



CANNT JOURNAL JOURNAL ACITN

Volume 22, Issue 4

October–December 2012

IN THIS ISSUE:

- 18** Blood pressure knowledge in hypertensive hemodialysis patients
By Zorica Kauric-Klein, RN, APRN-BC, ANCC, PhD
- 26** The availability of exercise rehabilitation programs in hemodialysis centres in Ontario
By Sunny Ma, MScPT, Jonathan Lui, MScPT, Dina Brooks, BScPT, PhD, and Trisha L. Parsons, BScPT, PT, PhD
- 33** CONTINUING EDUCATION SERIES
**New agent to treat elevated phosphate levels:
Magnesium carbonate/Calcium carbonate tablets**
By Caitlin Meyer, Karen Cameron, BScPhm, ACPR, CGP, and Marisa Battistella, BScPhm, PharmD, ACPR



formula[®] *therapy*

Your partners in renal care.



2900 Argentia Road, Unit 10
Mississauga, ON L5N 7X9
Tel: 1.866.443.8567
Fax: 1.866.443.9567
www.bhcmmedical.ca

CANNT JOURNAL JOURNAL ACITN



C O N T E N T S

Letter from the Editors: Janet Baker & Alison Thomas	4	10	Nephrology certification update
Mot des rédactrices en chef: Janet Baker et Alison Thomas	5	18	Blood pressure knowledge in hypertensive hemodialysis patients <i>By Zorica Kauric-Klein, RN, APRN-BC, ANCC, PhD</i>
Message from the President	6	26	The availability of exercise rehabilitation programs in hemodialysis centres in Ontario <i>By Sunny Ma, MScPT, Jonathan Lui, MScPT, Dina Brooks, BScPT, PhD, and Trisha L. Parsons, BScPT, PT, PhD</i>
Mot de la présidente	7	33	CONTINUING EDUCATION SERIES New agent to treat elevated phosphate levels: Magnesium carbonate/Calcium carbonate tablets <i>By Caitlin Meyer, Karen Cameron, BScPhm, ACPR, CGP, and Marisa Battistella, BScPhm, PharmD, ACPR</i>
CANNT contact information	7	38	PRACTICE CORNER
CANNT 2013 Call for abstracts	8		
Your board in action	12		
Notice board	13		
Votre ca en action	14		
Guidelines for authors	41		
Lignes directrices à l'intention des auteurs	42		



The CANNT Journal is
printed on recycled paper.

The CANNT Journal is the official publication of the Canadian Association of Nephrology Nurses and Technologists, P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0, telephone: (519) 652-0364, fax: (519) 652-5015, email: cannt@cannt.ca. Published quarterly, the journal is received by all members of CANNT. Subscriptions are: Canada \$50.00 (plus HST), US. \$60.00, Outside N. America \$85.00. Back issues, when available, are \$7.50 (+HST) per issue and are available from the editor. Opinions expressed by writers in the CANNT Journal are not necessarily those held by the editor or CANNT. Contrasting views by our readership and membership are welcome. All letters, comments and articles are to be sent to the CANNT office, P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0.
Toll-free: 1-877-720-2819
Website: www.cannt.ca

• **Deadlines for submission to the CANNT Journal are:**
January–March—January 15, for publication March 15;
April–June—April 15, for publication June 15;
July–September—July 15, for publication September 15;
October–December—October 15, for publication December 15.
The CANNT Journal is indexed in the Cumulative Index to Nursing and Allied Health Literature (CINAHL), the International Nursing Index (INI), MEDLINE, EBSCO, ProQuest and Thomson Gale.
ISSN 1498-5136

The CANNT Journal is produced by Pappin Communications, The Victoria Centre, 84 Isabella St., Pembroke, Ontario K8A 5S5.

Co-Editors

Janet Baker, RN, BN, CNeph(C)
Toronto, Ontario
Alison Thomas, RN(EC), MN, CNeph(C)
Toronto, Ontario

Editorial Board

Marisa Battistella, BScPhm, PharmD, ACPR
Toronto, Ontario
Rejean Quesnelle, ASCT
Oakville, Ontario
Eleanor Ravenscroft, RN, PhD, CNeph(C)
Calgary, Alberta
Rosalie Starzomski, RN, PhD
Vancouver, British Columbia
Colleen Wile, RN, CNeph(C)
Halifax, Nova Scotia

Managing Editor

Heather Coughlin, Pembroke, Ontario

Layout and Design

Sherri Keller, Pembroke, Ontario

Advertising Sales

Heather Coughlin,
Pappin Communications,
84 Isabella Street, Pembroke, ON K8A 5S5
T: (613) 735-0952; F: (613) 735-7983
email: heather@pappin.com
rate card: www.pappin.com

Letter from the Editors: Janet Baker & Alison Thomas

Thank you to our 2012 reviewers!



Janet Baker



Alison Thomas

As *CANNT Journal* co-editors, we pride ourselves on the peer review process that is in place to ensure that the articles we put forward for publication are of high quality and interest to you as journal subscribers. We are very grateful to our many reviewers who gave of their time and expertise in 2012 to carry out manuscript reviews. To the following reviewers, thank you for promoting and advancing nephrology nursing practice in Canada. We couldn't do it without you!

Jill Campbell, RN, MHSc, CHE
Regional Director,
Ontario Renal Network
Program Director,
St. Michael's Hospital
Toronto, ON

Billie Hilborn, RN, BScN, MH
Hemodialysis Educator
Sunnybrook Health Sciences Centre
Toronto, ON

Ann Jones, RN(EC), MSN, CNeph(C)
Nurse Practitioner, Hemodialysis
St. Michael's Hospital
Toronto, ON

Betty Kelman, RN(EC), MEd, CNeph(C)
Nurse Practitioner, Nephrology
University Health Network
Toronto, ON

David Landry, MN RN-NP CNeph(C)
Nurse Practitioner, Nephrology
QEII Health Sciences Centre
Halifax, NS

Rick Luscombe, RN, BSN, CNeph(C)
Vascular Access Clinical Nurse Leader
Vancouver Coastal,
Providence Health Care
Vancouver, BC

Julie Nhan, RN, MN, CNeph(C)
Nurse Practitioner
Northern Alberta Renal Program
University of Alberta Hospital
Edmonton, AB

Daisy Perry, RN, BSN, CNeph(C)
Staff Nurse Home Peritoneal
Dialysis Unit
Northern Alberta Renal Program
Capital Health
Edmonton, AB

Eleanor F. Ravenscroft, CNeph(C), RN, MSN, PhD
Faculty of Nursing
University of Calgary
Calgary, AB

Dennis Smith, RN(EC), MN
Nurse Practitioner, Nephrology
London Health Sciences Centre
London, ON

Dawn Tymianski, RN(EC), MN, NP-A, CNNC(C)
Nurse Practitioner, Krembil
Neurosciences
University Health Network
Toronto, ON

Nancy Webster, RN, CNeph(C), BScN, MHScN
Program Director Nephrology,
Regional Director, MH LHIN
Halton Healthcare Services Corporation
Oakville, ON

Diane Watson, RN(EC), MSc, CNeph(C)
Nurse Practitioner, Nephrology
University Health Network
Toronto, ON

Chapeau à tous nos réviseurs en 2012!



Janet Baker



Alison Thomas

En tant que corédactrices en chef du *Journal de l'ACITN/CANNT*, nous sommes fières du processus d'évaluation par les pairs mis qui a été mis en place pour assurer que les articles que nous publions sont de grande qualité dans l'intérêt supérieur de nos abonnés. Nous sommes très reconnaissantes envers nos nombreux réviseurs qui ont si généreusement donné de leur temps et de leur expertise en 2012 pour réviser des manuscrits. À tous les réviseurs mentionnés ci-dessous, nous vous remercions de promouvoir et de faire avancer la pratique infirmière de néphrologie au Canada. Nous ne pourrions y arriver sans vous!

Jill Campbell, inf., MHSc, CHE
Directrice régionale,
Ontario Renal Network
Directrice de programme,
St. Michael's Hospital
Toronto, ON

Billie Hilborn, inf., BScInf, MH
Éducatrice en hémodialyse
Sunnybrook Health Sciences Centre
Toronto, ON

Ann Jones, inf. (PA), MSN, CNéph(C)
Infirmière-praticienne, Hémodialyse
St. Michael's Hospital
Toronto, ON

Betty Kelman, inf. (PA), MEd,
CNéph(C)
Infirmière-praticienne, Néphrologie
University Health Network
Toronto, ON

David Landry, IP, MN, CNéph(C)
Infirmier-praticien, Néphrologie
QEII Health Sciences Centre
Halifax, N.-É.

Rick Luscombe, inf., BScInf, CNéph(C)
Infirmier clinicien chef, Accès
vasculaires
*Vancouver Coastal,
Providence Health Care*
Vancouver, C.-B.

Julie Nhan, inf., MN, CNéph(C)
Infirmière-praticienne
*Northern Alberta Renal Program
University of Alberta Hospital*
Edmonton, AB

Daisy Perry, inf., BScInf, CNéph(C)
Infirmière, Unité de dialyse péritonéale
à domicile
*Northern Alberta Renal Program
Capital Health*
Edmonton, AB

Eleanor F. Ravenscroft, inf., CNéph(C),
MSN, PhD
University of Calgary
Faculté des sciences infirmières
Calgary, AB

Dennis Smith, inf. (PA), MN
Infirmier-praticien, Néphrologie
London Health Sciences Centre
London, ON

Dawn Tymianski, inf. (PA), MN,
NP-A, CNNC(C)
Infirmière-praticienne,
*Krembil Neurosciences
University Health Network*
Toronto, ON

Nancy Webster, inf., BScInf,
CNéph(C), MHScN
Directrice de programme de
néphrologie, directrice régionale,
MH LHIN
Halton Healthcare Services Corporation
Oakville, ON

Diane Watson, inf. (PA), MSc,
CNéph(C)
Infirmière-praticienne, Néphrologie
University Health Network
Toronto, ON

Le Journal ACITN

est la publication officielle de l'Association canadienne des infirmiers/infirmières et technologues en néphrologie, a/s P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0, téléphone: (519) 652-0364, télécopieur: (519) 652-5015, Courriel: cannt@cannt.ca. Publié quatre fois par année, ce journal est envoyé à tous les membres de l'Association. L'abonnement annuel est: Canada, 50 \$ (+TVH), E.-U., 60 \$, hors du Canada et E.-U., 85 \$. Les publications antérieures, lorsque disponibles, coûtent 7,50 \$ (+TVH) chacune. Les opinions émises par les auteurs dans ce journal ne sont pas nécessairement partagées par l'Association ni par le rédacteur en chef. Nous invitons les lecteurs à nous faire part de leurs opinions. Toute correspondance devra être envoyée à l'ACITN, P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0. Site web: www.cannt.ca

• Voici les échéanciers à rencontrer pour soumettre des articles/nouvelles au journal:
Janvier-mars: le 15 janvier, pour publication le 15 mars
Avril-juin: le 15 avril, pour publication le 15 juin
Juillet-septembre: le 15 juillet, pour publication le 15 septembre
Octobre-décembre: le 15 octobre, pour publication le 15 décembre
Le journal CANNT est maintenant répertorié dans le «Cumulative Index to Nursing and Allied Health Literature (CINAHL)», «International Nursing Index» (INI), «MEDLINE», «EBSCO», «ProQuest» et «Thomson Gale». ISSN 1498-5136

Le journal CANNT est préparé par Pappin Communications, The Victoria Centre, 84 rue Isabella, Pembroke, Ontario K8A 5S5.

Rédactrices en chef
Janet Baker, RN, BN, CNéph(C)
Toronto, Ontario
Alison Thomas, RN(EC), MN, CNéph(C)
Toronto, Ontario

Conseil de rédaction
Marisa Battistella, BScPhm, PharmD, ACPR
Toronto, Ontario
Rejean Quesnelle, ASCT
Oakville, Ontario
Eleanor Ravenscroft, RN, PhD, CNéph(C)
Calgary, Alberta
Rosalie Starzomski, RN, PhD
Vancouver, British Columbia
Colleen Wile, RN, CNéph(C)
Halifax, Nova Scotia

Éditeur
Heather Coughlin, *Pembroke, Ontario*

Conception et design
Sherri Keller, *Pembroke, Ontario*

Publicité
Heather Coughlin,
Pappin Communications,
84 Isabella Street, Pembroke, ON K8A 5S5
T: (613) 735-0952; F: (613) 735-7983
email: heather@pappin.com
rate card: www.pappin.com

**2012–2013 CANNT
Board of Directors
Conseil d'administration
de l'ACITN 2012–2013**

President/Président:

Colleen Wile, RN, BScN, CNeph(C)
T: 902-473-5868
F: 902-473-4168
email/courriel: colleend.wile@cdha.nshealth.ca

President-Elect/Présidente-Élue:

Roberta Prettie, RN, CNeph(C)
T: 204-482-9482
email/courriel: rmprettie@mymts.net

Past President/Présidente sortante:

Marilyn Muir RN, CNeph(C)
T: 204-787-3611
F: 204-787-7038
email/courriel: mrmuir@hsc.mb.ca

**Website Coordinator, Treasurer/
Trésorière coordonnatrice du site internet:**
Florence Holder, RN
email/courriel: fmholder@hotmail.ca

**Vice-President of Technologists/
Vice-Président des Technologues:**

Reg Quesnelle, ASCT
T: 905-845-2571 x6857
email: regq101@gmail.com

**Atlantic Region Vice-President/
Vice-Présidente de l'Atlantique:**
Carolyn Bartol, RN, BScN, CNeph(C)
T: 902-473-4944
F: 902-473-4168
email/courriel: carolyn.bartol@cdha.nshealth.ca

**Quebec Vice-President/
Vice-Présidente du Québec:**
Roch Beauchemin, RN, BSS, MSN, NNP
T: 514-934-1934 x35039
F: 514-843-2860
email/courriel: rochbeauchemin@hotmail.com

**Ontario Region Vice-President/
Vice-Présidente de l'Ontario:**
Krista Lovering
T: 705-454-3893
email/courriel: klovering@osmh.on.ca

**Western Region Vice-President/
Vice-Présidente de l'Ouest:**
Heather Dean, RN, CNeph(C)
T: 403-943-9400
email/courriel: heather.dean@albertahealthservices.ca

Journal Editors/Les rédactrices en chef:
Janet Baker, RN, BN, CNeph(C)
T: 905-845-2571 x6483
email/courriel: jbaker@haltonhealthcare.on.ca

Alison Thomas, RN(EC), MN, CNeph(C)
T: 416-864-6060 x6979; F: 416-864-5608
email/courriel: thomasal@smh.ca

Message from the President

Looking back



It's hard to believe how quickly this year has flown by. Looking back on the past year is bittersweet. I can't help but think of the fascinating people I have met, the friendships I have made, and the many emails I have returned! The end of my year as president means progress, as Colleen Wile takes over as our CANNT president... which is another reason for us to celebrate!

Being a CANNT board member has been such a rewarding experience, and becoming a CANNT member is a great way to promote and encourage professional development locally in your units. I believe everyone benefits from the many opportunities provided by CANNT. Whether you take advantage of the reduced conference rate, read the excellent articles in our peer-reviewed journal, become a unit liaison, access the technical or nursing standards, or network with one of our many partners, the benefits of membership are countless. Remember to take advantage of the awards and bursaries available... whether you are continuing your own education or want to nominate a colleague for an award of excellence—we have more than \$26,000 available, so please remember to apply. The deadline for applications is May 1 of each year. Membership is paramount to the success of our association; people really do make the organization, and I am thankful for the commitment of all our CANNT members. My goal has been to inspire all nephrology health care professionals to become CANNT members.

I have been very fortunate to serve on the CANNT board with a group of enthusiastic individuals and I have made some wonderful new friends. I would like to take this opportunity to say thank you to the out-going board members: Patty Quinan and Jocelyn Lang. I appreciate your hard work and dedication to CANNT.

I am pleased to welcome our new CANNT board members: Roberta Prettie, President-Elect, and Krista Lovering, VP Ontario.

They join our existing board members Rejean Quesnelle, VP Technology,

Heather Dean, VP Western Region, Roch Beauchemin, VP Quebec, Carolyn Bartol, VP Atlantic Region, and Florence Holder, Website Coordinator/Treasurer. Colleen Wile is our new CANNT President, and I move to the role of Past-President. This is your new 2012–2013 CANNT Board of Directors. I am pleased to continue serving with such a dedicated team. Together we work at making our association better for all our members.

We just celebrated another successful CANNT conference in Ottawa. The theme of CANNT 2012 "Environments of Excellence" was most fitting with CANNT's Vision, "to see CANNT as the keystone of excellence in nephrology nursing and technological care in Canada". I would like to congratulate co-chairs Rita Brownrigg and Gail Sprott, along with the rest of their planning committee, for a job well done.

Mark your calendars for CANNT 2013 in St. John's, Newfoundland, October 6–8, 2013. Co-chairs Anne Rowsell and Cheryl Harding and their planning committee have already started the planning process. I feel fortunate to be the CANNT board of directors' representative on this planning committee—for it promises to be another excellent scientific program and a "rally on the rock" that won't soon be forgotten!

I would personally like to thank you—our members. Without you, we wouldn't have an association. I hope that our initial meeting back in Calgary will always stay with you. I told you then that I wanted you to celebrate each other at every opportunity you could, and I hope you were able to leave Calgary in search of reasons to celebrate. Nursing is about teamwork, and we need to remember that it is okay to lean on each other, support each other, learn from each other and, most importantly, celebrate each other!

I encourage you to reflect on why you choose nephrology nursing or technology, and re-commit to being the best nephrology health care professional you can.

I thank you for allowing me to serve as your 2011–2012 president, and please remember—take care of each other out there!

**Marilyn Muir, RN, CNeph (C)
CANNT President, 2011–2012**

Rétrospective

Il est difficile de croire à quelle vitesse la dernière année s'est écoulée. Repenser à cette année est un mélange d'émotions douces-amères. Je ne peux m'empêcher de songer aux personnes fascinantes que j'ai rencontrées, aux amitiés que j'ai nouées et aux nombreux courriels que j'ai retournés! Mon mandat à la présidence touche à sa fin et je passe le flambeau à Colleen Wile qui assumera les responsabilités de présidente de l'Association des infirmières et infirmiers et des technologues de néphrologie (ACITN)... ce qui est une autre raison pour nous de célébrer!

Faire partie du Conseil d'administration (CA) de l'ACITN s'est révélé une expérience très gratifiante, et devenir membre de l'ACITN est une excellente façon de promouvoir et d'encourager le développement professionnel sur le plan local dans sa propre unité de soins. Je suis persuadée que tous nos membres tirent avantage des nombreuses occasions qu'offre l'ACITN. Que vous bénéficiiez de tarifs réduits à l'inscription de congrès, que vous lisiez d'excellents articles évalués par un comité de lecture et publiés dans le Journal de l'ACITN, que vous deveniez agent de liaison, que vous consultiez les normes des pratiques infirmière ou technique ou que vous réseautiez avec l'un de nos nombreux partenaires, les avantages liés à votre adhésion sont innombrables, sans oublier l'accessibilité à des prix et à des bourses... que vous décidiez de poursuivre vos études ou de poser la candidature d'un ou d'une collègue à un prix d'excellence. Nous disposons d'un fonds de plus de 26 000 \$, alors n'hésitez pas à poser votre candidature ou celle d'un ou d'une collègue aux différents programmes de prix et de bourses. La date limite pour le dépôt des candidatures est le 1^{er} mai. Votre adhésion est garante du succès de notre Association; les gens sont réellement au cœur de cette organisation, et je suis reconnaissante envers tous les membres de l'ACITN pour leur dévouement. Je m'étais donné pour objectif d'inspirer tous les professionnels de la santé œuvrant en néphrologie de devenir membres de l'ACITN.

J'ai eu la chance de siéger au CA de l'ACITN avec une équipe très enthousiaste et de me lier d'amitié avec des personnes merveilleuses. J'aimerais prendre le temps ici de remercier les membres sortants du CA: Patty Quinan et Jocelyn Lang. Sachez que je vous suis très reconnaissante de votre travail acharné et de votre dévouement à l'ACITN.

J'ai aussi le plaisir de vous présenter les nouveaux membres du CA: Roberta Prettie, présidente élue, et Krista Lovering, vice-présidente pour l'Ontario. Elles se joindront aux membres actuels du CA: Rejean Quesnelle, vice-président, Technologie, Heather Dean, vice-présidente pour l'Ouest canadien, Roch Beauchemin, vice-président pour le Québec, Carolyn Bartol, vice-présidente pour l'Atlantique et Florence Holder, coordonnatrice du site Web et trésorière. Colleen Wile est la nouvelle présidente de l'ACITN, et j'assume, quant à moi, le rôle de présidente sortante. Voilà donc votre nouveau CA de l'ACITN pour 2012–2013. Je suis heureuse de continuer à travailler avec une équipe aussi dévouée. Ensemble, nous travaillerons à rendre meilleure notre Association dans l'intérêt supérieur de tous les membres.

