Sc.Phm.

Brian Tuttle graduated from Dalhousie University in Halifax with his Bachelor of Science in Pharmacy in 1968, completed a CSHP-accredited Residency in Hospital Pharmacy at the Toronto General Hospital in 1969 and earned his Master of Science in Pharmacy from the University of Toronto in 1971. He returned to Halifax in 1971 and was appointed Assistant Professor, College of Pharmacy, Dalhousie University with teaching responsibility for classes in hospital pharmacy, drug information services and sterile preparations. During this period, he served as Faculty Liaison for the first Maritime hospital pharmacy residency program, instituted at the Camp Hill Hospital in 1972.

In 1975, Brian joined the pharmacy staff of Camp Hill Hospital as Director of Drug Information Services and, over the next 26 years, served with the pharmacy management team as it responded to the many challenges of organizational and practice change taking place in healthcare delivery. During this period, the Hospital experienced a number of organizational changes and mergers to the extent that, by 2001, health care institutions in the region had begun the process of amalgamating as a 'health authority,' one of nine in Nova Scotia. Following a brief period as Acting Director, Brian was appointed in 2001 to his current position as Director, Pharmacy for the Capital District Health Authority.

During his career, Brian has developed a number of programs and services in the field of drug information, drug utilization review and pharmacoeconomic evaluation of new drugs. At the foundation of his work, a comprehensive, hospital-based drug information service has for many years served healthcare audiences within the hospital, in the region and throughout the Maritimes. From this environment, new programs and pharmacists with specialized skills have evolved focusing on drug formulary management, drug use management, therapeutics publications, pharmacoeconomic evaluation of high-cost drugs and regional adverse drug reaction reporting.

Brian has supervised or co-supervised hospital pharmacy residents since 1972, served as editor of hospital, pharmacy association and interdisciplinary drug and therapeutic bulletins, served on hospital and government drugs and therapeutics committees, published articles in local, regional and national journals and delivered drug and therapeutics presentations to groups and organizations across the region. He is a Past President of CSHP and has participated on a number of committees and task forces at both the Branch and national level, most recently, the Governance Task Force. He has served on the panel of appraisers for the Canadian Journal of Hospital Pharmacy, the Canadian Pharmaceutical Journal and the CSHP Awards Program and is currently President of the Nova Scotia Association of Hospital Pharmacist Managers.

CSHP would like to recognize the generous contributions of the following speakers.

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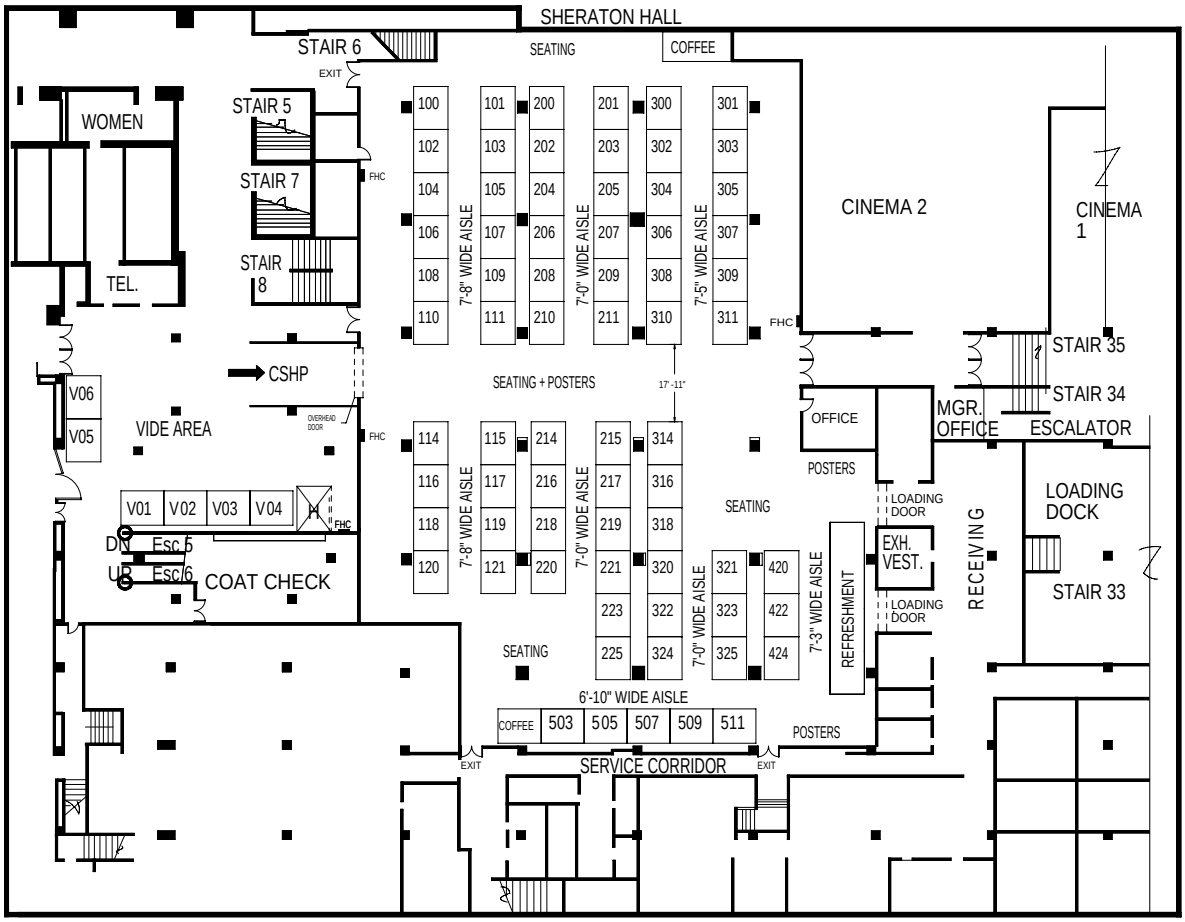