Nous venons de célébrer une autre réussite: le congrès de l'ACITN à Ottawa. Le thème, «Environnements d'excellence», cadrerait bien avec la vision de l'ACITN qui consiste «à devenir la clé de voûte de l'excellence dans les soins infirmiers et la technologie de la néphrologie au Canada». Je tiens à féliciter les coprésidentes du congrès, Rita Brownrigg et Gail Sprott, ainsi que tous les membres du comité organisateur, pour un travail bien fait.

À vos calendriers! Réservez les dates du prochain congrès de l'ACITN qui aura lieu à St John's, à Terre-Neuve-et-Labrador, du 6 au 8 octobre 2013. Les coprésidentes du congrès, Anne Rowsell et Cheryl Harding, ainsi que leur comité organisateur sont déjà à pied d'œuvre. Pour ma part, je serai la déléguée du CA de l'ACITN au comité organisateur. On vous promet un autre excellent programme scientifique et un «rallye» que vous ne serez pas prêts d'oublier!

J'aimerais personnellement vous remercier—vous, nos membres. Sans vous, cette Association n'existerait pas. J'espère que notre première rencontre à Calgary restera à jamais gravée dans votre mémoire. Je vous avais alors demandé de souligner chaque petit moment de célébrer, et j'ose espérer que vous avez quitté Calgary en quête de trouver des raisons de célébrer. La profession d'infirmière ou de technologue de néphrologie, c'est avant tout un travail d'équipe. Rappelons-nous que c'est OK de compter les uns sur les autres, de s'entraider, d'apprendre les uns des autres et, le plus important, de célébrer mutuellement nos mérites!

CANNT Representatives/ Contacts; Représentants/contacts ACITN

CNA Liaison/Liaison pour AIIC
Marilyn Muir RN, CNeph(C)
T: 204-787-3611; F: 204-787-7038
email/courriel: mrmuir@hsc.mb.ca

**Kidney Foundation of Canada, MAC
Representative/Fondation du rein—Comité
de médical consultatif**
Colleen Wile, RN, BScN, CNeph(C)
T: 902-473-5868; F: 902-473-4168
email/courriel: colleend.wile@cdha.nshealth.ca

Bursary Committee/Comité des Bourses
Colleen Wile, RN, BScN, CNeph(C)
T: 902-473-5868; F: 902-473-4168
email/courriel: colleend.wile@cdha.nshealth.ca

**CANNT Administrative Office/
Bureau National de l'ACITN**
PO Box 10, 59 Millmanor Place
Delaware, ON N0L 1E0
New phone: 519-652-6767
Same Toll Free: 877-720-2819
New fax: 519-652-5015

General email: cannt@cannt.ca

Contacts:
Sharon Lapointe,
Manager, Member Services
sharon@cannt.ca

Susan Mason
Manager, Website and Social Media
susan@cannt.ca

Heather Reid
National Administrator/Board
heather@cannt.ca

2013 Symposium: October 6–8 2013

Congrès 2013: 6–8 Octobre 2013

St. John's, Newfoundland
Heather E. Reid, ARCT, MSc
Principal Planner & Owner
Innovative Conferences & Communications
PO Box 319, 59 Millmanor Place
Delaware, ON N0L 1E0
T: 519-652-0364
F: 519-652-5015
Email: hreid@innovcc.ca
Website: www.innovcc.ca

Je vous invite à réfléchir aux raisons qui ont motivé votre choix pour la profession d'infirmière ou de technologue de néphrologie et à réitérer votre promesse d'être le meilleur professionnel de la santé en néphrologie.

Je vous remercie de m'avoir accordé la chance de remplir le rôle de présidente de l'ACITN pour 2011–2012. Et, promettez-moi de prendre bien soin de vous mutuellement!

Marilyn Muir, inf. CNéph (C)
Présidente de l'ACITN (2011–2012)



CANADIAN ASSOCIATION OF
NEPHROLOGY NURSES AND TECHNOLOGISTS
L'ASSOCIATION CANADIENNE DES
INFIRMIERES ET TECHNICIENS EN NEPHROLOGIE

www.cannt.ca

CALL FOR ABSTRACTS



Abstracts are currently being accepted for ORAL and POSTER presentations for **CANNT 2013 – “RALLY ON THE ROCK”**. This annual national meeting of the Canadian Association of Nephrology Nurses and Technologists will be held **October 6-8, 2013** in one of the oldest cities in North America, St. John's, Newfoundland. The conference venue is the Delta St. John's Hotel and Conference Centre, located in the heart of downtown. In keeping with CANNT 2013 - “Rally on the Rock” abstract submissions should demonstrate “New Found” realities in nephrology and technology - appropriate for the novice through to the advanced practice professional. Topics of interest may include: clinical research, innovative projects and solutions, ethics, case presentations and clinical reviews. All abstract submissions must be evidence-based. Please consult the list of leading edge topics for possible areas of interest.

LEADING EDGE TOPICS IN:

Modes of Dialysis	Technology	Vascular Access
Pathophysiology	Chronic Kidney Disease	Nutrition
Pediatrics	Psychosocial	Ethics
Pharmacology	Advance Directives	Professional Practice
Education	Professional Development	Research
Leadership	Infection Control	Transitional Care
Transplantation	Health Care & The Environment	Immunology

ABSTRACT SUBMISSION GUIDELINES:

Deadline: March 1, 2013

All abstracts must be submitted via e-mail (hleid@innovcc.ca) as an attachment in Word or WordPerfect

Submissions must include the following:

- Abstract Title**
 - must accurately reflect the content of the presentation
- Abstract Text**
 - should be no longer than 250 words (font: Times New Roman 12 point)
 - provide author information on a separate page
 - should be as informative as possible
 - define **all abbreviations** the first time they appear in the abstract
 - use only the **generic** names of drugs
 - **do not identify companies and/or products in the body or title of the abstract**

If research-based, should include:

- purpose of study
- methods
- results
- conclusions
- implications for nephrology care

If practice/education-based, should include:

- purpose of the project
- description
- evaluation/outcomes
- implications for nephrology practice/education

PRESENTATION INFORMATION: (provided on separate page)

- identify preferred format of presentation (ORAL or POSTER)
- full names and credentials of authors
- contact information for first author must include: full name, e-mail address, fax number, mailing address with postal code, home & work telephone numbers
- identify preferred audiovisual requirements (PC Viewer for Powerpoint or Slides)

IMPORTANT NOTES:

Only **COMPLETE** submissions received by **Friday, MARCH 1, 2013** will be considered.

All correspondence will be with the first author only.

Acceptance of abstract does not waive attendance fees (registration, transportation, accommodations).

Notification regarding selection decisions will be provided by Friday, March 29, 2013.

Should the abstract be selected for presentation, the author(s) authorize(s) the publication of the abstract submitted for publication in the CANNT Journal.

The presentation shall not make comparison to companies or products for any purposes of product marketing, nor will topics or materials used discredit companies or products.

The abstract should make full disclosure of corporate funding sources.

Abstracts not in the required format will be returned to the author for revision.

The language of abstract submission will be the language of presentation, if selected.

FORWARD ABSTRACTS TO:

MAIL: CANNT 2013 ABSTRACTS
Innovative Conferences & Communications
P.O. Box 319
59 Millmanor Place
Delaware, Ontario, Canada
N0L 1E0

E-MAIL: hleid@innovcc.ca (with file attached)

Nephrology certification update

Colleen Wile, RN, BScN, C Neph(C), Clinical Educator, Community Dialysis, Halifax, NS

It is time, once again, for all nurses to consider obtaining their CNA certification in nephrology. The CNA Certification Program is important to all of us: nurses, the nursing profession, employers and the general public. In achieving CNA certification, nurses are committing to a national standard of professional competence that demonstrates they are qualified, competent, and current in their nursing specialty/area of nursing practice. It reaffirms a comprehensive understanding of their specialty and a commitment to continuing competence. Specialty certification is a voluntary recognized credential reserved for registered nurses who meet specific nursing practice criteria, continuous learning and exam-based testing requirements. By renewing this credential every five years, the RN confirms that he/she has met predetermined standards and demonstrated competence in the nursing specialty/area of nursing practice.

There are many benefits in obtaining your certification, which include: an opportunity for career advancement/greater job opportunities, as some employers now seek certification as a preferred qualification; potential for salary differentials; formal recognition in the workplace, and some universities recognize it as a credit towards your nursing degree. Once certification is obtained it will also provide you with an opportunity to participate in exam development activities and/or act as a certification mentor to other nurses seeking certification.

As of December 2011, 1,170 nephrology nurses held a valid CNA certification in nephrology. CANNT would like to congratulate the successful candidates from 2012 who will add to this total. CANNT would also like to congratulate all those nurses who chose to recertify this past year. Maintaining certification shows the commitment that nephrology nurses have to our specialty. For those individuals who have registered to write the certification exam in 2013, best of luck to you!

It is also important to remember that CANNT has bursaries available to assist successful candidates. CANNT can provide a bursary to one member from each region to cover the cost of

successful certification or recertification (CNeph(C)). Applicants may apply for this award after writing the exam or receiving confirmation of successful recertification.

The Canadian Nurses Association (CNA) will be administering the 2013 CNA Certification Exam on April 20, 2013. The certification credential is part of a respected national certification program, which is developed by Canadian nurses for Canadian nurses. For those of you due to renew in 2013, applications for certification renewal will be accepted until December 3, 2012. New this year is the ability to renew online. It's an easy, fast and convenient way to maintain your CNA certification.

The initial CNA certification credential in Nephrology is valid for a five-year term and then is renewed every five years. Certification renewal can be obtained

through continuous learning (CL) activities or by writing the certification exam again. Most nurses choose to renew by CL. It is important to plan and record your CL activities from the start of the five-year term. CNA offers forms and guidelines to assist with tracking CL activities. These forms and guidelines can be found in the certification section of CNA's website under the **Continuous Learning Activities Guidelines and Forms** section.

Study aids

To assist with exam preparation, CNA has developed resources, which are made available to you. Eligible candidates will receive an access code to the online exam prep guide. In addition to the exam blueprint and competencies, this prep guide will also include practice questions, an answer key with rationales, and a bibliography.

Table 1: Number of valid CNA certifications by year and specialty/area, 2007–2011

Specialty area	2007	2008	2009	2010	2011
Cardiovascular	722	774	793	854	854
Community health	216	338	460	565	694
Critical care	1,166	1,190	1,191	1,185	1,234
Critical care pediatrics	104	100	113	123	119
Emergency	1,323	1,345	1,333	1,344	1,331
Enterostomal therapy	N/A	N/A	66	75	95
Gastroenterology	205	235	231	235	250
Gerontological	1,988	2,104	2,073	2,118	2,238
Hospice palliative care	1,103	1,247	1,232	1,279	1,345
Medical-surgical	N/A	N/A	N/A	200*	294
Nephrology	1,052	1,080	1,103	1,130	1,170
Neuroscience	237	258	269	291	304
Occupational health	908	888	879	828	808
Oncology	1,323	1,360	1,431	1,591	1,700
Orthopedics	125	153	169	194	191
Perinatal	642	665	719	744	763
Perioperative	1,552	1,566	1,560	1,540	1,539
Psychiatric and mental health	1,734	1,750	1,765	1,692	1,658
Rehabilitation	121	172	216	272	291
Total	14,526	15,225	15,603	16,260	16,878

Source: Canadian Nurses Association, Professional Practice and Regulation Division

N/A: Not applicable because the certification was not yet available.

* First time that certification became available.

CNA also offers a document called “Build on What You Know: A Study Group Manual for Nurses Preparing for CNA Certification Exams”. This manual includes tips for study group facilitators and participants, suggested references and other information. The manual can be found through NurseONE.ca, by going to the certification page and selecting resources. As a CNA member, you automatically benefit from NurseONE.ca, the electronic gateway that will help keep you current, credible, competent and connected to the most reliable nursing resources available.

As a CNA-certified nurse or certification candidate, you may also benefit from the following NurseONE.ca resources:

- **E-Library**—Search Canada’s most extensive e-library. It’s designed specifically for nurses and available 24/7.
- **Practice links**—Enrich your nursing knowledge with resources from around

the world on everything from clinical practice to policy. Deepen your understanding on a wide range of current topics with our knowledge features.

- **Professional development**—Advance your skills with the latest resources on continuing education, career development and continuing competence.

In addition to CNA’s resources, many nephrology programs have set up education sessions through their program’s educator to assist candidates in preparing for the exam. Also, at the annual symposium, CANNT hosts a pre-conference workshop to help nurses prepare for the nephrology certification exam. This workshop is available in both French and English. For those not able to attend the national conference, the CNeph(C) prep course PowerPoint presentation is available to CANNT members on the CANNT website.

Mentors

CNA has assembled a distinguished list of certified nurses who are willing to act as mentors for those nurses who wish for support or assistance with certification exams. A list of mentors can be found below or by following the link:

Alberta

Sheri Forbes, RN, BN, C Neph(C)
Calgary, AB
Tel: (403) 719-7845
Email: sheri.forbes@albertahealthservices.ca (work)
sheriandluke@shaw.ca (alternate)

Québec

Rachelle Brisson, inf., CNéph(C)
(Bilingual/Bilingue)
Gatineau, QC
Tel: Work (819) 966-6200 ext. 5407
Home (819) 986-9625
Email: rachellebrisson@live.ca

Nancy Filteau, RN, CNeph(C)
(Bilingual/Bilingue)
Laval, QC

Tel: Work (514) 934-1934 ext. 35098
Email: Nancy.filteau@muhc.mcgill.ca

Ontario

Anna-Marie Sutherland, RN,
CNeph(C), BScN(C)
Courtice, ON
Tel: (905) 372-6811 ext. 3016
Email: amsutherland@nhh.ca

Financial assistance for 2013 initial and renewal candidates

Financial assistance is offered through most hospitals and/or provincial licensing bodies to help with the cost of writing the exam. The Canadian Nurses Foundation also offers financial awards to two nurses in each specialty area to cover the certification fees. In addition, CANNT offers the certification/recertification bursary to assist with the cost of certification or recertification.

Applications for the Canadian Nurses Foundation award can be found at: <http://www.canadiannursesfoundation.com>

Application for the CANNT Certification/Recertification Bursary can be found at: <http://www.cannt.ca>

For more information on nephrology certification through CNA visit their website at: <http://www.nurseone.ca>

Table 2: Number of Valid CNA Certifications by Specialty/Area and Province/Territory of Registration, 2007–2011

Specialty area	AB	BC	MB	NB	NL	NS	NT	ON	PE	QC	SK	YT/NU	Total
Cardiovascular	72	131	33	55	**	69	0	401	*	41	34	0	854
Community health	88	112	48	11	94	26	10	257	*	0	36	**	694
Critical care	130	116	32	46	34	46	*	707	**	82	32	0	1,234
Critical care pediatrics	20	25	*	0	*	11	0	46	0	11	*	0	119
Emergency	99	166	56	98	53	99	18	631	14	33	59	5	1,331
Enterostomal therapy	13	9	*	*		*	0	52	*	*	*	0	95
Gastroenterology	36	39	10	8	6	**	0	122	*	11	11	0	250
Gerontology	400	644	157	70	48	123	*	685	47	36	22	*	2,238
Hospice palliative care	151	288	72	36	**	81	0	604	10	71	20	*	1,345
Medical-surgical	49	29	35	16	12	15	*	88	*	13	28	*	294
Nephrology	128	160	35	37	33	44	*	640	**	51	25	0	1,170
Neuroscience	29	29	**	30	*	23	0	122		46	15	0	304
Occupational health	92	52	23	20	38	40	0	505	*	9	25	0	808
Oncology	110	75	80	55	23	58	*	1,007	**	222	54	0	1,700
Orthopedics	56	24	7	28	*	14	*	49	*	*	6	0	191
Perinatal	50	95	35	65	17	51	11	376	14	28	15	6	763
Perioperative	226	227	84	72	74	101	**	645	17	54	27	*	1,539
Psychiatric/ mental health	39	80	12	65	82	115	5	1,199	34	22	*	*	1,658
Rehabilitation	20	36	14	11	*	16	0	175	*	7	6	0	291
Total	1,808	2,337	747	727	551	941	69	8,311	188	741	425	29	16,878

Source: Canadian Nurses Association, Professional Practice and Regulation Division

* Information suppressed to protect privacy (one to four records)

** Information suppressed to protect privacy (five or more records)

To prevent calculation of the suppressed number (*) by using other data in the table, another number (usually the next lowest number) is suppressed.

¹ Both the overall total and the total for occupational health include reciprocity candidates in occupational health nursing; however, these candidates are not shown in the distribution across jurisdictions.



Your board in action

Patty Quinan, RN, MN, CNeph(C),
CANNT Past President



The purpose of this report is to inform our CANNT members of the current and upcoming activities of the Board of Directors (BOD). The BOD is composed of nine members; president, past president, president-elect, four regional vice presidents (VP) (Western, Ontario, Quebec and Atlantic), VP technologist, and website coordinator/treasurer (combined).

Membership

We currently have 420 CANNT members. Membership is available to nurses, technologists and affiliate members. As an association, the BOD is always looking for ways to increase membership. We offer members the option of one- or two-year membership and, since 2009, our annual membership fees have not increased. We encourage you to maintain your membership, as this helps the long-term viability of the association.

As a CANNT member, you can take advantage of the numerous benefits that professional membership provides. Some of the benefits include access to our quarterly peer-reviewed *CANNT Journal*, reduced membership rates to attend the CANNT annual symposium, opportunities for collaborative networking with colleagues and peers through discussion forums and conference attendance, and an opportunity to apply for awards, bursaries and grants. Go onto the CANNT website at www.cannt.ca and under the heading *About*, you will find more information on “*Why should I become a member*”, and information on the Refined Clinical Practice Groups (RCPG), discussion forums, and CANNT awards, bursaries and grants.

On behalf of the BOD and our CANNT members, I would like to thank our generous corporate sponsors for their support of the association, the annual symposium and the awards, bursaries and grants. Your support is greatly appreciated.

Finances

In order to maintain the long-term viability of the association, the administrative assistant and the BOD regularly review expenditures and discuss innovative ways to generate income and improve efficiencies. For example, our spring board meetings are now held by teleconference rather than in person and we have recently purchased Adobe Connect software, which improves efficiencies and reduces the costs associated with face-to-face meetings.

Strategic planning

The Strategic Plan was developed in 2007, which helps to guide and direct CANNT's activities. The current Strategic Plan is in effect until 2013 and will be reviewed by the BOD for the period of 2013 to 2018. Our mission is “to provide leadership and promote the best nephrology care and practice through education, research and communication”. CANNT's vision is “to be the keystone of excellence in nephrology nursing and technological care in Canada”. Our goals include increasing membership and sustaining the long-term viability of the association.

Journal

The *CANNT Journal* is a peer-reviewed publication recognized as a resource for nephrology professionals. The *CANNT Journal* is indexed in the CINAHL, MEDLINE, and OVID databases and is available to members quarterly. We encourage both first-time and more experienced authors to submit articles to the journal editors for review and publication. Information about writing an abstract can be found on the CANNT website under the heading *Education*. For more information, contact journal editors Alison Thomas at thomasal@smh.ca and Jan Baker at jbaker@haltonhealthcare.on.ca.

The winner of the 2012 CANNT

Journal Award was announced at our 2012 annual conference in Ottawa. Congratulations to Lori Harwood and Barb Wilson from London, Ontario, for their article “Moving beyond the perpetual novice: Understanding the experiences of novice hemodialysis nurses and cannulation of arteriovenous fistula.”

The article can be found on the CANNT website at www.cannt.ca.

Website

The CANNT website is updated regularly and contains valuable information and opportunities for nephrology professionals, including career opportunities, discussion forums and standards of nursing and technical practice. CANNT has Facebook and Twitter and, new this year, online evaluations are available for delegates who attended the annual symposium in Ottawa, Ontario. The online evaluation is user-friendly, and you can either print or email your certificate to verify continuing education hours once you have completed the evaluation process. To learn more about these and other exciting opportunities available to CANNT members, check out our website at www.cannt.ca.

Communications

Communication between the BOD, our members and affiliate partners is a priority of CANNT. Communication is key to maintaining a viable association. Communication to our valued members is done in many ways. For example, the administrative assistant regularly sends email blasts with current information and upcoming events to our members. Regional vice presidents' reports, president's message, discussion forum for members, Refined Clinical Practice Groups, and information about various awards, bursaries and grants can be found on the website at www.cannt.ca. To contact a member of the BOD, go onto the CANNT website and look under *About*

– *Board of Directors and Contacts* or call our toll free number.

CANNT has professional relationships with affiliate partners. Our affiliate partners include the American Nephrology Nurses Association (ANNA), the Canadian Nurses Association (CNA), the Kidney Foundation of Canada (KFoC), and the European Dialysis and Transplant Nurses Association (EDTNA/ERCA), and we are in the process of developing relationships with the National Association of Nephrology Technicians/ Technologists (NANT).