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PAAB

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The Ontario Branch CSHP invites you to its Professional Practice Conference Curling Bonspiel on Saturday, January 31, 2004

High Park Curling Club, Toronto, Ontario • 5:00 pm

Come out and meet friends and colleagues from across the country and have some **FUN!**

Register **EARLY** as this event is limited to **50 people**.

No experience is required.

Bus transportation will be provided from the hotel, departing at 4:00 pm.

$50 per person • Early bird: **$40** if you register before Dec. 19, 2003.

Includes dinner, ice rental, equipment and prizes!

Name: _____

Hospital: _____

Tel.: _____ Fax: _____

Email: _____

Curling Experience: ❑ Yes ❑ No

Are you willing to skip a team: ❑ Yes ❑ No

Would you be interested in a 15 minute curling clinic before the game? ❑ Yes ❑ No

Please fax your registration to Janet Lett at CSHP, fax no. (613) 736-5660. If you have any questions, please contact Janet Lett at (613) 736-9733, ext. 230.

LIPITOR
atorvastatin calcium
tablets

EFFICACY TO REACH TARGETS

LIPITOR
(atorvastatin calcium)
10 mg, 20 mg, 40 mg and 80 mg tablets
THERAPEUTIC CLASSIFICATION: Lipid Metabolism Regulator

ACTIONS AND CLINICAL PHARMACOLOGY

LIPITOR (atorvastatin calcium) is a synthetic lipid-lowering agent. It is a selective, competitive inhibitor of 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase. This enzyme catalyzes the conversion of HMG-CoA to mevalonate, which is an early and rate-limiting step in the biosynthesis of cholesterol.

LIPITOR lowers plasma cholesterol and lipoprotein levels by inhibiting HMG-CoA reductase and cholesterol synthesis in the liver and by increasing the number of hepatic Low Density Lipoprotein (LDL) receptors on the cell-surface for enhanced uptake and catabolism of Low Density Lipoprotein (LDL).

LIPITOR reduces LDL-Cholesterol (LDL-C) and the number of LDL particles. LIPITOR also reduces Very Low Density Lipoprotein-Cholesterol (VLDL-C), serum triglycerides (TG) and Intermediate Density Lipoproteins (IDL), as well as the number of apolipoprotein B (apo B)-containing particles, but increases High Density Lipoprotein-Cholesterol (HDL-C). Elevated serum cholesterol due to elevated LDL-C is a major risk factor for the development of cardiovascular disease. Low serum concentration of HDL-C is also an independent risk factor. Elevated plasma TG is also a risk factor for cardiovascular disease, particularly if due to increased IDL, or associated with decreased HDL-C or increased LDL-C.

Atorvastatin is rapidly absorbed after oral administration; maximum plasma concentrations occur within 1 to 2 hours. Atorvastatin tablets are 95% to 99% bioavailable compared to solutions.

Mean distribution of atorvastatin is approximately 381 litres. Atorvastatin is ≥98% bound to plasma proteins. Atorvastatin is extensively metabolized by cytochrome P-450 3A4 to ortho- and para-hydroxylated derivatives and to various beta-oxidation products. Approximately 70% of circulating inhibitory activity for HMG-CoA reductase is attributed to active metabolites.

Atorvastatin and its metabolites are eliminated by biliary excretion. Less than 2% of a dose of atorvastatin is recovered in urine following oral administration. Mean plasma elimination half-life of atorvastatin in humans is approximately 14 hours, but the half-life of inhibitory activity for HMG-CoA reductase is 20 to 30 hours due to the contribution of longer-lived active metabolites.

INDICATIONS AND CLINICAL USE

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 hypercholesterolemic and dyslipidemic conditions, when response to diet and other nonpharmacological measures alone has been inadequate, including:

- Primary hypercholesterolemia (Type IIa);
- Combined (mixed) hypertriglyceridemia (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.

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). 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 IIa/ dyslipidemic patients. These changes in HDL-C with HMG CoA reductase inhibitors should be considered as modest when compared to those observed in LDL-C and do not play a primary role in the lowering of LDL-C/HDL-C and total-C/HDL-C ratios.

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 (25-66%) 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 (40-51%), 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 15% in receptor negative patients (see PHARMACOLOGY, Clinical Studies).

For more details on efficacy results by pre-defined classification and pooled data by Fredrickson types, see PHARMACOLOGY, Clinical Studies.

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)]

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 prothrombotic 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 SELECTED BIBLIOGRAPHY in product monograph).

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.

The Atorvastatin Versus Revascularization Treatments (AVERT) study examined the effect of intensive lipid-lowering in patients with stable coronary artery disease and LDL-C of least 3.0 mmol/L in patients referred for percutaneous transluminal coronary angioplasty (PTCA). Patients were randomized for 18 months to LIPITOR 80 mg daily or to PTCA with usual medical care which could include lipid metabolism regulators. The results of the AVERT study should be considered as exploratory since several limitations may affect its design and conduct. In the medical-treated group with LIPITOR there was a trend for a reduced incidence of ischemic events and a delayed time to first ischemic event. The results also suggest that intensive treatment to target LDL-C levels with LIPITOR is **additive and complementary** to angioplasty and would benefit patients referred for this procedure (see SELECTED BIBLIOGRAPHY in product monograph).

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 lactation (see PRECAUTIONS).

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 and PRECAUTIONS, Drug Interactions and Cytochrome P-450-mediated Interactions).

Hepatic Effects

In clinical trials, persistent increases in serum transaminases greater than three 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 greater than 3 times the upper limit of normal and are persistent, the dosage should be reduced or the drug discontinued.

LIPITOR 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.

Muscle Effects

Myopathy, defined as muscle aching or muscle weakness in conjunction with increases in creatinine phosphokinase (CPK) values to greater than ten times the upper limit of normal, should be considered in any patient with diffuse myalgia, muscle tenderness or weakness, and/or marked elevation of CPK. Patients should be advised to report promptly unexplained muscle pain, tenderness or weakness, particularly if accompanied by malaise or fever. 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).

Rhabdomyolysis has been reported in very rare cases with LIPITOR (see PRECAUTIONS, Drug Interactions).

Rhabdomyolysis with renal dysfunction secondary to myoglobinuria has also been reported with HMG-CoA reductase inhibitors. LIPITOR therapy should be temporarily withheld or discontinued in any patient with an acute serious condition suggestive of a myopathy or having a risk factor predisposing to the development of renal failure secondary to rhabdomyolysis (such as severe acute infection, hypotension, major surgery, trauma, severe metabolic, endocrine and electrolyte disorders, and uncontrolled seizures).

PRECAUTIONS

General

The effects of atorvastatin-induced changes in lipoprotein levels, including reduction of serum cholesterol on cardiovascular morbidity or mortality or total mortality have not been established.

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 (see SELECTED BIBLIOGRAPHY in product monograph).

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 (see SELECTED BIBLIOGRAPHY in product monograph).

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).

Atherosclerosis is a chronic process and discontinuation of lipid-lowering drugs during pregnancy should have little impact on the outcome of long-term therapy of primary hypercholesterolemia. Cholesterol and other products of cholesterol biosynthesis are essential components for fetal development (including synthesis of steroids and cell membranes). Since HMG-CoA reductase inhibitors decrease cholesterol synthesis and possibly the synthesis of other biologically active substances derived from cholesterol, they may cause harm to the fetus when administered to pregnant women.