CANNT operations

At the 2011 annual conference in Calgary, Alberta, it was announced that Debbie Maure would be resigning from her position as administrative assistant of CANNT after the 2012 annual conference. Debbie has held the position of administrative assistant of CANNT since 1999. We are very pleased to announce that the new administrative assistant of CANNT is Heather Reid of Innovative Conferences and Communications. Heather has been the conference planner for CANNT for the past 10 years and her knowledge and expertise and long-term relationship with the association will be an asset.

We would also like to announce that CANNT has signed a contract with conference planner Heather Reid of Innovative Conferences and Communications until 2015. After each annual conference, the planning committee and the conference planner complete a written evaluation of the conference experience, which provides valuable feedback to the BOD and the members about the conference experience.

Standards of practice

Standard of practice documents for nursing and technology practice can be found on the CANNT website under the tab *Standards of Practice*. Marsha Wood and a team of nephrology experts wrote the *CANNT Standards of Nursing Practice* in August 2006. The *Standards of Technical Practice* was written in 2006 by ad hoc committee members consisting of technologists and advisors. The *Standards of Technical Practice* is currently being reviewed by the CANNT VP of Technologists and a team of experts.

In 2006, the Canadian Educators Network (CEN) guidelines for vascular access were published in the *CANNT*

Journal. These guidelines remain a mainstay for practitioners and nephrology professionals on the care, management and maintenance of hemodialysis vascular access. In 2010, the Canadian Hemodialysis Access Coordinators (CHAC) and Clinical Educators involved in the original guideline development began a review of the guidelines. The vascular access guidelines are expected to be published in the *CANNT Journal* in 2013.

Awards, bursaries and grants

Information about CANNT awards, bursaries and grants is available on the CANNT website and in the *CANNT Journal*. The deadline for submission is May 1 annually. We encourage all members to review awards, bursaries and grants on the CANNT website and to submit applications prior to the May 1 deadline. Each year, a committee reviews all applications and successful candidates are announced at the annual symposium.

Congratulations to this year's award winners. For those who attended the awards ceremony at the annual symposium in Ottawa, Ontario, we would like to thank you for your support.

Nominations committee

The deadline for the 'Call for Nominations' for the CANNT BOD is May 15 every year. This year's nominations included the position of VP Ontario

and president elect. The successful candidates were Krista Lovering, VP Ontario, and Roberta Prettie, President-Elect. A warm welcome to new BOD members Roberta and Krista.

The 2012–2013 BOD was announced during the Annual General Meeting (AGM) at the annual conference. Your 2012–2013 BOD members are Marilyn Muir (Past President), Colleen Wile (President), Roberta Prettie (President-Elect), Heather Dean (VP Western), Krista Lovering (VP Ontario), Roch Beauchemin (VP Quebec), Carolyn Bartol (VP Atlantic), Reg Quesnelle (VP Technologist), and Florence Holder (Website Coordinator and Treasurer).

Canadian Nurses Association (CNA)

There are currently approximately 1,200 nurses in Canada who are nephrology certified with the designation of CNeph(C) and the number continues to increase each year. Congratulations to both currently certified nephrology nurses and also to those who plan to write the certification exam. CNA certification review sessions are offered at the annual conferences in English and French (whenever possible). For more information about certification, check the CANNT website or <http://www.cna-aiic.ca/>. The association encourages all nephrology nurses who meet the certification criteria to write the CNA exam.

NOTICE BOARD

- ❖ Ottawa Supper Clubs—Contact Janet Graham, Nephrology Unit, Ottawa Hospital, jgraham@ottawahospital.on.ca
- ❖ March 9–12, 2013. Annual Dialysis Conference. Seattle Washington. Website: <http://som.missouri.edu/Dialysis/>
- ❖ April 20, 2013. Exam date for CNeph(C) certification exam. Contact Canadian Nurses Association Certification Program, e-mail: certification@cna-aiic.ca. Website: www.cna-aiic.ca. Toll-free phone number: 1-800-361-8404
- ❖ April 21–24, 2013. The American Nephrology Nurses Association (ANNA) National Symposium. Las Vegas, Nevada. Website: www.annanurse.org
- ❖ September 18, 2013. Nephrology Health Care Professionals Day.
- ❖ October 6–8, 2013. CANNT 46th National Symposium, St John's, Newfoundland. Conference Planner: Heather Reid: e-mail: hreid@innovcc.ca. Website: www.cannt.ca

Professional certification demonstrates your commitment to the nephrology specialty and the nursing profession.

One of my roles as past president has been CNA liaison for CANNT. It has been an honour and a privilege to participate in discussions with other nursing leaders in Canada and to represent you, our members, in this capacity.

Nephrology Health Care Professionals Day

Nephrology Health Care Professionals Day (NHCPD) is held annually, the third Wednesday in September. This year, NHCPD was held on Wednesday, September 17. NHCPD is a day to recognize and celebrate the valuable contributions provided by nephrology health care professionals (NHCP) to patients with kidney disease in your unit. NHCPs include nephrology nurses, technologists, nephrologists, pharmacists, dietitians and social workers. Check the CANNT website for more information and photos and

stories posted by your colleagues across Canada. We encourage you to participate in NHCPD annually by talking it up in your unit and sharing your unit's experiences with CANNT. Simply send us a short description of how your unit celebrated NHCPD or send us a photo. We look forward to hearing from you.

2012 annual symposium: October 25–27, Ottawa, Ontario

CANNT 2012 was a **HUGE** success. The conference would not have been possible without the commitment and dedication of the 2012 planning committee and conference planner, and the generous support from our industry sponsors. The planning committee and conference planner started planning for the annual conference 18 months in advance of the conference and their hard work paid off. *Success requires the efforts of many.* Thank you to our CANNT members and conference attendees, who helped to make

the annual conference a valuable and memorable experience.

The theme of the conference was “**Environments of Excellence**”. There were a total of 580 attendees, including 27 industry sponsors, 58 concurrent sessions with more than 70 presenters, and 31 poster presentations. There were representatives from every province, plus two delegates from Iceland, the president elect from the ANNA, a representative from the KFOC and the CNA.

At the AGM, President Marilyn Muir presented plaques to Debbie Maure and Gillian Brunier in recognition of their years of dedication and commitment to CANNT. I would like to take this opportunity, on behalf of the BOD, to extend an enormous thank you to Debbie Maure and Gillian Brunier for their expertise, kindness and wisdom. Both Debbie and Gillian have been with the association for more than 10 years and we wish them happiness and lasting success in the future.



Votre ca en action

Patty Quinan, inf., M.Sc. Inf., CNéph(C), Présidente sortante de l'ACITN



Le présent rapport consiste à vous informer, vos les membres de l'ACITN, sur les activités en cours et à venir de votre conseil d'administration (CA). Le CA est composé de neuf membres : présidente, présidente sortante, présidente élue, quatre vice-présidents régionaux (Ouest canadien, Ontario, Québec et Atlantique), vice-président, Technologie, et la coordonnatrice du site Web/trésorière (fonction combinée).

Adhésion

Nous comptons actuellement 420 membres. Infirmières, infirmiers, technologues et membres affiliés peuvent adhérer à l'ACITN. En tant qu'association professionnelle, le CA est constamment à la recherche de façons

nouvelles d'augmenter le nombre de ses membres. Nous offrons à ces derniers l'option de renouveler leur adhésion pour une année ou deux années consécutives. Depuis 2009, les cotisations d'adhésion n'ont pas augmenté. Nous vous encourageons à renouveler votre adhésion, car ceci assure la viabilité à long terme de notre Association.

En tant que membre de l'ACITN, vous pouvez bénéficier des nombreux avantages associés à votre adhésion à une association professionnelle. Certains de ces avantages incluent l'accès à notre Journal de l'ACITN (*CANNT Journal*), dont les articles sont soumis à un comité de lecture; un tarif réduit pour assister au Congrès annuel de l'ACITN; des occasions de réseauter avec des col-

lègues et des pairs par l'intermédiaire de forums de discussion et de conférences et une occasion de soumettre sa candidature aux programmes de prix, de bourses ou de subventions de recherche. Visitez notre site Web à www.cannt.ca (en anglais seulement) et cliquez sur l'onglet «*About*». Vous trouverez de plus amples renseignements sous la rubrique «*Why should I become a member*», en plus de l'information additionnelle sur les groupes de discussion sur la pratique clinique (*Refined Clinical Practice Groups, RCPG*), les forums de discussion ainsi que les prix, bourses et subventions offerts par l'ACITN.

Au nom du CA et de tous les membres de l'ACITN, je tiens à remercier nos généreux commanditaires pour leur

* Par souci de clarté et de concision, le genre masculin englobe à la fois le masculin et le féminin dans ce document.

appui à notre Association, notamment pour la tenue de notre Congrès annuel et le financement de nos programmes de prix, de bourses et de subventions. Nous vous sommes très reconnaissants de votre soutien.

Finances

Dans le but de maintenir la viabilité à long terme de notre Association, l'adjointe administrative et le CA passent régulièrement en revue les dépenses et discutent de façons innovatrices de générer des revenus et d'accroître notre profitabilité. Par exemple, les réunions printanières du CA se déroulent maintenant par conférence téléphonique au lieu d'une rencontre en personne et nous avons récemment fait l'acquisition du logiciel *Adobe Connect*, qui améliore le rendement et réduit les coûts associés aux réunions en personne.

Planification stratégique

La Planification stratégique, qui aide à orienter et à diriger les activités de l'ACITN, a été élaborée en 2007. Elle est en vigueur jusqu'en 2013 et sera révisée par le CA pour la période de 2013 à 2018. Notre mission consiste «à fournir un leadership et à promouvoir les meilleurs soins et la meilleure pratique en néphrologie par l'éducation, la recherche et la communication». L'ACITN s'est donné pour vision d'«être la clé de voûte de l'excellence des soins infirmiers et des technologies en néphrologie au Canada». Nos objectifs incluent, entre autres, l'augmentation du nombre de nos membres et le maintien de la viabilité à long terme de notre Association.

Journal

Le Journal de l'ACITN (*CANNT Journal*) est une publication à comité de lecture et une source d'information reconnue par les professionnels en néphrologie. Le Journal de l'ACITN est également indexé dans les bases de données CINAHL, MEDLINE et OVID et il est diffusé auprès des membres tous les trimestres. Nous encourageons à la fois les auteurs néophytes et ceux plus expérimentés à soumettre leurs articles aux corédactrices en chef du Journal pour révision et publication. Vous pouvez consulter le site Web de l'ACITN pour obtenir l'information relative à la rédaction d'un résumé, sous l'onglet «Education». Pour de plus amples renseignements, veuillez communiquer avec

les corédactrices en chef, Alison Thomas, à thomasal@smh.ca, et Jan Baker, à jbaker@haltonhealthcare.on.ca.

Le nom des gagnantes du Prix d'excellence de 2012 du Journal de l'ACITN a été dévoilé lors du Congrès annuel de 2012, à Ottawa. Félicitations à Lori Harwood et à Barb Wilson de London, en Ontario, pour leur article intitulé «*Moving beyond the perpetual novice: understanding the experiences of novice hemodialysis nurses and cannulation of arteriovenous fistula*». Vous pouvez consulter l'article (en anglais seulement) sur le site Web de l'ACITN à www.cannt.ca.

Site Web

Le site Web de l'ACITN est mis à jour de façon régulière et contient de l'information utile et des occasions d'affaires pour les professionnels en néphrologie, incluant les occasions de carrière, les forums de discussion et les normes de pratique infirmière et de pratique technique. L'ACITN a maintenant une page Facebook et un compte Twitter et offre en primeur cette année la possibilité aux participants qui ont assisté au congrès annuel qui s'est tenu à Ottawa, en Ontario, de remplir en ligne un formulaire d'évaluation. Cette évaluation est très conviviale. Vous pouvez imprimer ou envoyer par courriel votre certificat afin d'obtenir le nombre d'heures en éducation continue, une fois le processus d'évaluation terminé. Pour en savoir plus à ce sujet ou sur toute autre occasion emballante offerte aux membres de l'ACITN, rendez-vous à www.cannt.ca.

Communications

La communication entre le CA, les membres et les partenaires affiliés demeure une priorité à l'ACITN. La communication est la clé pour assurer la viabilité de notre Association. Pour ce faire, nous utilisons différents moyens pour communiquer avec nos membres; par exemple, l'adjointe administrative envoie de façon régulière par courriel des publipostages contenant l'information utile sur les activités en cours et les événements à venir. De plus, vous pouvez consulter sur le site Web à www.cannt.ca les rapports des vice-présidents régionaux, le mot de la présidente, le forum de discussion à l'intention des membres, les groupes de discussion sur la pratique et autres renseignements à propos des prix, des bourses et des subventions. Pour com-

muniquer avec un membre du CA, allez sur le site Web de l'ACITN et cliquez sur l'onglet «About—Board of Directors and Contacts» ou appelez-nous au numéro sans frais.

L'ACITN a établi d'étroites relations d'affaires avec ses partenaires affiliés, dont l'*American Nephrology Nurses Association* (ANNA), l'Association des infirmières et infirmiers du Canada (AIIC), la Fondation canadienne du rein (FCR) et la *European Dialysis and Transplant Nurses Association* (EDTNA/ERCA). Nous travaillons à nouer une relation d'affaires avec *National Association of Nephrology Technicians/Technologists* (NANT).

Services administratifs

Lors du Congrès annuel de 2011, qui s'est déroulé à Calgary, en Alberta, nous avons annoncé que Debbie Maure quitterait ses fonctions comme adjointe administrative de l'ACITN après le Congrès annuel de 2012. Debbie a occupé le poste d'adjointe administrative de l'ACITN depuis 1999. Nous avons le plaisir de vous annoncer qu'Heather Reid, d'*Innovative Conferences and Communications*, assumera les responsabilités d'adjointe administrative. Heather est notre planificatrice d'événements depuis 10 ans et son expertise et sa relation de longue date avec l'Association seront des atouts.

Nous vous informons également que l'ACITN a signé un contrat avec Heather Reid, d'*Innovative Conferences and Communications*, pour la planification d'événements jusqu'en 2015. À la fin de chaque congrès, le comité organisateur et la planificatrice d'événements rempliront une évaluation écrite sur l'expérience entourant le congrès, ce qui fournira une précieuse rétroaction au CA et aux membres sur le congrès.

Normes de la pratique

Vous trouverez sur le site Web de l'ACITN sous l'onglet «*Standard of Practice*», les documents sur la pratique infirmière et sur la pratique technique. Marsha Wood et une équipe d'experts en néphrologie ont rédigé les normes de la pratique infirmière en août 2006. Quant aux normes de la pratique technique, elles ont été rédigées par un comité spécial composé de technologues et de conseillers. Le vice-président, Technologie de l'ACITN, et un groupe d'experts révisent actuellement les normes de la pratique technique.

En 2006, les lignes directrices du *Canadian Educators Network* (CEN) en matière d'accès vasculaires ont été publiées dans le Journal de l'ACITN. Ces lignes directrices demeurent la référence en matière de soins, de prise en charge et d'entretien des accès vasculaires auprès des infirmières-praticiennes et des professionnels de la santé. En 2010, les coordonnateurs et coordonnatrices en accès pour l'hémodialyse du Canada (CHAC) et les éducateurs et éducatrices cliniques ayant participé à la rédaction de ces premières lignes directrices ont commencé à les réviser. Nous envisageons de publier les lignes directrices revues et corrigées sur les accès vasculaires dans le Journal de l'ACITN en 2013.

Prix d'excellence, bourses et subventions

L'information à propos des prix, des bourses et des subventions est accessible sur le site Web de l'ACITN et dans le Journal de l'ACITN. La date butoir pour poser une candidature est le 1^{er} mai. Nous encourageons tous les membres de passer en revue les critères d'admission pour l'ensemble des prix, des bourses et des subventions et de soumettre leurs formulaires de candidature avant la date limite du 1^{er} mai. Tous les ans, un comité examine une à une les mises en candidature. Le nom des gagnants est dévoilé dans le cadre du Congrès annuel de l'ACITN.

Joignez-vous à moi pour féliciter les lauréats de cette année. Nous désirons également remercier de leur soutien toutes les personnes présentes à la cérémonie de remise des prix qui a eu lieu durant le Congrès annuel à Ottawa, en Ontario.

Comité des mises en candidature

La date limite pour déposer sa candidature à un poste du CA est le 15 mai 2012. Cette année, les postes à pourvoir étaient : v.-p. pour l'Ontario et président(e) élu(e). Les candidates retenues sont Krista Lovering, v.-p. pour l'Ontario, et Roberta Prettie, présidente élue. Joignez-vous à nous pour accueillir chaleureusement Roberta et Krista au sein du CA.

Les membres du CA pour 2012-2013 ont été présentés lors de l'Assemblée générale annuelle (AGA) qui s'est tenue durant le Congrès annuel de l'ACITN. Voici votre nouveau CA : Marilyn Muir (présidente sortante), Colleen Wile (présidente), Roberta Prettie (présidente

élue), Heather Dean (v.-p. pour l'Ouest canadien), Krista Lovering (v.-p. pour l'Ontario), Roch Beauchemin (v.-p. pour le Québec), Carolyn Bartol (v.-p. pour l'Atlantique), Reg Quesnelle (v.-p., Technologie), et Florence Holder (coordonnatrice du site Web/trésorière).

Agrément de l'Association des infirmières et infirmiers du Canada (AIIC)

On compte approximativement 1 200 infirmières et infirmiers au Canada qui sont admis en néphrologie avec la désignation CNéph(C) et ce nombre ne cesse d'augmenter d'année en année. Félicitations aux personnes qui viennent de recevoir leur agrément ainsi qu'à celles qui envisagent de passer l'examen. Les séances de préparation de l'AIIC sont offertes en anglais et en français (lorsque cela est possible) dans le cadre du Congrès annuel de l'ACITN. Pour de plus amples renseignements sur l'agrément, consultez le site Web de l'ACITN ou celui de l'AIIC à <http://www.cna-aiic.ca/>. L'Association encourage toutes les infirmières et tous les infirmiers œuvrant en néphrologie, qui satisfont aux critères d'agrément, de passer l'examen de l'AIIC. L'agrément professionnel témoigne de votre engagement envers la spécialité de la néphrologie et la profession infirmière.

À titre de présidente sortante, j'ai assumé le rôle d'agente de liaison auprès de l'AIIC pour l'ACITN. Ce fut un honneur et un privilège de participer aux discussions avec d'autres intervenants du domaine des soins infirmiers au Canada et de vous représenter dans cette fonction.

Journée des professionnels de la santé en néphrologie

Tous les ans, la Journée des professionnels de la santé en néphrologie se tient le troisième mercredi de septembre. Cette année, nous avons célébré cette journée le 17 septembre 2012. En fait, durant cette journée, on prend le temps de reconnaître et de souligner les contributions exceptionnelles des professionnels de la santé en néphrologie qui œuvrent auprès de patients atteints d'une maladie du rein. Parmi ces professionnels de la santé, on compte les infirmières, les technologues, les pharmaciens, les diététistes et les travailleurs sociaux en néphrologie. Consultez le site Web de l'ACITN pour plus d'information à ce sujet. Nous y avons également affiché les photos ou les

comptes rendus que vos collègues d'un bout à l'autre du pays nous ont fait parvenir sur les activités qu'ils ont tenues lors de cette journée. Nous vous encourageons à participer tous les ans à la Journée des professionnels de la santé en néphrologie en organisant des activités dans vos unités respectives et en partageant avec vos collègues de l'ACITN vos expériences. Il suffit d'envoyer une courte description de l'activité que vous avez mise de l'avant dans votre unité. N'oubliez pas de joindre une photo. Il nous tarde de vous lire!

Congrès annuel de l'ACITN de 2012 : du 25 au 27 octobre, à Ottawa, en Ontario

Le Congrès annuel de l'ACITN de 2012 fut un IMMENSE succès! Le congrès n'aurait pu être possible sans l'engagement et le dévouement des membres du comité organisateur de 2012 et de la planificatrice d'événements ni sans la générosité de nos commanditaires de l'industrie. Le comité organisateur et la planificatrice d'événement ont entamé les préparatifs du congrès 18 mois avant sa tenue, mais leurs efforts ont été récompensés. *Le succès requiert des efforts collectifs et persévérants.* Merci à tous les membres de l'ACITN et à tous les congressistes, c'est grâce à votre participation que le Congrès annuel a été une expérience gratifiante et mémorable.

Le congrès avait pour thème «*Environnements d'excellence*». Voici le congrès en chiffres : 580 participants au total, incluant 27 commanditaires de l'industrie, 58 séances simultanées avec plus de 70 conférenciers et 31 affiches scientifiques. Nous avons des représentants de chaque province, plus deux délégués d'Islande, la présidente élue de l'ANNA, une représentante de la FCR et une représentante de l'AIIC.

À l'AGA, la présidente, Marilyn Muir, a remis des plaques commémoratives à Debbie Maure et à Gillian Brunier en reconnaissance de leurs années de service et de leur dévouement au sein de l'ACITN. Je profite de cette occasion pour remercier très sincèrement, au nom du CA, Debbie Maure et Gillian Brunier pour leur expertise, leur gentillesse et leur grande sagesse. Debbie et Gillian ont cumulé plus de 10 années de service au sein de l'Association et nous leur souhaitons beaucoup de bonheur et de succès dans leurs nouveaux projets.

American Association of Nephrology Nurses (ANNA) board meeting report, Quebec City, July 2012

By Roch Beauchemin, RN, BSS, MSN, NNP, VP Quebec

I was pleased to be invited to attend the ANNA board meeting in Quebec City in July, as CANNT's representative. Discussion was held amongst the attendees about a number of common issues of interest to Canadian and U.S. nephrology nurses. At the meeting, I presented the Canadian statistics on CKD to the group, outlining the increase in patient numbers in the age group of 45 to 64 years, and the considerable number of patients over 75 years of age. I also shared that in our hemodialysis unit we are now dialyzing patients of 85 or 90 years of age. We discussed a study done at the Royal Victoria Hospital in Montreal that demonstrated hemodialysis initiation when patients were older than the age of 70 was associated with poorer outcomes than in patients below that age (Hutchinson, Thomas, & MacGibbon, 1982). Predicting survival in adults with end stage renal disease: An age-equivalence index. *Ann Int Med*, 96, 417–423). Given our aging population of hemodialysis patients on both sides of the border, we all agreed that this is an ongoing challenge.

We also had the opportunity to discuss the diversity in staffing models in the hemodialysis units in the U.S., as compared to Canada. The ANNA board members were quite impressed and interested to learn that Canadian units had such a high ratio of RNs compared to dialysis units in the United States, where they have a much lower ratio of RNs in their units and, instead, have patient care technicians providing direct care. One of the challenges in the U.S. is a high number of foreign nursing companies that are recruiting nurses with very attractive compensation packages—this adds to the nursing shortage they are experiencing. We also discussed nursing models of care—with many different models in use across the nation, from pri-

mary nursing to Watson's model of caring, to the adaptation of different models that meet individual unit or program needs.

From an association perspective, ANNA shares many of the same challenges that CANNT is facing: decreasing membership numbers and a reduction in the number and value of corporate sponsorships—both of which have impact on the viability of the organization over time. While not able to find specific solutions to our respective challenges, we discussed opportunities to work together, as neighbours and colleagues, as we move forward to represent nephrology nursing in these changing times.

Reference

Hutchinson, T.A., Thomas, D.C., & MacGibbon, B. (1982). Predicting survival in adults with end stage renal disease: An age-equivalence index. *Ann Int Med*, 96(4), 417–423.



Roch Beauchemin, CANNT VP Quebec, with members of the ANNA Board of Directors, 2012.

Celebrating Nephrology Healthcare Professionals Day at the Peterborough Regional Health Centre

We started the morning by placing posters around the hospital and decorating the unit. We created a wall that was filled with patients' comments about the quality of care they receive, and the entire team that works to pull it all together.

Coffee and cookies greeted staff and a pizza lunch was held with the day, evening and weekend shift staff. Our

VP paid a visit to the unit and distributed memo pads that said "Thank you for everything you do" and a pen. Our president blogged about the team, recognizing its amazing efforts.

We've left the patient comment wall up, as many people stop and read the comments—they are wonderful!



Blood pressure knowledge in hypertensive hemodialysis patients

By Zorica Kauric-Klein, RN, APRN-BC, ANCC, PhD

Copyright © 2012 Canadian Association of Nephrology Nurses and Technologists

Abstract

Objective: The major purpose of this quantitative study was to determine if a supportive educative nursing intervention incorporating blood pressure (BP) education, monitoring, goal setting and reinforcement would improve BP control in a chronic hemodialysis (HD) population. One of the specific aims of this study was to determine if the intervention increased BP knowledge in the treatment group compared to the usual care group at 12 weeks and if that knowledge translated into improved BP control.

Design: A randomized experimental design.

Sample: One hundred and eighteen participants recruited from six HD units in the Detroit metro area.

Method: The study group received BP education sessions and a 12-week intervention. The intervention consisted of the participants monitoring and recording their BP, salt and fluid intake daily for 12 weeks. BP, fluid and salt logs were reviewed weekly with the principal investigator (PI) to determine if goals were met or not met. Reinforcement was given for goals met and problem-solving offered when goals were not met. The control group received standard care.

Findings: Patients had fairly good levels of knowledge about blood pressure control behaviours at baseline and there was no significant improvement at follow-up. There was no significant difference in BP knowledge scores between the two groups at 12 weeks ($t = 1.4$, $p = .16$). There was no significant increase in BP knowledge scores within the treatment group at 12 weeks ($t = -.74$, $p = .47$). Overall, there was a significant decrease in systolic ($t = 3.02$, $p = .003$) and diastolic BPs ($t = .48$, $p = .001$) in the treatment group compared to the control group at 12 weeks. There were no significant correlations between BP knowledge scores and systolic BP or diastolic BP.

Key words: blood pressure, Blood pressure knowledge, hemodialysis, blood pressure monitoring, goal setting and reinforcement

Zorica Kauric-Klein, RN, APRN-BC, ANCC, PhD,
Nephrology Nurse Practitioner, Michigan Kidney Care,
William Beaumont Hospital, Royal Oak, Michigan, Henry
Ford Health System, Detroit, Michigan, Davita Health
System, Wayne State University

Address correspondence to: Zorica Kauric-Klein, RN, APRN-BC, ANCC, PhD, 130 Martin Dr., SS4 Belle River, ON N0R-1A0

Phone: 519-979-3763; Email zklein@mnsi.net

Submitted for Publication: March 19, 2012.

Accepted for publication in revised form: July 22, 2012.

Introduction

Hypertension in patients on chronic HD contributes significantly to their morbidity and mortality. Cardiovascular diseases account for approximately 50% of deaths in patients with renal disease (USRDS, 2010). Hypertension in ESRD is a major risk factor for the development of left ventricular hypertrophy (LVH), congestive heart failure, coronary artery disease, arrhythmias and cerebrovascular complications (Zoccali, Benedetto, Tripepi, & Mallamaci, 2004).

Hypertension is extremely common among patients undergoing chronic HD, with studies showing a prevalence of 75% to 100% (Agarwal et al., 2003; Horl & Horl, 2002; Morse, Dang, Thakur, Zhang, & Reisin, 2003; Mettal et al., 1999; USRDS, 2010). Given these alarming statistics, and an understanding of the sequelae of hypertension (stroke, cardiovascular death), it is imperative that efforts be directed at controlling BP.

The reasons why blood pressure is poorly controlled in the chronic HD population are poorly understood. Possible reasons that have been identified for uncontrolled hypertension in this population include poor self-care behaviours such as excessive salt and fluid intake, the practice of routinely holding BP meds prior to HD, nonadherence to BP regimens, and missing HD treatments (Agarwal, 2003). A review of the literature indicates a lack of available evidence about BP knowledge and BP self-care practices in patients requiring HD.

The major purpose of this quantitative study was to determine if a supportive educative nursing intervention incorporating blood pressure (BP) education, monitoring, goal setting and reinforcement would improve BP control in a chronic HD population. One of the specific aims of this study was to determine if the intervention increased BP knowledge in the treatment group compared to the usual care group at 12 weeks, and if that knowledge translated into improved BP control. The hypotheses that were tested in this study were:

Hypothesis 1: Chronic HD patients randomized to a supportive-educative intervention will have increased BP knowledge scores compared to baseline scores and will have greater BP knowledge than the control group at 12 weeks.

Hypothesis 2: There will be a relationship between increased BP knowledge and decreased systolic and diastolic BPs.

Methods

Design

A randomized controlled design was used to determine if a supportive educative nursing intervention improved BP knowledge in a chronic HD population. Because of the fear of diffusion of the intervention across HD units, the HD units (rather than individual patients) were randomized to

intervention or control by flipping a coin. BP knowledge scores and average systolic and diastolic BPs were collected at baseline and 12 weeks. Demographic data (age, gender, race, education, income, total comorbidities, and social support) were also collected to determine if there were any significant relationships between variables and baseline and 12-week BP knowledge scores.

Setting

Data were collected from six HD units. Four units were located in the metropolitan Detroit area and were affiliated with major health care systems and two of the control units were located in the inner city Detroit region. There were no formal education programs on BP in any of the HD units. Some of the nurses or HD technicians would reinforce the need for improved BP control or the relationship between fluid gains and BP, however, this was not done in a consistent manner. The health care provider (physician, physician's assistant, or nurse practitioner) would visit the patient on a weekly basis and review BPs, fluid gains and make BP medication adjustments, as needed.

Recruitment and sample

A convenience sample was drawn from six outpatient HD units in Michigan. The largest unit had approximately 182 patients with a racial composition of 65% African American and 35% Caucasian and other. The second largest unit had approximately 124 patients with a racial composition of 90% African American and 10% Caucasian and other. The third HD unit had approximately 90 patients with racial composition of 90% African American and 10% Caucasian and other. The fourth unit had 83 patients with a racial composition of 60% African American and 40% Caucasian and other. The two other units used for recruitment and enrolment were located in the inner city of Detroit. The largest control unit had 126 patients and the smaller unit had only 64 patients. Both of the control groups were made up of 96% African American and 4% Caucasian and other. A total of six HD units with a total number of 836 potential participants yielded 118 study participants.

After approval from IRB and the directors and managers of the HD units, the HD staff and physician in charge were in-serviced by the PI on the study. The medical director and nurse manager were provided the participant eligibility criteria. Patients were considered eligible for the study if they were (a) > 18 years, (b) had a four-week average pre HD systolic BP > 150 mmHg or diastolic BP > 90 mmHg, and (c) read and spoke English. Exclusion criteria included: (a) on HD less than six months; (b) scheduled for renal transplantation; (c) illicit drug use history; (d) history of mental illness; or (e) lack of orientation to person, time or place; (f) major health problem such as terminal cancer or HIV; and (g) missing greater than two HD treatments over a four-week baseline screening period. If determined eligible, the medical director and/or nurse manager of each HD unit initially contacted patients. If patients indicated they were interested in participating in the study they were referred to the PI. The PI then explained the study to the potential participant in detail and provided the opportunity to ask and answer questions in a private room in the HD unit. If interested, the potential participant was then asked to sign a written consent.

Intervention

The experimental group received two individually conducted educational sessions one week apart on BP control in ESRD. The educational sessions were conducted in the HD unit. The first educational session lasted approximately 10 to 15 minutes. The content of the educational sessions was developed by the PI and based on the NKF-KDOQI (2005) clinical guidelines for hypertension in ESRD. The main objectives of the educational sessions were to explain the underlying pathophysiology of hypertension in ESRD, to identify risks associated with having hypertension in ESRD, and to describe the self-care interventions or goals that can improve BP control. Goal setting was established between the participants and the investigator before the initiation of the intervention. The goals were: a) Pre HD BP < 140/90 mmHg and post HD BP < 130/80 mmHg, b) salt intake (< 2 gm/day or 1 tsp/day), c) fluid intake (< 1500 ml/day) or less than 2.5 kg weight gain in between HD treatment, d) 100% adherence to HD regimen, and e) 100% adherence to medication regimen.

At the second educational session, the treatment participants were taught to use a home BP apparatus, and to complete BP and fluid logs and salt intake checklists. They were also provided with educational pamphlets on sodium and fluid restriction in an effort to facilitate monitoring of behaviours related to BP control and to assist with meeting goals. The participants were instructed to bring the logs to the HD unit on a weekly basis to review with the PI. The treatment group was able to keep their BP monitor at the completion of the study in appreciation of their participation.

The PI followed up with the treatment patients weekly for 10 to 15 minutes to educate, guide and support patients toward meeting self-care goals. The PI provided BP education and guidance by reviewing BP, salt and fluid logs in order to determine if predetermined goals had been met. The PI offered verbal positive reinforcement for goals met and further exploration and problem solving when goals were not met.

The control group received standard care. Standard care involved BP monitoring and medication adjustments by health care providers in the HD unit on a weekly basis, as needed. At the conclusion of the study, control group participants also received a home BP monitor in appreciation of their participation. All data were collected by the PI in the HD units that the participants attended. Data collection was completed over 13 months from June 2009 until July 2010.

Statistical analyses

Statistical analysis was conducted using SPSS 17. Differences in demographic factors between groups at baseline were controlled for using analyses of covariance. Independent t-tests were conducted to determine if there were significant differences between the two groups in BP knowledge scores at baseline and 12 weeks. Paired t-tests were conducted to determine if there were within-group differences in BP knowledge scores from baseline to 12 weeks. Correlational analyses were conducted to determine if there were relationships between BP knowledge scores and BP.

Results

The demographic characteristics of the sample are described in Table 1. An equal number of participants participated in the control group (n = 59) and the intervention group (n = 59).

The participants in this sample were predominately African American, and had an average age of 60 years. Almost half of the sample earned a total household yearly income below \$10,000 and the majority of the sample was unemployed. The sample was equally represented by males and females. The control group was entirely African American, significantly younger, mostly single (71.1% versus 54%), and had less yearly income than the treatment group.

In terms of comorbidities, 50% of the sample had diabetes, 33% of the sample had preexisting atherosclerotic heart disease and 25% of the sample had congestive heart failure (CHF). The only significant difference in comorbid conditions between the two groups was for CHF, which was more prevalent in the treatment group. The majority of the sample was taking BP medications with half of the sample taking three or more BP medications to help control their BP. The two groups were not statistically different in systolic BPs or fluid gains at baseline, but were statistically different in diastolic BP with the control group having a statistically significant greater diastolic BP.

Blood pressure control in HD knowledge

Since a review of the literature did not reveal any instruments that measured the knowledge necessary to control BP in HD, the investigator developed the BP Control in HD Knowledge Scale. The BP Control in HD Knowledge Scale (see Figure 1) measured the participant's comprehension of behaviours necessary for BP control in HD. The five-minute, seven-item tool was developed from National Kidney Foundation (NKF) guidelines (2005), which identified specific self-care behaviours that are needed to control BP in HD. The major causal factors identified by the NKF-Kidney Disease Outcomes Quality Initiative (K-DOQI) Guidelines (2005) for hypertension in HD included increased attention to fluid and salt intake restriction and adherence to BP regimens and HD regimens.

The scale was given to all participants in the intervention and control groups at baseline and 12 weeks. The five-minute, seven-item instrument asks participants to rate each item on a scale of 1 to 7 where 1 indicates strongly disagree and 7 indicates strongly agree. Total scores were calculated as average scores on each item, with average scores near 7 indicating high levels of BP control knowledge, with the exception of question 5, which was reverse coded.

To assess whether the seven items that were summed to create the BP knowledge score formed a reliable scale, Cronbach's alpha was computed. The alpha for the BP Control in HD Knowledge scale was 0.62, which indicates a borderline level of internal consistency. Two of the seven items had very low internal inter-item correlations. Item one: "I have high blood pressure" had an inter-item

Table 1: Demographic characteristics of the sample (N = 118)

Variable	Intervention Group (n = 59) M (SD)/ Freq (%)	Control Group (n = 59) M(SD)/ Freq (%)	T test/ Chi Square	P
Age	63.4 (16.4)	56 (14.8)	- 2.6	.01
Gender				
Male	28 (47)	32 (54)	.54	.46
Female	31 (53)	27 (46)		
Race				
AA	42 (71)	59 (100)	19.8	.00
Caucasian	14 (23.7)	0 (0)		
Middle Eastern	3 (5)	0 (0)		
Income				
< \$5,000	1 (1.6)	11 (18.6)	20.8	.00
\$5,000–\$9,999	20 (33.8)	26 (44)		
\$10,000–\$19,999	14 (23.7)	15 (25.4)		
\$20,000–\$29,000	12 (20.3)	6 (10)		
\$30,000–\$49,999	7 (11.8)	0 (0)		
> \$50,000	5 (8.5)	1(1.6)		
Educational level				
< Grade 8	2 (3.4)	4 (6.8)	10.7	.64
Some High School	11 (18.6)	15 (25.4)		
HS Graduate	15 (25.4)	15 (25.4)		
Some College	20 (33.8)	21 (35.6)		
College Grad	11 (18.6)	4 (6.7)		
Employment				
Not employed	47 (80)	52 (88.1)	4.5	.10
Part-time	11 (18.6)	4 (6.8)		
Full-time	1 (1.7)	3 (5.0)		
Married or living with a partner				
Yes	27 (45.8)	17 (28.8)	3.6	.06
No	32 (54.2)	42 (71.1)		
Note AA: African American, SD: standard deviation				

total correlation of 0.16. Item five: “I drink more than six 8-oz glass of fluid a day” had an inter-item correlation of 0.12. If these two items were deleted, the alpha for the five items would be 0.69. A Pearson’s correlation ($r(118) = 0.80, p = 0.00$) was computed to assess test-retest reliability of the BP knowledge test scores at baseline and 12 weeks, which indicated good test-retest reliability.

The following describes the findings for each item on the BP Control in HD Knowledge Scale (Table 2).

Question 1: I have high blood pressure.

The mean score for this item was 6.5 with a range of answers from 1 to 7. Despite having high BPs, approximately 8.5% of

the sample ($n = 10$) indicated that they did not have high BP or answered that they were unsure if they had high BP. When these findings were explored further, many participants indicated that they did not feel they had high BP because their BP was controlled with blood pressure medications.

Question 2: Uncontrolled BP can lead to serious complications.

The mean score for this question was 6.9 with a range of answers from 4 to 7. Ninety-two per cent of the sample felt that high BP could lead to serious complications.

Figure 1: BP control in HD knowledge scale								
1. I have high blood pressure.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree
2. Uncontrolled BP can lead to serious complications.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree
3. Eating a low salt diet will help keep my blood pressure under control.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree
4. Maintaining my fluid gains to 2–3 kg in between hemodialysis treatments will keep blood pressure under control.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree
5. I drink more than six 8oz glasses of fluid a day.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree
6. Taking my blood pressure medications as prescribed will help keep my blood pressure under control.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree
7. Following my prescribed hemodialysis regimen will help keep my blood pressure under control.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree

Table 2: BP knowledge item scores				
BP knowledge scale item	Control M(SD) baseline	Intervention M(SD) baseline	Control M(SD) 12 weeks	Intervention M(SD) 12 weeks
I have high BP.	6.5 (1.3)	6.4 (1.3)	6.2 (1.6)	6.1 (1.6)
Uncontrolled BP can lead to serious complications.	6.9 (.22)	6.9 (.52)	6.9 (.52)	6.9 (.56)
Eating a low salt diet will help keep my BP under control.	6.3 (1.3)	6.1 (1.5)	6.3 (1.3)	6.3 (1.4)
Maintaining my fluid gains to 2–3 kg in between HD will keep my BP under control.	6.3 (1.1)	5.5 (1.6)	6.2 (1.2)	5.8 (1.7)
I drink more than six 8-oz glasses of fluid a day.	5.1 (1.8)	5.1 (2.0)	5.4 (1.6)	5.5 (1.7)
Taking my BP medications as prescribed will help keep my BP under control.	6.6 (.92)	6.1 (1.2)	6.5 (1.0)	6.3 (1.2)
Following my prescribed HD regimen will help keep my BP under control.	6.6 (.92)	6.5 (1.2)	6.9 (.45)	6.6 (1.1)

Question 3: Eating a low salt diet will help keep my blood pressure under control.

Controlling salt intake has been linked to improved extra-cellular volume and BP control in HD patients (Charra, 2007). The mean score for this item was 6.2 with a range of scores from 1 to 7. Approximately 18% of the sample were unsure or did not feel that eating a low-salt diet would help keep their BP under control.

Question 4: Maintaining my fluid gains to 2–3 kg in between hemodialysis treatments will keep my blood pressure under control.

The mean score for this item was 5.9 with a range of scores of 1 to 7. Although the literature indicates a strong correlation between fluid gains and BP, 22% (n = 26) of the sample did not feel or were unsure if fluid gains were related to BP. When further questioned, many of the participants indicated that despite keeping their fluid under control, their BP remained high.

Question 5: I drink more than six 8-oz glasses of fluid a day.

The average mean answer for this question was 5.1 with a range of answers from 1 to 7. Thirty-four per cent of the sample was somewhat in agreement with this statement. However, 65% of the sample disagreed with the statement. Some of the participants were unsure of exactly how much fluid an 8-oz glass contained.

Question 6: Taking my blood pressure medications as prescribed will help keep my blood pressure under control.

Almost 71% of the sample strongly agreed with the statement. The mean score was 6.5 with a range of answers from 2 to 7. Approximately 12.7% of the sample did not agree or strongly disagreed with the statement, stating that even if they took their BP meds their BP was still not under control. Many patients indicated they were being asked to hold their BP meds before HD. When this comment was explored further, many patients indicated that their BP was falling during HD treatment and they were told by their health care provider or technician to hold their BP medications. This finding was similar to that found by Agarwal (2003), who found that many patients on hemodialysis held their BP medications before hemodialysis.

Question 7: Following my prescribed hemodialysis regimen will help keep my blood pressure under control.