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.

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

Treatment experience in a pediatric population is limited to doses of LIPITOR up to 80 mg/day for 1 year in 6 patients with homozygous familial hypercholesterolemia. No clinical or biochemical abnormalities were reported in these patients.

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 (see PHARMACOLOGY, Human Pharmacokinetics; SELECTED BIBLIOGRAPHY in product monograph).

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 diseases, the lowest dose (10 mg/day) of LIPITOR should be used in these patients. Similar precautions apply in patients with severe renal insufficiency (creatinine clearance <30 mL/min (>0.5 mL/sec)); the lowest dosage should be used and implemented cautiously (see WARNINGS, Muscle Effects; PRECAUTIONS, 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

1. Friedewald WT, *et al. Clin Chem* 1972;18(6):499-502.

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 also Geriatric Use; Renal Insufficiency; Patients with Severe Hypercholesterolemia).

Concomitant Therapy with Other Lipid Metabolism Regulators: Combined drug therapy should be approached with caution as information from controlled studies is limited.

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 that with 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 the triglycerides than LIPITOR monotherapy in both types of hypercholesterolemic patients (see PHARMACOLOGY, Clinical Studies).

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 other drugs in this class, including atorvastatin, is increased with concurrent administration (see WARNINGS, Muscle Effects and SELECTED BIBLIOGRAPHY in product monograph).

Coumarin Anticoagulants: LIPITOR had no clinically significant effect on prothrombin time when administered to patients receiving chronic warfarin therapy (see SELECTED BIBLIOGRAPHY in product monograph).

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 (see Human Pharmacokinetics). 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 (see Human Pharmacokinetics).

(quinapril): In a crossover trial, 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) (see Human Pharmacokinetics).

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 to date 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 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 (see SELECTED BIBLIOGRAPHY in product monograph). Caution should thus be exercised with concomitant use of these agents (see WARNINGS, Pharmacokinetic Interactions, Muscle Effects; PRECAUTIONS, Renal Insufficiency and Endocrine Function; DOSAGE AND ADMINISTRATION; SELECTED BIBLIOGRAPHY in product monograph).

In healthy subjects, coadministration of maximum doses of both 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. preexisting 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 system 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 approximately 40% and 80%, respectively (see WARNINGS, Muscle Effects; Human Pharmacokinetics).

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, Drug Interactions; DOSAGE AND ADMINISTRATION).**

Drug/Laboratory Test Interactions

LIPITOR may elevate serum transaminase and creatinine phosphokinase 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 are shown in Table 1 below.

TABLE 1. Associated Adverse Events Reported in ≥1% of Patients in Placebo-Controlled Clinical Trials

	Placebo % (n=270)	LIPITOR % (n=1222)
GASTROINTESTINAL		
Constipation	1	†
Diarrhea	1	†
Dyspepsia	2	†
Flatulence	2	†
Nausea	0	†
NERVOUS SYSTEM		
Headache	2	†
MISCELLANEOUS		
Pain	<1	†
Myalgia	1	†
Asthenia	<1	†

The following additional adverse events were reported in clinical trials; not all events listed below 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.

Post-marketing experience: Very rare reports: severe myopathy with or without rhabdomyolysis (see WARNINGS, Muscle Effects; PRECAUTIONS, Renal Insufficiency and Drug Interactions), isolated reports: thrombocytopenia, arthralgia and allergic reactions including urticaria, angioneurotic edema, anaphylaxis and bullous rashes (including erythema multiforme, Stevens-Johnson syndrome and toxic epidermal necrolysis). These may have no causal relationship to atorvastatin.

Ophthalmologic observations: see PRECAUTIONS.

Laboratory Tests: Increases in serum transaminase levels have been noted in clinical trials (see WARNINGS).

SYMPTOMS AND TREATMENT OF OVERDOSAGE

There is no specific treatment for atorvastatin overdosage. Should an overdose occur, the patient should be treated symptomatically and supportive measures instituted as required. Due to extensive drug binding to plasma proteins, hemodialysis is not expected to significantly enhance atorvastatin clearance.

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.