The average mean score for this item was 6.6 with a range of scores from 2 to 7. The majority of the sample (86%; n = 103) agreed or strongly agreed with the statement that adherence to HD regimens was related to BP control. Approximately 6% (n = 7) did not agree or strongly disagreed and did not feel that adherence to HD regimens resulted in improved BP control.

BP knowledge

Overall, patients had fairly good levels of knowledge about BP control behaviours at baseline and there were no significant improvement in scores at 12 weeks (Table 3). BP knowledge scores for the sample ranged from a minimum of 17 to a maximum of 49, with higher scores indicating more

BP knowledge. The mean BP Control in HD Knowledge score for the sample was 43.5 (SD = 4.5) at baseline and 43.9 (SD = 4.7) at 12 weeks. At baseline, the treatment group (M = 42.5, SD = 4.7) had a statistically significant lower BP knowledge score than the control group (M = 44.5, SD = 4.1) ($t = 2.4$, $p = 0.02$). This indicates that the treatment group scored 87% correct on the BP knowledge test compared to the control group who scored 91% correct at baseline. A possible explanation for this finding is that the health care providers who saw the patients in the control unit focused more on BP control compared to the treatment units. At 12 weeks, the treatment group's score increased slightly to 43.4 (SD = 5.5) (88% correct) with no change in the control group's score 44.4 (SD = 3.8) (91% correct). BP knowledge scores were not significantly different between the two groups at 12 weeks ($t = 1.4$, $p = 0.16$).

No correlations were found between baseline BP knowledge and systolic BP ($r = 0.06$, $p = 0.52$) and diastolic BP ($r = -0.02$, $p = 0.84$). A significant relationship was found between baseline BP knowledge and 12 week BP knowledge. A significant relationship was found between baseline BP knowledge and baseline fluid gains ($r = -0.30$, $p = 0.001$), indicating the more BP knowledge a participant had at baseline, the less average fluid gained in between HD treatments. No significant relationship was found between BP knowledge and average 12-week systolic BP ($r = -0.60$, $p = 0.52$) or diastolic BP ($r = -0.03$, $p = 0.78$). No significant correlations were found between the demographic variables (age, gender, race, education, income, social support) and baseline and 12-week BP knowledge scores.

Discussion

BP knowledge appeared to be relatively high in this sample indicating that the sample had a good knowledge of factors that control BP in HD. The intervention did not significantly increase BP knowledge scores in the treatment group at 12 weeks. There were no significant relationships found between the demographic variables and BP knowledge scores. Findings revealed no significant association between BP knowledge and systolic BP and diastolic BP at baseline and 12 weeks. This information indicates that BP knowledge

Table 3: Total BP knowledge scores

BP knowledge	Treatment (n = 59)	Control (n = 59)
Baseline Mean (SD)	42.5 (4.7)	44.5 (4.1)
12 weeks Mean (SD)	43 (6.5)	44.5 (4.1)
Baseline between group t-test (p)	2.4 (.02)	
12 week within group t-test (p)	-.74 (.47)	.32 (.75)
12 week between group t-test (p)	1.4 (.16)	

does not translate into behaviour change in this sample indicating that other factors influenced the significant change in BP at 12 weeks.

These findings are similar to those found in a systematic review conducted by Fahey, Schroeder and Ebrahim (2006) who found that education alone, directed at patients, was unlikely to influence control of BP as a single intervention. Other studies in the hemodialysis population have also found that an increase in knowledge was not always related to improved adherence to self-care behaviours or clinical and/or psychological outcomes (Karamanidou, Weinman, Horne, 2008; Molaison & Yadrack, 2003). A possible reason to explain this finding is that with education alone, patients may take a more passive role in terms of responsibility for care and are less engaged in their self-management. Thus, we can conclude that knowledge is a necessary but insufficient condition for behaviour change and it appears that more proactive strategies such as self-monitoring, goal setting and reinforcement should be included in interventions to help patients decrease their blood pressure.

Limitations

One of the major limitations of this study was the randomization process. Because of fear of contamination of the intervention across HD units, the randomization process was carried out by the HD unit, rather than by the individual patient. This resulted in the control and treatment groups being significantly different on a number of variables and limits the generalizability of the findings. The reliability of the BP knowledge scale was also questionable. Two of the items had low total inter-item correlations and need to be re-examined for wording problems and conceptual fit.

Further studies need to conduct stratified random sampling in order to ensure that the samples are representative of the general HD population. Future studies also need to explore why some HD patients perceive they do not have high BP despite being on BP medications. These patients

need to understand that they are hypertensive and would not have their BP controlled if they were not on BP meds. Another factor that needs to be targeted in this population is salt restriction. Approximately 20% of this sample did not believe or were unsure if salt intake was related to blood pressure. Health care providers need to inform HD patients of the influence of salt intake on their BP and offer recommendations such as “no added salt” to help HD patients control their salt intake.

Another interesting finding was 22% (n=26) of the sample did not feel or were unsure if fluid gains were related to BP. Many of the participants were unsure of how much they should drink on a daily basis. Many indicated that they did not know how much the recommended 6- to 8-ounce glass of fluid per day was. Twelve per cent of the sample did not feel that taking their BP medications would keep their BP under control. The practice of withholding BP medications before HD also needs to be explored in future studies.

Implications for nephrology nurses

Nephrology nurses are frequently the major health caregivers for HD patients and, as such, can be instrumental in helping HD patients improve BP control. This study suggested that BP education alone did not significantly improve blood pressure in this sample. Nurses need to use other interventions such as monitoring, goal setting and reinforcement to improve BP control. They also need to target their efforts on helping HD patients understand the importance of salt and fluid restriction and adherence to BP medication and HD regimens.

Acknowledgements

My dissertation committee: Dr. Nancy Artinian, Dr. Hossein Yarandi, Dr. Rosalind Peters and Dr. Toni Abbey and Omron.

Sources of funding support: ANNA Evidence Based Practice Research Grant, Graduate School and College of Nursing at Wayne State University Dissertation Research Support Grant.

References

- Agarwal, R., Nissenson, A., Batille, D., Coyne, D., Trout, J., & Warnock, D. (2003). Prevalence, treatment and control of chronic hemodialysis patients in the United States. *American Journal of Medicine*, 115(4), 291–297.
- Charra, B. (2007). Fluid Balance, dry weight, and blood pressure in hemodialysis. *Hemodialysis International*, 11, 21–31.
- Fahey, T., Schroeder, K., & Ebrahim, S. (2006). Interventions used to improve control of blood pressure in patients with hypertension (Review). *Cochrane Database of Systematic Reviews*, Issue 4, Art. No.: CD005182.
- Horl, M., & Horl, W. (2002). Hemodialysis-associated hypertension: Pathophysiology and therapy. *American Journal of Kidney Diseases*, 39(2), 227–244.
- Karamanidou, C., Weinman, J., & Horne, R. (2008). Improving haemodialysis patients' understanding of phosphate-binding medications: A pilot study of psycho-educational intervention designed to change patients' perceptions of the problem and treatment. *British Journal of Health Psychology*, 13, 205–214.
- Mettal, S., Kowalski, E., Trenkle, J., MacDonough, B., Halinski, D., Devlin, K., Boylan, E., Flaster, E., & Maesaka, J. (1999). Prevalence of hypertension in a hemodialysis population. *Clinical Nephrology*, 51, 77–82.
- Molaison, E., & Yadrack, M. (2003). Stages of change and fluid intake in dialysis patients. *Patient Education and Counseling*, 49, 5–12.
- Morse, S., Dang, A., Thakur, V., Zhang, R., & Reisin, E. (2003). Hypertension in chronic dialysis patients: Pathophysiology, monitoring and treatment. *American Journal of the Medical Sciences*, 325(4), 194–201.
- National Kidney Foundation (2005). Kidney Disease Outcomes Quality Initiative (K/DOQI) K/DOQI clinical practice guidelines on hypertension and antihypertensive agents in chronic kidney disease. *American Journal of Kidney Disease*, 43, S1–S290.
- U.S. Renal Data System. (2010). *USRDS 2010 Annual Data Report: Atlas of End-Stage Renal Disease in the United States*. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases.
- Zoccali, C., Benedetto, F., Tripepi, G., & Mallamaci, F. (2004). Cardiac consequences of hypertension in hemodialysis patients. *Seminars in Dialysis*, 17(4), 299–303.

Appendix 1: Salt intake checklist

Name: _____										
Please circle the number of times that you have eaten the following foods in the past three days, not counting today. It is important that you fill in the questionnaire as accurately as possible, indicating every time you have eaten any of the foods mentioned. We counted the occasions, not the amounts (for example, three slices of bread score 1, if eaten on one occasion).										
1. Food with salt added in cooking	0	1	2	3	4	5	6	7	8	
2. Food with salt added at the table	0	1	2	3	4	5	6	7	8	
3. Cured meats such as ham, bacon, sausages or luncheon meat	0	1	2	3	4	5	6	7	8	
4. Corned/canned meats, meat pastes	0	1	2	3	4	5	6	7	8	
5. Smoked or canned fish, fish pastes (salted)	0	1	2	3	4	5	6	7	8	
6. Processed cheese, cheese spreads	0	1	2	3	4	5	6	7	8	
7. Olives, salted nuts, crackers, pretzels, potato chips	0	1	2	3	4	5	6	7	8	
8. Canned vegetables, canned soups (other than unsalted)	0	1	2	3	4	5	6	7	8	
9. Packet soups, beef/chicken cubes	0	1	2	3	4	5	6	7	8	
10. Salad dressings, sauces, condiments (other than unsalted)	0	1	2	3	4	5	6	7	8	
11. Pot pies and TV dinners	0	1	2	3	4	5	6	7	8	
12. Ordinary (salted) butter or margarine	0	1	2	3	4	5	6	7	8	
13. Ordinary (salted) breads	0	1	2	3	4	5	6	7	8	
14. Ordinary (salted) breakfast cereals	0	1	2	3	4	5	6	7	8	
15. Cakes, pastries, biscuits (other than low-sodium/salt)	0	1	2	3	4	5	6	7	8	
16. Any salt-containing food that is not mentioned above	0	1	2	3	4	5	6	7	8	
Please circle:										
Have you decreased your salt intake over the last week?	1	2	3	4	5					
	Not at all		Some of the time			All of the time				
If yes, did you positively reinforce yourself for goals met? (ie. Positive comments or engaging in pleasurable activities)	1	2	3	4	5					
	Not at all		Some of the time			All of the time				
If goals were not met, list possible reasons and what you plan to do over the next week to help meet your goals:										

Appendix 2: 24 hour fluid intake recall

Name: _____

Record what you drank and the amount over the last 24 hrs from 6 a.m. yesterday to 6 a.m. today. Include associated thoughts, emotions and behaviours (i.e., I drank more because I went to a party, or was really thirsty).

Breakfast	Amount	Thoughts, Emotions, Behaviours
Snack		
Lunch		
Snack		
Dinner		
Snack		

Please circle:

How close were you to meeting your goals?	1	2	3	4	5
	Not at all		Some of the time		All of the time
If yes, did you positively reinforce yourself for goals met? (i.e., Positive comments or engaging in pleasurable activities)	1	2	3	4	5
	Not at all		Some of the time		All of the time
If goals were not met, list possible reasons and what you plan to do over the next week to help meet your goals:					

Appendix 3: Home BP log

Name: _____

Target BP: _____

Record your BP every morning and afternoon at the same time. Make comments in the comment box about possible reasons for BP results.

Date	Time (a.m.)	Blood pressure	Comments	Time (p.m.)	Blood Pressure	Comments
Sample 12/05	8:30	148/90	Forgot to take meds	6:30	156/88	Stressful day

Please circle:

Were BP goals met pre HD BP < 140/90 and post HD BP < 130/80?	Yes	No
If yes, did you positively reinforce yourself for BP goals met? (i.e., Positive affirmations or engaging in pleasurable activities)	Yes	No

If goals were not met, list possible reasons and what you plan to do over the next week to help meet your goals:

The availability of exercise rehabilitation programs in hemodialysis centres in Ontario

By Sunny Ma, MScPT, Jonathan Lui, MScPT, Dina Brooks, BScPT, PhD, and Trisha L. Parsons, BScPT, PT, PhD

Copyright © 2012 Canadian Association of Nephrology Nurses and Technologists

Abstract

Background: Exercise training is effective at promoting physical fitness, cardiovascular outcomes, and quality of life amongst persons with chronic kidney disease. To our knowledge, no published data exist to date on the prevalence of exercise programs offered to Canadians undergoing dialysis. The study purpose was to characterize existing exercise programs in hemodialysis centres in the province of Ontario.

Methods: An online survey was created and distributed to 95 dialysis facilities across Ontario.

Results: There was a 61% survey response rate. Only eight facilities offered exercise programs, which included intradialytic and cardiac rehabilitation programs. Lack of funding ($n = 22$), lack of human resources ($n = 18$), and lack of equipment ($n = 17$) were reported as the most commonly perceived barriers of offering an exercise program.

Conclusion: Although exercise has been shown to be effective, prevalence of programs is low. Work is underway to administer the online survey tool to dialysis programs across Canada.

Key words: exercise, rehabilitation, hemodialysis, Canada, knowledge translation

Introduction

There are many negative consequences to chronic kidney disease that threaten the well-being, independence and survival of Canadians at risk for or living with this disease (Parsons & King-VanVlack, 2009). Many of the sequelae of renal failure, whether as result of the disease itself or the consequential inactivity, can be improved with exercise (Parsons & King-VanVlack, 2009; Segura-Ortí & Johansen, 2010; Heiwe & Jacobson, 2011). Exercise can be performed during dialysis ("intradialytic") at the treatment facility. Alternatively, exercise can also be performed between dialysis treatments ("extradialytic") at an outpatient rehabilitation clinic, at local community fitness centres, or at home. To date, intradia-

lytic exercise programs have received the most attention in the published literature (Parsons & King-VanVlack, 2009). Multiple studies have found that intradialytic aerobic exercise can improve dialysis efficacy by enhancing solute removal (Kong, Tattersall, Greenwood, & Farrington, 1999; Parsons, Toffelmire, & King-VanVlack, 2006), sleep quality (Afshar et al., 2011; Reboredo et al., 2010; Sakkas et al., 2008), aerobic capacity (Segura-Ortí & Johansen, 2010), and quality of life (Kolewaski et al., 2005). No significant adverse events have been reported with respect to intradialytic exercise programs over 30 years of published evidence. However, there has been no published randomized controlled trial to date, which has prospectively evaluated the long-term safety of intradialytic exercise training. Furthermore, the safety of these programs appears to be dependent on appropriate baseline screening and monitoring during exercise programs by appropriately trained and competent personnel (Parsons & King-VanVlack, 2009).

With literature showing the many benefits of exercise towards the health and well-being of end stage renal disease (ESRD) patients receiving maintenance hemodialysis, it is critical to uncover the availability and structure of exercise programs in dialysis facilities across Canada. In Germany, programs consisting of stretching, strengthening, and relaxation exercises have been implemented as standard clinical practice in dialysis facilities since 1995 (Cheema, Smith, & Singh, 2005). In 2005, supervised exercise programs were introduced in Australia for patients receiving hemodialysis treatments (Bennett, 2008). In the United Kingdom there are clinical intradialytic programs delivered by physiotherapists and physiotherapy assistants (S. Greenwood, Chair, British Renal Society Renal Rehabilitation Group, personal communication). However, there is currently no report that provides such information for Canada.

The overall study objective was to determine the availability and nature of exercise programs for patients receiving hemodialysis treatments across Canada. The survey was piloted first in Ontario since it had the most dialysis facilities per province as identified by the Canadian Institute for Health Information (CIHI). These programs deliver renal replacement therapy services to 42% of the prevalent ESRD patients in Canada (CIHI, 2010). This study sought to pilot an online survey tool in order to: a) determine the availability and characteristics of exercise programs offered by dialysis facilities in the province of Ontario, and b) to identify barriers to offering such exercise programs.

Methods

Study design

A cross-sectional descriptive study was conducted using an online survey tool. Our study was reviewed and approved by the Health Sciences Research Ethics Board at Queen's University (REH-505-11).

Participants

We invited every parent and satellite dialysis facility in Ontario to participate in this study. A dialysis facility is defined as a health care establishment with at least one hemodialysis sta-

Sunny Ma, MScPT, School of Rehabilitation Therapy, Queen's University, Kingston, ON

Jonathan Lui, MScPT, School of Rehabilitation Therapy, Queen's University, Kingston, ON, Canada

Dina Brooks, BScPT, PhD, Department of Physical Therapy, University of Toronto, Toronto, ON, Canada

Trisha L. Parsons, BScPT, PT, PhD, School of Rehabilitation Therapy, Queen's University, Kingston, ON, Canada

Address correspondence to: Trisha L. Parsons, BScPT, PT, PhD, 31 George Street, Kingston, ON K7L 3N6. Email: parsonst@queensu.ca

Submitted for publication: August 13, 2012.

Accepted for publication in revised form: October 12, 2012.

tion and provides on-site hemodialysis to patients with ESRD. The 2011 Directory of Participating Dialysis Centres in Canada (Section A of 2011 Canadian Organ Replacement Register [CORR]), as provided by the Canadian Institute for Health Information (CIHI), was used as part of our list of target survey respondents. However, CIHI confirmed that it was not mandatory for every dialysis facility to register with CORR. To address this issue, a section was included in the online survey where respondents were asked to identify other dialysis centres in their area. Any centre identified in this section of the survey not originally included in the 2011 CORR was subsequently added to the list of participants. Pediatric dialysis and French-language-only facilities were excluded from the list of participants.

Survey design

We chose FluidSurveys™ as the online survey host because it is a Canadian platform, entailing that all collected data through the survey tool will be stored in Canada according to the Canadian Privacy Act (FluidSurveys, 2010).

The proposed online survey was adapted from a previous study examining the availability of pulmonary rehabilitation programs for patients with chronic respiratory conditions across Canada (Brooks et al., 2007). The survey began with a consent form and a confidentiality statement on the first page. The rest of the survey consisted of twelve parts that were divided into two mutually exclusive sub-surveys. Part A to Part H were for dialysis centres that offered an exercise rehabilitation program, and included topics such as patient profile, the health care team, components of the exercise and dialysis program, outcome measures, and program follow-up. Part I to IV were for dialysis centres that did not offer an exercise rehabilitation program, and included topics such as perceived barriers to offering an exercise program, patient profile, the health care team, and components of the nephrology program.

Survey distribution

The survey was distributed via e-mail, which included an invitation letter and a link to the online survey. The e-mail was sent to the manager, nurse, medical director, or administrative staff listed

as the contact for each facility in the presented order of preference. However, the invitation letter stated that the survey could be forwarded to and completed by a person more familiar with the facility's dialysis program. Survey recipients who had not responded within three weeks after the initial invitation were prompted by a reminder email to complete the survey. Ninety-three facilities were identified from the CORR for the Ontario study, which took place in two phases. In Phase One, the surveys were randomly distributed to 30 dialysis facilities across Ontario, where the randomization was generated by a blinded investigator drawing facilities out of an envelope. The purpose of this phase was to pilot the survey with the actual respondents in order to confirm the efficacy of using an online survey distribution strategy, and to confirm the readability of the survey. In Phase Two, the surveys were distributed to the remaining dialysis facilities across Ontario.

Data analysis

Responses were returned electronically via FluidSurveys™ as each respondent completed and submitted the survey. If the respondent did not fully complete the survey, partial responses were still collected. The availability of exercise rehabilitation programs at dialysis facilities was determined by the ratio between the number of respondents who checked the field "Our facility offers an exercise rehabilitation program" on the second page of the survey and the total number of respondents.

The remaining survey responses included qualitative and quantitative data regarding the structure of an available exercise rehabilitation program, or the barriers contributing to the lack of such a program.

Results

Response rate

The distribution and collection of the surveys are depicted in Figure 1. Initially, 93 dialysis facilities were identified from the Canadian Organ Replacement Register (CORR) as our study population. However, two additional facilities not listed in the CORR were identified by a survey respondent during Phase Two, thus bringing the study population to 95 dialysis

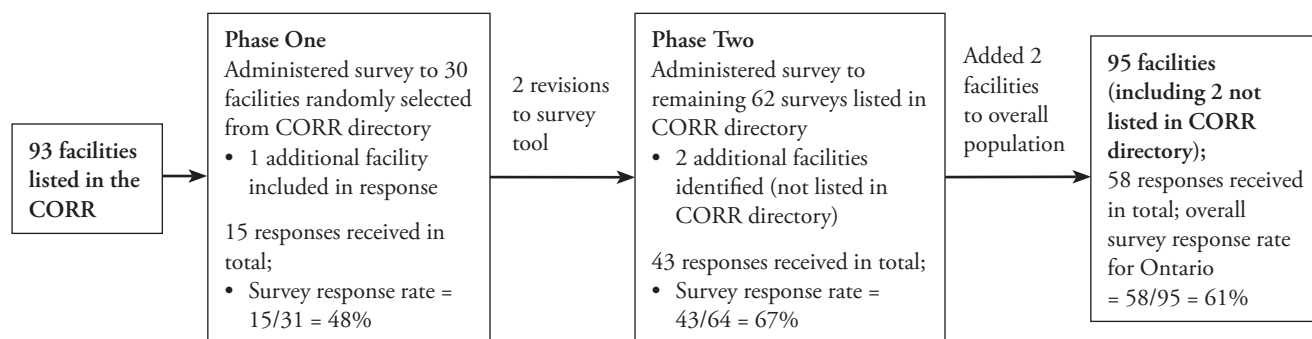


Figure 1: Schematic representation of survey distribution and response rates across Ontario. In Phase One, the online survey was administered to 30 randomly selected facilities from the CORR. One respondent in this sample provided survey responses for two facilities (i.e., one additional facility that was in the CORR) that were under the same management. Thus, one facility was removed from the Phase Two target sample and added to the Phase One sample. Two revisions were made to the survey prior to the initiation of Phase Two: 1) The option "nephrologist" was added to the list of health care professionals that could be selected by the respondents to indicate team composition, and 2) Respondents were asked about the number of dialysis stations available at each facility (per dialysis shift). In Phase Two, 62 surveys were distributed to the remaining facilities listed in the CORR. One respondent identified and provided responses for two additional facilities not listed in the CORR, changing the Phase Two sample to 64 facilities.

facilities. The survey response rate for Phase One was 48%, and the response rate for Phase Two was 67%, yielding an overall response rate of 61% (58 out of 95 dialysis facilities across Ontario).

Facilities offering exercise

The prevalence of exercise programs for patients receiving dialysis treatments in Ontario was 14%, which equates to eight facilities out of 58 responding dialysis facilities (Figure 2). Three of these exercise programs were research-related programs offered at three facilities in affiliation with a nearby university, where dialysis patients who consented to participate in the research protocol would receive exercise interventions during dialysis treatments. Conversely, four intradialytic exercise programs and two cardiac rehabilitation programs were offered clinically by five dialysis facilities, since a dialysis facility can offer more than one exercise program. For the research-related and clinical intradialytic exercise programs, the patients exercised during their routine hemodialysis treatments. The exercise regimens were highly variable and ranged from an unstructured program where the facility offered one bicycle to one patient for 30 minutes at a time, to a structured exercise program that varied from 30 to 45 minutes. Dialysis patients who were enrolled in the cardiac rehabilitation programs attended exercise sessions on non-dialysis days. The characteristics of the intradialytic and cardiac rehabilitation exercise programs are compared and contrasted in Table 1. The research-related and clinical intradialytic programs utilized similar parameters, except the clinical programs offered more types of exercises, and only the patients in the research-related programs and one intradialytic exercise program received graded exercise tests as part of the pre-exercise screening. Compared to the intradialytic exercise programs, the cardiac rehabilitation

exercise programs were longer in duration, more comprehensive with regard to pre-exercise screening, and had a more diverse referral source. Outcome measures that were used by the facilities to monitor patient progress at the start and end of exercise programs are listed in Table 2. The research-related exercise programs utilized the most comprehensive list of outcome measures, followed by the cardiac rehabilitation programs, then the clinical intradialytic exercise programs. The research-related intradialytic exercise program was the only group that used any outcome measures relating to quality of life.

Facilities not offering exercise

There were 50 dialysis facilities that indicated that they did not offer an exercise program to their dialysis patients (Figure 2). The 29 survey respondents who represented these facilities identified lack of funding ($n = 22$), lack of human resources ($n = 18$), and lack of equipment ($n = 17$) to be the most common barriers to offering exercise as part of the dialysis program (Figure 3). Other less commonly perceived barriers included lack of patient interest ($n = 7$), concerns regarding patient safety ($n = 4$), already having enough resources in the community ($n = 1$), absence of medical support ($n = 1$), lack of equipment storage space within the facility ($n = 1$), lack of demand ($n = 1$), and lack of knowledge regarding the delivery of an exercise program ($n = 1$).

Discussion

The survey responses from 58 of the 95 dialysis facilities surveyed across Ontario demonstrated the exceedingly low prevalence of exercise programs for dialysis patients in the province, the program parameters of the few existing programs, and barriers to offering such programs as identified by the remaining facilities who responded to the survey.

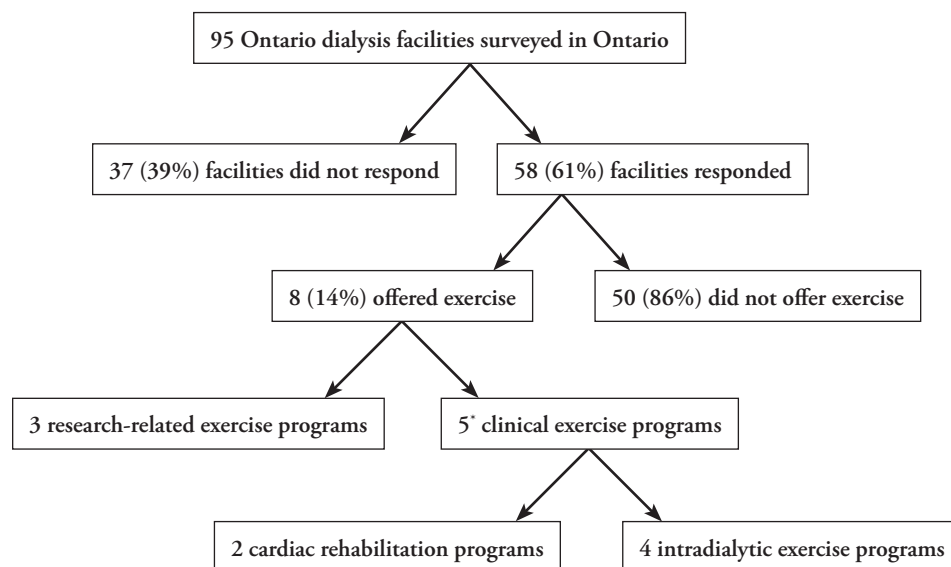


Figure 2: Prevalence of exercise programs across Ontario. Out of the 58 dialysis facilities that responded to the survey, 14% or eight facilities offered some form of exercise. Three facilities offered intradialytic exercise as part of research protocols in affiliation with a nearby university, and five facilities offered intradialytic exercise and/or cardiac rehabilitation sessions to their patients as part of the regular dialysis program. Note that a dialysis facility can offer more than one exercise program. The remaining 50 responding facilities did not offer an exercise program.

*One facility offered both cardiac rehabilitation and intradialytic exercise programs.

Table 1: Characteristics of the research-related intradialytic exercise programs, clinical intradialytic exercise programs, and cardiac rehabilitation exercise programs

	Research-related intradialytic exercise programs (3 facilities)	Clinical intradialytic exercise programs (4 facilities)	Cardiac rehabilitation programs (2 facilities)
Number of patients enrolled	Up to 20 patients	1–25 patients	1–12 patients
Length of programs	Up to 12 weeks	On-going	6–12 weeks
Frequency	3 times per week	2–3 times per week	2 times per week
Time	Up to 30 minutes	Up to 30–45 minutes	1–1.5 hours/class
Type	Aerobic	Aerobic, resistance, flexibility	Aerobic, resistance
Referral to exercise program	By nephrologists, registered nurse, or physiotherapist	By nephrologists, advanced practice nurse (n=1), or patient self-referral (n=1)	By nephrologists, hospital cardiac program, diabetes program, or chronic kidney disease program
Pre-exercise screening	Physician approval, graded exercise test	Physician approval (n=3), graded exercise test (n=1), PAR-Q questionnaire (n=1)	Physician approval, graded exercise test, PAR-Q questionnaire
Supervision during exercise	Registered nurse, physiotherapist, exercise physiologist	Registered nurse, physiotherapist (n=2)	Registered nurse, physiotherapist
Monitoring patient status during exercise	<ul style="list-style-type: none"> Heart rate Blood pressure Perceived exertion Symptoms (shortness of breath, chest pain) 	<ul style="list-style-type: none"> Heart rate Blood pressure Perceived exertion Symptoms (shortness of breath, chest pain) 	<ul style="list-style-type: none"> Heart rate Blood pressure Perceived exertion Symptoms (shortness of breath, chest pain)
Re-enrolment allowed	Yes, strong patient interest	Yes	Yes, but only if patient experiences another cardiac event
Waiting list for re-enrolment	Yes, until next study becomes available	No	No (n=1), Yes, 3 weeks (n=1)

Table 2: Outcome measures used in research-related intradialytic exercise programs, clinical intradialytic exercise programs, and cardiac rehabilitation exercise programs as listed by category

	Research-related intradialytic exercise programs (3 facilities)	Clinical intradialytic exercise programs (4 facilities)	Cardiac rehabilitation programs (2 facilities)
Outcome measures	<p><i>Body composition</i> Weight (kg)</p> <p><i>Functional measures</i> Six-Minute Walk Test Incremental Shuttle Walk Test Sit-to-Stand Test Timed Up and Go Test</p> <p><i>Cardiovascular measures</i> Resting blood pressure Arterial stiffness Ankle-brachial index</p> <p><i>Health-related quality of life measures</i> Short Form-36 (SF-36) Kidney Disease Quality of Life Questionnaire-36 (KDQOL-36)</p>	<p><i>Body composition</i> Weight (kg)</p> <p><i>Functional measures</i> Six-Minute Walk Test Sit-to-Stand Test</p> <p><i>Balance/fall risk</i> Berg Balance Scale</p>	<p><i>Body composition</i> Weight (kg)</p> <p><i>Functional measures</i> Six-Minute Walk Test</p> <p><i>Balance/fall risk</i> Berg Balance Scale</p> <p><i>Cardiovascular measures</i> Resting blood pressure</p> <p><i>Cardiorespiratory function</i>— exercise testing Sub-maximal VO₂ test using a treadmill</p>

Our survey yielded a response rate of 61%, which is high compared to response rates seen in literature across the psychology, commerce, and information technology disciplines (Lonsdale, Hodge, & Rose, 2006; Munoz-Leiva, Sanchez-Fernandez, Montoro-Rios, & Ibanez-Zapata, 2009; Wright & Schwager, 2008). Our study is the first to report the prevalence of exercise programs for dialysis patients across Ontario. Despite the abundance of literature on the effect of exercise and chronic kidney disease, no one has reported on the prevalence of such exercise programs in Canada. In Texas, a cross-sectional survey study was conducted across 169 dialysis facilities in the ESRD Network of Texas (Curtin, Klag, Bultman, & Schatell, 2002). Using a tool developed by the investigators, the number of rehabilitation activities in each of five areas (encouragement, education, exercise, employment, and evaluation) was determined. The result of this study also found that exercise was the least implemented category amongst the “5Es” of renal rehabilitation, as identified by the Life Options Rehabilitation Program (Life Options Rehabilitation Advisory Council, 1998). Of the 151 Texas dialysis facilities that offered at least one form of rehabilitation activity to their patients, the average number of exercise activities carried out was 3.71 ± 2.94 out of a possible 20 exercise activities; only 21% of facilities reported carrying out an advanced exercise rehabilitation activity (e.g., in-centre exercise program). In comparison, our results demonstrate an even lower prevalence of in-centre exercise programs for persons receiving hemodialysis treatment in the province of Ontario. Although eight dialysis facilities from this study offered some form of exercise to their patients, the true prevalence of clinical exercise programs is lower because three of the facilities offered exercise that was only research-related, meaning patients only received exercise intervention periodically during research protocols, and the exercise was not integrated clinically, as part of the patients’ program of care. This left only five facilities where patients were receiving exercise clinically, as an adjunct treatment to their regular dialysis program of care.

Although the prevalence of programs is low, those in existence appear to be delivered in a manner consistent with best practice evidence. The clinical intradialytic exercise programs adopted exercise time and frequency parameters (i.e., 30–45 minutes and two to three times per week, respectively) that have been demonstrated to be effective, where results included benefits such as reduced symptoms associated with restless leg syndrome, decreased anemic symptoms, improved quality of life, and decreased need for blood pressure medication (Miller, Cress, Johnson, Nichols, & Schnitzler, 2002; Reboredo et al., 2010; Sakkas et al., 2008; Wilund et al., 2010). Of the two facilities that offered cardiac rehabilitation, the parameters that were practised resembled what the Cochrane Review listed as the most effective

regimen for chronic kidney disease (CKD) patients to increase aerobic capacity, which included four to six months of regular (three sessions per week) and supervised high-intensity sessions lasting 30 to 90 minutes, ideally mixing both cardiovascular and resistance training (Heiwe & Jacobson, 2011). The outcome measures used by the facilities to monitor the efficacy of their exercise programs are consistent with those used in published literature for the ESRD population: six-minute walk test (Parsons et al., 2006), sit-to-stand test (Segura-Ortí & Martinez-Olmos, 2011), timed up and go test (Nonoyama et al., 2010), and the incremental shuttle walk test (Wilund et al., 2010). Although the outcome measures used primarily capture physical functioning, programs should also use appropriate measures to capture the patients’ self-perceived quality of life (Finkelstein, Wuerth, Troidle, & Finkelstein, 2008).

Despite evidence that suggests exercise can provide a myriad of benefits, the prevalence of exercise programs is low across Ontario due to barriers such as lack of funding, lack of human resources, and lack of equipment. Perceived barriers regarding patient safety also remain. These barriers were also mentioned in a descriptive study by Kutner and colleagues (2010), who suggested that reasons why health care providers do not address physical activity in dialysis patients included fear for patient safety and lack of expertise. A central question persists: Are these programs safe? This is not a simple question to answer—its answer would have to come from a long-term, prospective trial of an adequate number of participants who were representative of the average clinical dialysis population or a large observational cohort study. Ultimately, the current evidence shows that intradialytic exercise appears safe in adequately screened participants (Cheema et al., 2005).

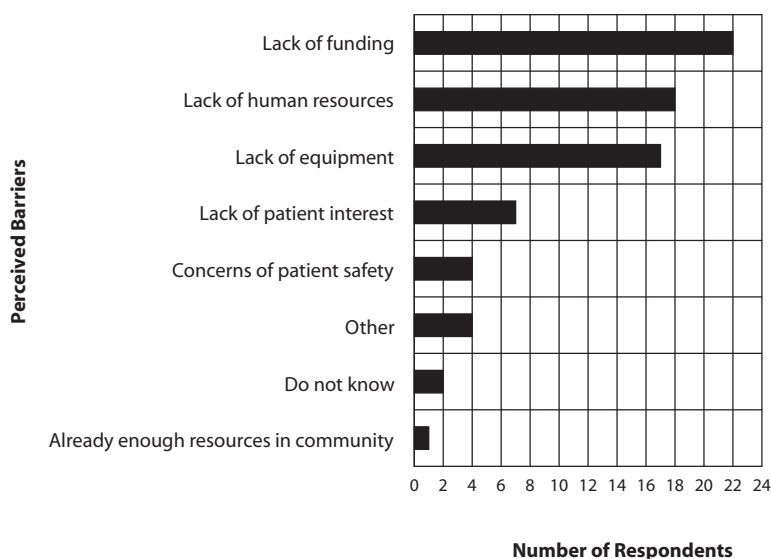


Figure 3: Barriers perceived by survey respondents ($n = 29$) of dialysis facilities that did not offer exercise programs. The total number of respondents who answered this question in the survey is 29. Note that each respondent can identify more than one barrier. The “Others” barriers include absence of medical support ($n = 1$), lack of space to store equipment ($n = 1$), lack of demand ($n = 1$), and lack of knowledge ($n = 1$).

A better clinical question would be, “Do the benefits of exercise outweigh the risks?” The answer to this question is individualized and can be broken down into many sub-questions. There are risks associated with a given patient remaining sedentary. The lack of physical activity is one of the leading causes of preventable death (Lopez et al., 2006). Furthermore, low physical fitness is an independent predictor of cardiovascular death in the general population (Kodama et al., 2009). Conversely, hemodialysis patients who engage in regular physical exercise have been observed to enjoy improved health outcomes and survival, as compared to their less-active counterparts (Tentori et al., 2010). However, there are also risks associated with exercising, which include musculoskeletal injury or an acute cardiovascular event induced by exercise (American College of Sports Medicine, 2010). These risks are, in part, dependent on the health of the individual and the intensity of exercise they seek to perform (American College of Sports Medicine, 2010). This is the nature of the risk stratification that forms the baseline screening for inclusion in an exercise program. Risk stratification is predicated on a baseline evaluation of the persons’ health status and an understanding of the intensity of exercise that will be performed, and involves a clinical decision regarding the relative risks and benefits of performing the intervention. For example, even a patient deemed to be at high risk for an acute cardiovascular event could still be encouraged to engage in relatively low-intensity exercise without the need for a formal exercise test (ACSM, 2010). In this case, the risk of inactivity is greater than the risk induced by the physical exertion. To put this risk into perspective, Scheinowitz et al. (2005) reported a cardiovascular event rate of 1/58,902 patient-hours/year (0.02%) in a medically supervised community-based cardiac rehabilitation program. While not specific to a dialysis population, patients from this cohort included individuals with history of myocardial infarction, revascularization procedures, and/or at risk for a cardiovascular event.

Are there additional risks to exercising during dialysis? The answer here is also “yes”. There are risks that lines could become pulled out, or a patient could experience muscle cramping, a hypotensive episode, or a cardiac arrhythmia during their treatment. Currently, there is no published evidence to show “causation” for these phenomena with respect to intradialytic exercise; that is, there is no published research that shows exercise induces muscle cramps, hypotensive episodes, or cardiac arrhythmias during hemodialysis, nor that the risk of experiencing them is greater with exercise during dialysis. There is a need for further research in this area to re-enforce the observation from current clinical trials that intradialytic exercise is safe in adequately screened and monitored patients (Cheema et al., 2005; Parsons et al., 2009). The issue of causation notwithstanding, patients who are prone to these phenomena may still experience these issues during any given exercise session. Patients who experience these issues may be better advised to engage in exercise off-dialysis or may require additional monitoring or coaching to promote adherence. Having an appropriate health care team member who can contribute to the assessment, risk-stratification, monitoring, and coaching of hemodialysis patients can contribute to the health care team and, ultimately, facilitate the delivery of safe exercise programs.

Facilities facing difficulties in delivering exercise programs is not a new occurrence. With lack of funding as the most identi-

fied barrier in Ontario, it is not surprising that lack of human resources and lack of equipment are the second and third most identified barriers respectively. A solution to providing exercise or knowledge regarding exercise to dialysis patients is to introduce a health care team member with an expertise in physical function and exercise who can deliver and supervise the exercise programs, as well as properly educate the patients regarding exercise and physical activity. According to a systematic review that summarized the key elements of a sustainable hemodialysis exercise program, having an exercise expert on the team not only allows for safe and individually prescribed exercise programs, it also diverts pressure away from other health care professionals such as nurses, whose client-centred work priority is not exercise (Bennett et al., 2010). Physiotherapists are prime candidates for this role, as it is in the Ontario physiotherapists’ scope of practice to assess, treat, and prevent physical problems in order to restore movement, function, and health status (College of Physiotherapists of Ontario, 2011). In reviewing the health care team composition of dialysis facilities that offered exercise programs, all eight of the facilities offering exercise included a physiotherapist on their health care team; none of the remaining facilities without exercise programs identified having a physiotherapist or other exercise specialist as part of their team. The inclusion of such an exercise expert on the team to support the delivery of programs is key to the successful establishment of a safe, evidence-informed, and sustainable exercise intervention for dialysis patients. Work is currently underway to extend these findings in an effort to characterize programs across Canada.

Conclusion

This study is the first to report on the prevalence of exercise programs in Ontario for patients with end stage renal disease who are receiving hemodialysis treatments. Using an online survey, which yielded a 61% response rate from dialysis facilities across Ontario, results showed that only eight facilities offered intradialytic and/or cardiac rehabilitation exercise programs. Of these eight, three were delivered as part of a program of research, and not as a funded clinical program. The remaining 50 facilities reported lack of funding, lack of equipment, and lack of human resources to be the most common barriers to offering such programs. Introducing a physiotherapist to the dialysis team to act as a resource and to prescribe individualized exercise programs may be key to offering more exercise options to hemodialysis patients. Work is currently underway to administer the online survey tool to dialysis programs across Canada.

Acknowledgements

We would like to acknowledge the editors of the Canadian Organ Replacement Register (CORR) at the Canadian Institute for Health Information (CIHI) for assisting us with identifying our study participants. Dr. Dina Brooks holds a Canada Research Chair. Dr. Trisha Parsons is leading the establishment of the Canadian Renal Rehabilitation Network (CRRN), a Canadian Institutes of Health Research initiative (Institute of Nutrition, Metabolism, and Diabetes), which joins inter-professional clinicians (nurses, physiotherapists, nephrologists, kinesiologists), researchers, decision-makers, and persons living with chronic kidney disease from across Canada, the United States and the United Kingdom to facilitate the delivery of patient-engaged, evidence-informed, and sustainable renal rehabilitation services to Canadians living with Chronic Kidney Disease.