Primary Hypercholesterolemia and Combined (Mixed) Hyperlipidemia, including Familial Combined Hyperlipidemia: The recommended dose of LIPITOR is 10 mg once a day. The majority of patients achieve and maintain target cholesterol levels with LIPITOR 10 mg/day. 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. Doses can be given at any time of the day, with or without food, and should preferably be given in the evening. Doses should be individualized according to baseline LDL-C and/or TG levels, the desired LDL-C and/or TG target (see the Detection and Management of Hypercholesterolemia, Working Group on Hypercholesterolemia and other Dyslipidemias [Canada] and/or the US National Cholesterol Education Program [NCEP Adult Treatment Panel III]), the goal of therapy and the patient's response. Adjustments of dosage, if necessary, should be made at intervals of 4 weeks or more. The recommended dose range for most patients is 10 to 40 mg/day. The maximum dose is 80 mg/day, which may be required in a minority of patients (see section below).

Lipid levels should be monitored periodically and, if necessary, the dose of LIPITOR adjusted based on target lipid levels recommended by guidelines.

The following reductions in total cholesterol and LDL-C levels have been observed in 2 dose-response studies, and may serve as a guide to treatment of patients with mild to moderate hypercholesterolemia.

TABLE 2. Dose-Response in Patients With Mild to Moderate Hypercholesterolemia
(Mean Percent Change from Baseline)

Lipid Parameter	LIPITOR Dose (mg/day)			
	10 (N=22)	20 (N=20)	40 (N=21)	80 (N=23)
Total-C: 7.1 mmol/L[a] (273 mg/dL)[b]	-29	-33	-37	-45
LDL-C: 4.9 mmol/L[a] (190 mg/dL)[b]	-39	-43	-50	-60

a. Results are pooled from 2 dose-response studies.
b. Mean baseline values.

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, Drug Interactions).

Concomitant Therapy

See PRECAUTIONS, Drug Interactions.

Dosage in Patients With Renal Insufficiency

See PRECAUTIONS.

PHARMACEUTICAL INFORMATION

Drug Substance

Proper Name: Atorvastatin calcium

Chemical Name: [R-(R*,R*)]-2-(4-fluorophenyl)-β, δ-dihydroxy-5-(1-methylethyl)-3-phenyl-4-[(phenylamino) carbonyl]-1H-pyrrole-1-heptanoic acid, calcium salt (2:1) trihydrate

Empirical Formula: $(C_{33}H_{34}FN_2O_5)_2Ca \cdot 3H_2O$

Molecular Weight: 1209.42

Structural Formula:

Description: Atorvastatin calcium is a white to off-white crystalline powder that is practically insoluble in aqueous solutions of pH 4 and below. Atorvastatin calcium is very slightly soluble in distilled water, pH 7.4 phosphate buffer and acetonitrile, slightly soluble in ethanol, and freely soluble in methanol.

Tablet Composition:

Each tablet contains either 10 mg, 20 mg, 40 mg or 80 mg atorvastatin as the active ingredient. Each tablet also contains the following non-medicinal ingredients: calcium carbonate, candelilla wax, croscarmellose sodium, hydroxypropyl cellulose, lactose monohydrate, magnesium stearate, microcrystalline cellulose, hydroxypropyl methylcellulose, polyethylene glycol, talc, titanium dioxide, polysorbate 80 and simethicone emulsion.

Stability and Storage Recommendations:

Store at controlled room temperature 15 to 30°C.

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.

10 mg: White, elliptical, film-coated tablet, coded "10" on one side and "PD 155" on the other. Available in bottles of 90 tablets.

20 mg: White, elliptical, film-coated tablet, coded "20" on one side and "PD 156" on the other. Available in bottles of 90 tablets.

40 mg: White, elliptical, film-coated tablet, coded "40" on one side and "PD 157" on the other. Available in bottles of 90 tablets.

80 mg: White, elliptical, film-coated tablet, coded "80" on one side and "PD 158" on the other. Blisters of 30 tablets (3 strips x 10).

References:

1. LIPITOR (atorvastatin calcium) Product Monograph, Pfizer Canada Inc., February 2002. **2.** IMS Global Services; March 1997 – September 2002. **3.** Pitt B, *et al.* Aggressive lipid-lowering therapy compared with angioplasty in stable coronary artery disease. *N Engl J Med* 1999;341:70-76. **4.** Data on File, Pfizer Canada Inc. **5.** Simon Day. Dictionary for Clinical Trials, 1999. John Wiley & Sons Ltd. 137-38.

For a copy of the Product Monograph or full Prescribing Information, please contact:

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