References

- Afshar, R., Emany, A., Saremi, A., Shavandi, N., & Sanavi, S. (2011). Effects of intradialytic aerobic training on sleep quality in hemodialysis patients. *Iranian Journal of Kidney Diseases*, 5(2), 119–123.
- American College of Sports Medicine. (2010). *ACSM's guidelines for exercise testing and prescription* (8th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.
- Bennett, P. (2008). World leading exercise program for renal dialysis patients. *Australian Nursing Journal*, 16(1), 29–30.
- Bennett, P.N., Breugelmans, L., Barnard, R., Agius, M., Chan, D., Fraser, D., McNeill, L., & Potter, L. (2010). Sustaining a hemodialysis exercise program: A review. *Seminars in Dialysis*, 23(1), 62–73.
- Brooks, D., Scottana, R., Bell, B., Hanna, M., Laframboise, L., Selvanayagarajah, S., & Goldstein, R. (2007). Characterization of pulmonary rehabilitation programs in Canada in 2005. *Canadian Respiratory Journal*, 14(2), 87–92.
- Canadian Institute for Health Information. (2010). *Final Treatment Modality for End-Stage Renal Disease (ESRD) Patients on Dec 31* (Interactive data, Report ID: PROC13). Retrieved from <http://www.cihi.ca/CIHI-ext-portal/internet/EN/Home/home/cihi000001>
- Cheema, B.S., Smith, B.C., & Singh, M.A. (2005). A rationale for intradialytic exercise training as standard clinical practice in ESRD. *American Journal of Kidney Diseases*, 45(5), 912–916.
- College of Physiotherapists of Ontario. (2011). *Physiotherapy scope of practice changes—Frequently asked questions*. Retrieved from www.collegept.org/Home
- Curtin, R.B., Klag, M.J., Bultman, D.C., & Schatell, D. (2002). Renal rehabilitation and improved patient outcomes in Texas dialysis facilities. *American Journal of Kidney Disease*, 40(2), 331–338.
- Data privacy in Canada [Internet]. [updated 2010; cited 2011 Nov 28]. Available from <http://fluidsurveys.com/canada/data-privacy-canada/>
- Finkelstein, F.O., Wuerth, D., Troidle, L.K., & Finkelstein, S.H. (2008). Depression and end-stage renal disease: A therapeutic challenge. *Kidney International*, 74, 843–845.
- FluidSurveys. (2010) *Data privacy in Canada*. Retrieved from <http://fluidsurveys.com/canada/data-privacy-canada/>
- Heiwe, S., & Jacobson, S.H. (2011). Exercise training for adults with chronic kidney disease. *Cochrane Database of Systematic Reviews*, (10), CD003236.
- Kodama, S., Saito, K., Tanaka, S., Maki, M., Yachi, Y., Asumi, M., Sugawara, A., ... Sone, H. (2009). Cardiorespiratory fitness as a quantitative predictor of all-cause mortality and cardiovascular events in healthy men and women: A meta-analysis. *Journal of the American Medical Association*, 301(19), 2024–2035.
- Kolewaski, C.D., Mullally, M.C., Parsons, T.L., Paterson, M.L., Toffelmire, E.B., & King-VanVlack, C.E. (2005). Quality of life and exercise rehabilitation in end stage renal disease. *Canadian Association of Nephrology Nurses and Technologists Journal*, 15(4), 22–29.
- Kong, C.H., Tattersall, J.E., Greenwood, R.N., & Farrington, K. (1999). The effect of exercise during haemodialysis on solute removal. *Nephrology Dialysis Transplantation*, 14(12), 2927–2931.
- Kutner, N.G. (2010). Rehabilitation in the renal population: Barriers to access. *Seminars in Nephrology*, 30(1), 59–65.
- Life Options Rehabilitation Advisory Council. (1998). *Unit self-assessment manual for renal rehabilitation: A guide to the use and interpretation of the Life Options unit self-assessment tool for renal rehabilitation*. Madison, WI: Medical Media Associates Inc.
- Lonsdale, C., Hodge, K., & Rose, E.A. (2006). Pixel vs. paper: Comparing online and traditional survey methods in sports psychology. *Journal of Sports & Exercise Psychology*, 28, 100–108.
- Lopez, A.D., Mathers, C.D., Ezzati, M., Jamison, D.T., & Murray, C.J. (2006). Global and regional burden of disease and risk factors, 2001: Systematic analysis of population health data. *Lancet*, 367(9524), 1747–1757.
- Miller, B.W., Cress, C.L., Johnson, M.E., Nichols, D.H., & Schnitzler, M.A. (2002). Exercise during hemodialysis decreases the use of antihypertensive medications. *American Journal of Kidney Disease*, 39(4), 828–833.
- Munoz-Leiva, F., Sanchez-Fernandez, J., Montoro-Rios, F., & Ibanez-Zapata, J.A. (2009). Improving the response rate and quality of web-based survey through the personalization and frequency of reminder mailings. *Quality & Quantity*, 44, 1037–1052.
- Nonoyama, M.L., Brooks, D., Ponikvar, A., Jassal, S.V., Kontos, P., Devins, G.M., Spanjevic, L., Heck, C., Laprade, J., & Naglie, G. (2010). Exercise program to enhance physical performance and quality of life of older hemodialysis patients: A feasibility study. *International Urology & Nephrology*, 42, 1125–1130.
- Parsons T.L. & King-VanVlack C.E. (2009). Exercise and end-stage kidney disease: Functional exercise capacity and cardiovascular outcomes. *Advances in Chronic Kidney Disease*, 16(6), 459–81.
- Parsons, T.L., Toffelmire, E., & King-VanVlack, C. (2006). Exercise training during hemodialysis improves dialysis efficacy and physical performance. *Archives of Physical Medicine and Rehabilitation*, 87(5), 680–687.
- Reboredo, M., Henrique, D.M., Faria, S., Chaoubah, A., Bastos, M.G., & de Paula, R.B. (2010). Exercise training during hemodialysis reduces blood pressure and increases physical functioning and quality of life. *Artificial Organs*, 34(7), 586–593.
- Sakkas, G.K., Hadjigeorgiou, G.M., Karatzaferi, C., Maridaki, M.D., Giannaki, C. D., Mertens, P. R., Rountas, C., ... Stefanidis, I. (2008). Intradialytic aerobic exercise training ameliorates symptoms of restless legs syndrome and improves functional capacity in patients on hemodialysis: A pilot study. *American Society of Artificial Internal Organs Journal*, 54(2), 185–190.
- Scheinowitz, M., & Harpaz, D. (2005). Safety of cardiac rehabilitation in a medically supervised, community-based program. *Cardiology*, 103, 113–117.
- Segura-Ortí, E., & Johansen, K.L. (2010). Exercise in end-stage renal disease. *Seminars in Dialysis*, 23(4), 422–30.
- Segura-Ortí, E., & Martínez-Olmos, F.J. (2011). Test-retest reliability and minimal detectable change scores for sit-to-stand-to-sit test, the six-minute walk test, the one-leg heel-rise test, and handgrip strength in people undergoing hemodialysis. *Physical Therapy*, 91(8), 1244–1252.
- Tentori, F., Elder, S.J., Thumma, J., Pisoni, R.L., Bommer, J., Fissel, R.B., Fukuhara, S., ... Robinson, B.M. (2010). Physical exercise among participants in the Dialysis Outcomes and Practice Patterns Study (DOPPS): correlates and associated outcomes. *Nephrology Dialysis Transplantation* 25(9), 3050–3062.
- Wilund, K.R., Tomayko, E.J., Wu, P.T., Ryong Chung, H., Vallurupalli, S., Lakshminarayanan, B., & Fernhall, B. (2010). Intradialytic exercise training reduces oxidative stress and epicardial fat: A pilot study. *Nephrology Dialysis Transplantation*, 25(8), 2695–2701.
- Wright, B., & Schwager, P.H. (2008). Online survey search: Can response factors be improved? *Journal of Internet Commerce*, 7(2), 253–269.

New agent to treat elevated phosphate levels: Magnesium carbonate/calcium carbonate tablets

By Caitlin Meyer, Karen Cameron, BScPhm, ACPR, CGP, and Marisa Battistella, BScPhm, PharmD, ACPR

Copyright © 2012 Canadian Association of Nephrology Nurses and Technologists

Introduction

Hyperphosphatemia is a persistent issue in patients with chronic kidney disease (CKD) due to decreased renal elimination of phosphate. Hyperphosphatemia is accompanied by hypocalcemia and low levels of vitamin D, and often leads to secondary hyperparathyroidism. Mainstay treatment involves strict dietary restriction of phosphorus. However, this is usually not sufficient and pharmacological intervention with phosphate binders is required (Tonelli, Pannu, & Manns, 2010).

Pathophysiology

In individuals without CKD, serum phosphate levels are maintained through dietary absorption, bone formation and resorption and renal excretion (Tonelli, Pannu, & Manns, 2010). Parathyroid hormone (PTH) decreases the reabsorption of phosphorus in the proximal tubule, allowing for increased excretion in the distal tubule in healthy individuals (Tomasello, 2007). However, once the glomerular filtration rate drops below 30 mL/min per 1.73 m² of body-surface area, the body's natural compensatory mechanisms are impaired and phosphate levels rise considerably (Tonelli, Pannu, & Manns, 2010). In individuals with stage 4 or 5 kidney disease, dietary intake of phosphorus outweighs renal excretion and hyperphosphatemia inevitably occurs (Tomasello, 2007).

The activation of vitamin D is inhibited, as the activity of 1 α -hydroxylase in the kidney is diminished by increases in phosphorous levels. The deficiency in vitamin D also impacts the intestinal absorption of calcium, resulting in lower serum concentrations of calcium. Ultimately, the production and secretion of parathyroid hormone is increased, resulting in bone breakdown and calcium release (Tomasello, 2007).

Phosphate control has become an emerging concern due to large observational studies that have demonstrated the link between elevated phosphate levels and all-cause mortality in patients requiring dialysis (Block, Hulbert-Shearon, Levin, & Port, 1998). Although there are several plausible mechanisms that link elevated serum phosphate levels to increased cardiovascular events and mortality, the most likely explanation is due to vascular calcification (Giachelli, 2009).

Pharmacological intervention

In an effort to lower phosphate levels, phosphate binders are utilized. They bind to phosphate, creating a precipitant that cannot be absorbed into the bloodstream and is readily eliminated in the feces (Noris, 2001). The ideal phosphate binder would bind to dietary phosphate, have minimal side effects, be inexpensive, and have a low pill burden and minimal systemic absorption (Tonelli, Pannu, & Manns, 2010). Unfortunately, the ideal phosphate binder does not currently exist.

There are multiple pharmacological options available for use as phosphate binders. Many studies assessing the efficacy and safety of these agents are available (Suki et al., 2007; Tonelli et al., 2007; St. Peter, Liu, Weinhandle, & Fan, 2008; Chertow, Burke, & Raggi, 2002; Almirall et al., 2004; Hutchinson et al., 2005; Shigematsu, 2008; Pflanz, Henderson, McElduff, & Jones, 1994.). Originally, aluminum-containing agents were used, but due to the potential of systemic aluminum toxicity these agents were largely abandoned. Historically, magnesium-containing phosphate binders have not been used due to concerns over hypermagnesemia. Calcium-containing binders are effective and inexpensive, but result in high pill burden and gastrointestinal side effects. Newer agents, such as lanthanum and sevelamer do not contain calcium, but are expensive and also cause gastrointestinal side effects (Tonelli, Pannu, & Manns, 2010). A new magnesium-containing phosphate binder is currently being marketed—Binaphos CM®.

Caitlin Meyer, 4th Year Pharmacy Student, University of Waterloo, Waterloo, ON

Karen Cameron, BScPhm, ACPR, CGP, Education Coordinator, University Health Network, Toronto, ON

Marisa Battistella, BSc Phm, PharmD, ACPR, Clinician Scientist, Assistant Professor, Leslie Dan Faculty of Pharmacy, University of Toronto, Clinical Pharmacist—Nephrology, University Health Network

Address correspondence to: Marisa Battistella, BSc Phm, PharmD, ACPR, Clinical Pharmacist—Nephrology, University Health Network, 200 Elizabeth Street, EB 214, Toronto, ON, M5G 2C4

Email: marisa.battistella@uhn.ca

Binaphos CM®

Binaphos CM® contains two phosphate binding elements—magnesium carbonate 291 mg (80 mg elemental magnesium) and calcium carbonate 340 mg (120 mg elemental calcium). (Seaford Pharmaceutical Inc.).

Comparative studies on Binaphos CM® in the literature are lacking, however, three relevant studies are reviewed and summarized below.

Literature review

The efficacy of a magnesium carbonate/calcium carbonate combination tablet, as a phosphate binder, was studied in a prospective, randomized, open-label trial in 30 hemodialysis patients over a three-month period. Inclusion criteria included: age greater than 18 years, on chronic hemodialysis for at least three months, use of a phosphate binder before entry into the study with an average serum calcium between 2.0 mmol/L and 2.54 mmol/L, and an average serum phosphate between 0.97 mmol/L and 2.23 mmol/L (Spiegel, Farmer, Smits, & Chonchol, 2007).

Patients were randomized in a 2:1 fashion to receive either a magnesium carbonate/calcium carbonate combination or calcium acetate after a one- to two-week washout phase. The 20 patients in the combination arm received 100 mg of elemental calcium and 86 mg of elemental magnesium, whereas the ten patients in the calcium acetate arm received their calcium dose pre-washout phase or an equivalent dose (depending on their previous phosphate binder: 1:1 sevelamer or 2:3 calcium carbonate). The dose of each agent was maintained to achieve a KDOQI phosphate target of <1.78 mmol/L. Both treatment options provided equivalent control of serum phosphorus within the KDOQI guidelines (70.6% combination vs. 62.5% calcium acetate; *p* value = ns). As expected, serum magnesium levels were significantly higher in the combination arm with a mean serum level of 1.2 mmol/L (standard error mean, 1.1–1.3 mmol/L) compared to the calcium acetate arm with a mean serum level of 0.93 mmol/L (standard error mean, 0.90–0.98 mmol/L). Three patients withdrew in the combination arm and one patient in the calcium acetate arm due to gastrointestinal side effects. One patient in the calcium acetate group was hospitalized and later returned to a rehabilitation facility. Therefore, the results are based on 25 patients (Spiegel et al., 2007).

The efficacy and safety of magnesium carbonate alone, as a phosphate binder, was examined in a randomized controlled trial in 46 hemodialysis patients. Secondary outcomes included changes in serum calcium, serum magnesium, bowel movements, calcium \times phosphate product ($\text{Ca} \times \text{P}$) and PTH levels. Exclusion criteria included patients under the age of 18, hemodialysis for less than six months, psychiatric or other disorders leading to compliance issues, unlikely to continue dialysis for more than six months in the same facility, critical illness or parathyroidectomy, severe hyperparathyroidism ($\text{iPTH} > 50 \text{ pmol/L}$), normal serum phosphate (<1.78 mmol/L) without phosphate binders, disease resulting in diarrhea and lack of consent (Tzanakis et al., 2008).

Patients were randomized to receive either calcium carbonate (*n*=21) or magnesium carbonate (*n*=25) for a total of six months. Both phosphate binders were initiated at three tablets daily and then adjusted according to serum phosphate

levels (<1.78 mmol/L). Magnesium carbonate tablets contained 71 mg of elemental magnesium and calcium carbonate tablets contained 168 mg of elemental calcium. Magnesium concentration in the dialysate was adjusted appropriately for those in the magnesium carbonate arm. Results from the study showed non-significant differences in the levels of phosphate, $\text{Ca} \times \text{P}$, magnesium and PTH at six months. Both groups had serum phosphate and PTH levels that fell within the accepted KDOQI guidelines. There was a significant difference between calcium levels, with those individuals in the calcium carbonate arm falling within the KDOQI guidelines less often due to hypercalcemia (MgCO_3 73.9% versus CaCO_3 25%, *p*<0.01). Two patients in the magnesium carbonate arm dropped out of the study due to adverse side effects (diarrhea and hypermagnesemia) (Tzanakis et al., 2008).

Parsons et al. (1993) examined the use of a combination of calcium and magnesium carbonate as a phosphate binder in patients on continuous ambulatory peritoneal dialysis (CAPD) for a one-year period. Thirty-two patients were given the magnesium carbonate (2.2 g)/calcium carbonate (2.2 g) combination, 10 patients received calcium carbonate alone due to a negative history with magnesium phosphate binders and eight patients used aluminum hydroxide as their phosphate binder. Patients were initiated on phosphate binders if they had three occasions where phosphorous levels exceeded 2.0 mmol/L, were outpatients and had no complications that would likely lead to a change in therapy. The doses were adjusted to maintain a phosphate concentration below 2.0 mmol/L (Parsons et al., 1993).

When comparing the magnesium carbonate/calcium carbonate combination against calcium carbonate alone after one year, changes in serum calcium (2.41 ± 0.15 vs 2.43 ± 0.19 mmol/L), phosphate (1.36 ± 0.41 vs 1.38 ± 0.27 mmol/L), magnesium (0.97 ± 0.21 vs 0.96 ± 0.26 mmol/L) and PTH (121 ± 146 vs 141 ± 188 pmol/L) were non significant. One patient required a parathyroidectomy secondary to elevated PTH, persistent hypocalcaemia, elevated alkaline phosphatase and bone changes. It is unclear why adequate control of hyperparathyroidism is mentioned, as phosphate binders manage hyperphosphatemia.

Limitations in the literature

All three studies had significant limitations. They consisted of non-blinded, single-centre studies, small sample sizes and were short in duration. Due to the lack of follow-up there is insufficient long-term data on safety and efficacy with this phosphate binder.

In the study performed by Spiegel et al. (2007), patients were eliminated if they had a history of diarrhea and, so, in this patient population, it is uncertain if this medication would worsen diarrhea, thus impacting medication compliance. In the study by Tzanakis et al. (2008), the patients enrolled had low phosphate levels and the majority of patients did not use vitamin D supplementation. This is not consistent with the general hemodialysis population and, therefore, affects the external validity of the study.

Although not a prevalent adverse effect reported, hypermagnesemia is a serious concern and one of the main reasons magnesium-containing phosphate binders are not currently used in practice. It is unclear how magnesium levels were monitored in

all three studies. Hypermagnesemia at levels >1.5 mmol/L presents as nausea, vomiting, skin flushing, weakness and lightheadedness. At higher levels, it is associated with loss of consciousness, respiratory depression and cardiac arrest. Magnesium levels should be monitored and, if elevated, the magnesium-containing phosphate binder should be stopped (Smilkstein, Smolinske, Kulig, & Rumack, 1988).

Dosing and administration

Binaphos CM® is taken with meals and snacks. The dose can range from one to multiple tablets at each meal or snack depending on the phosphorus content. Additional phosphate binders are discontinued upon starting Binaphos CM®. Binaphos CM® is sold for roughly 12¢ per tablet or \$12/bottle. It is sold in bottles of 100 tablets (Seaford Pharmaceuticals Inc.).

Adverse events

The side effects of Binaphos CM® are similar to calcium-containing phosphate binders and include constipation, diarrhea, upset stomach and, in rare instances, hypermagnesemia (Lexicomp, 2012). Hypermagnesemia, although uncommon,

must be monitored due to the potential for severity. Iron supplements need to be taken one to two hours before or after taking Binaphos CM® to improve iron absorption (Lexicomp, 2012).

Summary

In summary, Binaphos CM®, a magnesium carbonate/calcium carbonate combination phosphate binder, is marketed for treating elevated phosphate levels in dialysis patients. Although studies using magnesium/calcium carbonate as a phosphate binder are short term with small numbers of patients, this phosphate binder has shown some promising results and may provide clinicians with an alternative for phosphate binding. Using a combination phosphate binder may reduce pill burden and encourage patient compliance. In addition to calcium and phosphate, it is imperative to diligently monitor magnesium levels in patients started on this medication, as magnesium levels may increase with longer duration of use. Additional randomized controlled trials are necessary to evaluate long-term efficacy and safety of this combination phosphate binder.

References

- AHFS consumer medication information. *Calcium Carbonate*. PubMed Health (2010). Accessed from <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0000035/>
- Almirall, J., Lopez, T., Vallve, M., Ruiz, A., Llibre, J., & Betriu, A. (2004). Safety and efficacy of sevelamer in the treatment of uncontrolled hyperphosphatemia of haemodialysis patients. *Nephron Clin Pract*, 97, c17–c22.
- Block, G., Hulbert-Shearon, T., Levin, N., & Port, F. (1998). Association of serum phosphorus and calcium x phosphate product with mortality risk in chronic hemodialysis patients: A national study. *Am J Kidney Dis*, 31, 607–17.
- Chertow, G.M., Burke, S.K., & Raggi, P. (2002). Sevelamer attenuates the progression of coronary and aortic calcification in hemodialysis patients. *Kidney Int*, 62, 245–52.
- Covic, A. (2010). Magnesium in chronic kidney disease—more than just phosphate binding. *Phosphorous Control—European Nephrology*, 28–36.
- Giachelli, C.M. (2009). The emerging role of phosphate in vascular calcification. *Kidney Int*, 75, 890–7.
- Hutchinson, A.J., Maes, B., Vanwalleghem, J., Asmus, G., Mohamed, E., Schmieder, R., Backs, W., ... Vosskuhler, A. (2005). Efficacy, tolerability and safety of lanthanum carbonate in hyperphosphatemia: a 6-month, randomized, comparative trial versus calcium carbonate. *Nephron Clin Pract*, c8–c19.
- Lexicomp Online. (2012.) *Magnesium carbonate, calcium carbonate and folic acid*. Retrieved from <http://online.lexi.com/crlsql/servlet/crlonline>
- Noris, K. (2001). Phosphate binders: What are they and how do they work? *AAKP RENALIFE*, 16, 5.
- Parsons, V., Baldwin, D., Moniz, C., Marsden, J., Ball, E., & Rifkin, I. (1993). Successful control of hyperparathyroidism in patients on continuous ambulatory peritoneal dialysis using magnesium carbonate and calcium carbonate as phosphate binders. *Nephron*, 63, 379–383.
- Pflanz, S., Henderson, I.S., McElduff, N., & Jones, M.C. (1994). Calcium acetate versus calcium carbonate as phosphate-binding agents in chronic haemodialysis. *Nephrol Dial Transplant*, 9, 1121–4.
- Seaford pharmaceuticals INC. *BinaphosCM LB*. Advertisement. Received September 18, 2012.
- Shigematsu, T. (2008). Lanthanum carbonate effectively controls serum phosphate without affecting serum calcium levels in patients undergoing hemodialysis. *There Apher Dial*, 12, 55–61.
- Smilkstein, M., Smolinske, S., Kulig, K., & Rumack, B. (1988). Severe hypermagnesemia due to multiple-dose cathartic therapy—Table 2. *The Western Journal of Medicine*, 148(2), 208–211.
- Spiegel, D., Farmer, B., Smits, G., & Chonchol, M. (2007). Magnesium carbonate is an effective phosphate binder for chronic hemodialysis patients: A pilot study. *Journal of Renal Nutrition*, 17(6), 216–422.
- St. Peter, W.L., Liu, J., Weinhandle, E., & Fan, Q. (2008). A comparison of sevelamer and calcium based phosphate binders on mortality, hospitalization, and morbidity in hemodialysis: A secondary analysis of the Dialysis Clinical Outcomes Revisited (DCOR) randomized trial using claims data. *Am J Kidney Dis*, 51, 445–54.
- Suki, W.N., Zabaneh, R., Cangiano, J.L., Reed, J., Fischer, D., Garrett, L., Ling, B.N., ... Burke, S.K. (2007). Effects of sevelamer and calcium-based phosphate binders on mortality in hemodialysis patients. *Kidney Int*, 72, 1130–7.
- Tomasello S. (2007). Bone metabolism and disease in chronic kidney disease. Pharmacotherapy self-assessment program 6th ed. *Nephrology II*, 55–67.
- Tonelli, M., Wiebe, N., Culleton, B., Lee, H., Klarenbach, S., Shrive, F. Manns, B., Alberta Kidney Disease Network. (2007). Systematic review of the clinical efficacy and safety of sevelamer in dialysis patients. *Nephrol Dial Transplant*, 22, 2856–66.
- Tonelli M., Pannu N., & Manns B. (2010). Oral phosphate binders in patients with kidney failure. *NEJM*, 362, 1312–24.
- Tzanakis, T., Papadaki, A., Wei, M., Oreopoulos, D., Kagia, S., Spadidakis, V., & Kallivretakis, N. (2008). Magnesium carbonate for phosphate control in patients on hemodialysis. A randomized controlled trial. *Int Urol Nephrol*, 40, 193–201.

New agent to treat elevated phosphate levels: Magnesium carbonate/calcium carbonate tablets

By Caitlin Meyer, Karen Cameron, BScPhm, ACPR, CGP, and Marisa Battistella, BScPhm, PharmD, ACPR

Copyright © 2012 Canadian Association of Nephrology Nurses and Technologists

1. At which estimated glomerular filtration rate (eGFR) does the body's natural compensatory mechanisms become impaired and phosphate levels rise considerably?
 - (a) 60 ml/min/m²
 - (b) 30 ml/min/m²
 - (c) 25 ml/min/m²
 - (d) 15 ml/min/m²
2. All of the following factors increase phosphorous in the serum except for:
 - (a) diet
 - (b) vitamin D
 - (c) PTH
 - (d) calcium
3. High levels of serum phosphorous lead to all the following except:
 - (a) mortality
 - (b) calcification
 - (c) pruritis
 - (d) hyperlipidemia
4. All of the following drugs are considered phosphate binders except:
 - (a) magnesium
 - (b) calcium
 - (c) zinc
 - (d) sevelamer
 - (e) lanthanum
5. The highest concern associated with the use of magnesium carbonate/calcium carbonate as a phosphate binder is:
 - (a) constipation
 - (b) hypermagnesemia
 - (c) decreased phosphate levels
 - (d) rash
6. What is the greatest limitation associated with the published trials with this new magnesium carbonate/calcium carbonate product?
 - (a) studies were open label
 - (b) only dialysis patients were studied
 - (c) studies were of short duration and no long-term data were collected
 - (d) only PD patients were studied
7. The most effective way to administer Binaphos CM[®] is:
 - (a) on an empty stomach
 - (b) one hour after meals
 - (c) with meals and snacks
 - (d) every morning and bedtime
8. In the three published trials, the comparative arm group consisted of:
 - (a) sevelamer
 - (b) lanthanum
 - (c) calcium
 - (d) aluminum
9. Hypermagnesemia symptoms (>1.5 mmol/L) may include:
 - (a) nausea, vomiting and skin flushing
 - (b) pruritic rash
 - (c) numbness and tingling
 - (d) hypertension
10. Oral iron supplements should be taken one or two hours before or after taking Binaphos CM[®] in order to:
 - (a) prevent nausea and vomiting
 - (b) prevent constipation
 - (c) enhance iron absorption
 - (d) enhance phosphate binding effects

CONTINUING EDUCATION STUDY
ANSWER FORM

CE: 2.0 hrs continuing education

New agent to treat elevated phosphate levels: Magnesium carbonate/calcium carbonate tablets

Volume 22, Number 4

By Caitlin Meyer, Karen Cameron, BScPhm, ACPR, CGP, and Marisa Battistella, BScPhm, PharmD, ACPR

Post-test instructions:

- Select the best answer and circle the appropriate letter on the answer grid below.
- Complete the evaluation.
- Send only this answer form (or a photocopy) to:
CANNT National Office,
P.O. Box 319, 59 Millmanor Place,
Delaware, ON N0L 1E0
or submit online to www.cannt.ca
- Enclose a cheque or money order payable to CANNT.
- Post-tests must be postmarked by December 30, 2014.
- If you receive a passing score of 80% or better, a certificate for 2.0 contact hours will be awarded by CANNT.
- Please allow six to eight weeks for processing. You may submit multiple answer forms in one mailing, however, you may not receive all certificates at one time.

CANNT member – \$12 + HST (\$13.56); Non-member – \$15 + HST (\$16.95)

Post-test answer grid*Please circle your answer choice:*

- a b c d
- a b c d
- a b c d
- a b c d e
- a b c d
- a b c d
- a b c d
- a b c d
- a b c d
- a b c d

Evaluation

	Strongly disagree			Strongly agree		
1. The offering met the stated objectives.	1	2	3	4	5	
2. The content was related to the objectives.	1	2	3	4	5	
3. This study format was effective for the content.	1	2	3	4	5	
4. Minutes required to read and complete:	50	75	100	125	150	

Comments: _____

Complete the following:

Name: _____

Address: _____

CANNT member? ☐ Yes ☐ No Expiration date of card _____

Establishing a successful intradialytic exercise program: Part 2 of 2

By Kristen Parker, MKin, CEP, CSCS, MES

Copyright © 2012 Canadian Association of Nephrology Nurses and Technologists

Once your management team and dialysis unit staff embraces the decision to start an intradialytic exercise program, you may wish to adopt these proven methods from our Southern Alberta Renal Program (SARP). The following sections outline the processes we have utilized for the last four years.

First things first—Equipment and training

1. When we started, we ordered two bikes at two dialysis sites (15 to 20 hemodialysis stations each). The excitement was evident when the bikes arrived and were set up on the unit floor! (At present, each unit has three to four bikes with each bike receiving about three hours of use/day).
2. Then, we focused on staff in-services and bike orientations. This is when you start to create a new culture of exercise in your unit and shift mind-sets.
3. Policies and procedures were created, job descriptions were updated to include exercise-related tasks for nurses, and a staff exercise reference binder was compiled for the unit.

Getting patients cleared to begin exercising

- 1) All patients in the unit are assessed for exercise. The exclusion criteria include the following:
 - Compromised cardiac profiles—such as a myocardial infarction (MI) in the last six months, unstable angina, uncompensated congested heart failure (CHF), third degree atrioventricular (AV) block without a pacemaker, and so on.

- Severe bone disease (i.e., a significant history of fractures) or physical limitations that can be exacerbated by exercise.
- Problems with access site (central venous catheter [CVC] or arterio-venous fistula [AVF]) resulting in repetitive machine alarms. If a patient is needing a new fistula, we recommend waiting until at least three consecutive successful dialysis runs with non-problematic needling before returning to or starting the bike program. Patients with new CVCs have been able to return to the bike immediately after this procedure.

After the nephrologist or physician has cleared the patient, exercise may start.

2. Next, the kinesiologist, or “exercise” nurse, completes the Exercise Needs Assessment. This questionnaire covers all medical history, blood work, musculoskeletal issues, falls risk, past and current exercise habits, and so on.
3. We create an “exercise chapter” in the patient chart (which includes the Exercise Needs Assessment & Exercise Log Sheet) and schedule a “trial bike date”.
4. Finally, we use easy-to-administer fitness tests that give us an idea of the efficacy of our program and the patients’ improvements. This is very motivating to both patients and staff! The following tests are being used in our units by the kinesiologist:
 - DASI (Duke Activity Status Index): These are 12 simple questions, which predict VO_2 Max/aerobic capacity (Ravani et al., 2012).

- 30-second “Sit to Stand”: This is a simple test of muscular strength for lower body. We have seen a 43% improvement in this measure after only one month of biking. This is a highly valid and reliable test for hemodialysis patients. However, we prefer to use a 30-second sit-to-stand rather than a longer 60-second version (Segura-Ortí and Martínez-Olmos, 2011).
- Grip Strength: Grip strength has been shown to be highly correlated with mortality in HD patients (Yoda et al., 2012). This is not an essential test, however, using a dynamometer, we can test our patients’ grip strength quickly and have an idea of upper body strength.
- Resting blood pressure (BP), resting heart rate (HR), urea reduction ration (URR), body mass index (BMI) and hemoglobin A1C (HbA1C): These values can be taken from the patient’s chart or medical history.

Starting the bike

Once patients are cleared for exercise, assessed and ready to start, a five- to 10-minute trial on the bike is offered. The kinesiologist or exercise nurse will use this time to review safety issues, as well as guidelines for blood pressure, heart rate and exercise intensity. In our units, we try to keep “hands-on” time with each patient to five minutes for set up and take off. This allows staff to fit the task into their busy routine. In our SARP units, we have as many as 11 out of 15 patients biking on three to four different bikes during a single dialysis run. It truly becomes a game of “musical bikes” and a strategy needs to form in order to get all patients a turn on the bike. We aim to exercise all patients within the first two hours of dialysis to reduce the risk of hypotension.

For support in setting up an intradialytic exercise program or to share your success stories, contact Kristen at: 3103-31 Sunpark Plaza SE, Calgary, AB T2X 3W5 403-943-9402. kristen.parker@albertahealthservices.ca

Department Editor: Eleanor Ravenscroft, RN, PhD, CNePh(C)

Note that after patients have completed their initial five- to 10-minute “trial” on their first session, we aim to increase duration by 1 to 2 minutes/session or by 10% increments, as tolerated. Lower-functioning patients may work towards a goal of 30 minutes, and higher-functioning patients can exercise up to 60 minutes, as tolerated.

Assessment prior to biking each run

Each dialysis run, the following questions help staff decide if the patient is able to safely exercise:

- Does the patient wish to exercise today?
- Are pre-exercise vitals within our guidelines for exercise?
 - BP <180/100 mmHg or >100/50 mmHg
 - Blood sugars are between 7–14 mmol (if diabetic, these values are checked in the first two weeks of exercise)
 - Resting oxygen (O₂) saturation >90%
- Is their fluid gain below 3 kg? Some patients may still exercise if clearing between 3–5 kg. In this case, we follow an algorithm to decide if exercise is safe and we examine each situation individually. (Fluid gains above 5 kg are a relative contraindication and exercise might need to be deferred for the day. This particular situation still depends upon the individual.)
- Are there any problems with the AVF needles or CVC?
- Are there any unusual symptoms (shortness of breath [SOB], fever, nausea, pain, etc.) today?
- How did they feel during their last few dialysis sessions?

There is also no exercise recommended if the patient has flu or cold-like symptoms, missed their last dialysis treatment, or was hospitalized within the last week.

Patients with diabetes who are new to our program have pre and post exercise blood sugars taken for the first three exercise sessions greater than 10 minutes in duration. Another check of blood sugars is done when the patient is doing their first workout of greater than 45 minutes. This will help staff understand the response the patient has to exercise. If a patient is experiencing symptoms

of hypoglycemia, has recent changes to insulin or diabetic meds, or is exercising for longer than 45 minutes, we resume checking blood sugars to ensure they are stable.

Quick tips for a typical exercise session

1. Log all pre-exercise resting vitals (BP, HR, O₂ sats) in Exercise Log Sheet in chart.
2. Patients need a five-minute warm-up (or longer if they suffer from multiple sclerosis [MS], fibromyalgia, severe osteoarthritis [OA], etc.).
3. Exercise intensity is measured by a 0- to 10-point Rating of Perceived Exertion (RPE) scale. We encourage a warm-up pace of “2/10” (easy) and a main pace of “3/10 or 4/10” (moderate to somewhat hard).
4. Mid-exercise vitals are taken and recorded to illustrate the patient’s response to exercise. Encourage a slower pace if blood pressure is higher than 200/100 mmHg. Normal blood pressure responses to exercise require the systolic pressure to rise while the diastolic pressure remains similar to resting values. Slight drops in systolic pressure may also occur since our population is removing fluid while exercising. If this happens, we will check that the patient does not have abnormal symptoms (lightheadedness or dizziness), and then monitor blood pressure to ensure it stays within guidelines during exercise. O₂ saturation should stay above 90% and the heart rate should remain below 130 beats per minute (bpm).
5. The cool down should be two minutes at an “easy pace” or RPE of 2/10. Longer cool downs (five minutes long) are essential if your patient tends to have hypotension during their dialysis runs, or if they have an extensive cardiac history.
6. Post-exercise vitals such as blood pressure, heart rate and O₂ saturation are taken two minutes after the exercise session is completed. All vital signs are recorded on the Exercise Log Sheet.

*Please note that these are guidelines. We have been revising our policies over the years. You may need to adjust your program guidelines to fit the needs of your staff and patients.

Creating success

Creating a “culture of exercise” is highly important in running a successful intradialytic exercise program. Patients and staff alike need to be motivated and engaged for continued participation. At new exercise sites, it is encouraged to have an exercise “Kick Off” party in which senior management, nephrologists, nurses, media and representatives from the Kidney Foundation of Canada or YMCA are present to celebrate and educate on the importance of “exercise as medicine”. Patients enjoy this and it gives staff a break from the daily routine.

Our SARP units also have educational themes such as “Fall Prevention Month” or “The Benefits of Strength Training” with posters in the waiting area.

With the excitement leading up to the 2010 Olympics, our Monday-Wednesday-Friday patients competed against the Tuesday-Thursday-Saturday patients in the “Race to the Vancouver Olympics”. Over the course of six months, we watched the Alberta/British Columbia map in the unit show the location of our two teams as they pedalled 600 miles from Calgary to Vancouver. The goal was to be the first team to Vancouver. The kinesiologist calculated the mileage each week and posted it on the map. The response was incredible! Patients were pedalling faster and longer. Competitiveness became evident when friendly “banter” amongst patients helped add comic relief to the unit atmosphere. The top three (Gold, Silver and Bronze medallists) from each team took home a pair of Olympic red mittens and the winning team had a party with food, door prizes and a visit from a local Olympic medallist.

Another successful program was the first annual Kidney March, which was started in 2010 by the Alberta Branch of the Kidney Foundation of Canada. Most patients were unable to do the three-day, 100-km walk from Kananaskis Country to Calgary, but were happy to get involved in a different way and raise money by pedalling 100 km over three months. Our patients raised \$10,000.00 in the first year! We expanded our program this year to include a competition between four dialysis units in the Southern Alberta Renal Program. Every 30 minutes of exercise would equal 2.5 km. Those who chose not to bike during dialysis could log their activities

such as bowling, gardening, tai chi, and strength training to accumulate their distance. The combined distance from all participants was more than 16,000 km! Our IT department kindly tracked this on a Google map of Canada with a link through our SARP website.

Other patient programs and ideas include:

- 12 Days of Christmas—patients who exercise (in unit or at home) 12 times in December win a pedometer from Santa.
- Celebrating milestones—we have given prizes and certificates of recognition for 100th workouts.
- Staff versus patients competition/“Adopt a patient” staff-patient buddy system.

References

Anonymous. (n.d.). Exercise to maintain physical fitness. Retrieved October 16, 2012 from <http://www.seniors-site.com/sports/exercise.html>

Bennett, P.N. (2010). How a culture of exercise benefits patients on dialysis. *Journal of Renal Nursing*, 2(2), 64–68.

Ravani P, Kilb, B., Bedi, H., Groeneveld, S., Yilmaz, S., & Mustata, S. (2012). The

In conclusion

The current body of research overwhelmingly supports the efficacy and safety of exercise as a standard of care in Canada’s dialysis units. We are at a crossroads and must embrace the idea that exercise is medicine. Consider the words of Dr. Robert N. Butler, Director of the National Institute on Aging, “If exercise could be packaged into a pill, it would be the single most widely prescribed, and beneficial medicine in the world” (as cited on www.seniors-site.com/sports/exercise.html).

About the author

Kristen Parker, MKin, CEP, CSCS, MES, is a Clinical Kinesiologist with the Southern Alberta Renal Program and is based out of Calgary, Alberta.

For support in setting up an intradialytic exercise program or to share your success stories, contact Kristen at:

kristen.parker@albertahealthservices.ca

Acknowledgement

The author would like to acknowledge the ongoing support of nursing staff who work tirelessly to keep our patients as active as possible. Also, thank you to Nathalie Tang for her insightful edits. Finally, the patients within the Southern Alberta Renal Program are to be commended for taking control of their health and for exercising at our units with a smile on their faces. The passion and enthusiasm of all these people make for a successful program.

Duke Activity Status Index in patients with chronic kidney disease: A reliability study. *Clinical Journal of the American Society of Nephrology*, 7(4), 573–580.

Segura-Ortí, E., & Martínez-Olmos, F. (2011). Test-retest reliability and minimal detectable change scores for sit-to-stand tests, the six-minute walk test, the one-leg heel-rise test, and handgrip

strength in people undergoing hemodialysis. *Physical Therapy*, 91, 1244–1252.

Yoda, M., Inaba, M., Okuno, S., Yoda, K., Yamada, S., Imanishi, Y., ... Shoji, S. (2012). Poor muscle quality as a predictor of high mortality independent of diabetes in hemodialysis patients. *Biomedical Pharmacotherapy*. 66(4), 266–270.

DID YOU KNOW...?



Now it's even easier for you to get hold of the CANNT/ACITN National Office

- 1) Call TOLL-FREE from anywhere in Canada/US: 1-877-720-2819 or local dial 519-652-0364
- 2) email: cannt@cannt.ca
- 3) Fax: 519-652-5015
- 4) Mail: P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0



STAY CONNECTED... WE'RE HERE TO HELP

Guidelines for authors

The Canadian Association of Nephrology Nurses and Technologists (CANNT) Journal invites letters to the editor and original manuscripts for publication in its quarterly journal. We are pleased to accept submissions in either official language—English or French.

Which topics are appropriate for letters to the editor?

We welcome letters to the editor concerning recently published manuscripts, association activities, or other matters you think may be of interest to the CANNT membership.

What types of manuscripts are suitable for publication?

We prefer manuscripts that present new clinical information or address issues of special interest to nephrology nurses and technologists. In particular, we are looking for:

- Original research papers
- Relevant clinical articles
- Innovative quality improvement reports
- Narratives that describe the nursing experience
- Interdisciplinary practice questions and answers
- Reviews of current articles, books and videotapes
- Continuing education articles.

How should the manuscript be prepared?

Form: The manuscript should be typed double-spaced, one-inch margins should be used throughout, and the pages should be numbered consecutively in the upper right-hand corner. More formal research or clinical articles should be between five and 15 pages. Less formal narratives, question and answer columns, or reviews should be fewer than five pages.

Style: The style of the manuscript should be based on the **Publication Manual of the American Psychological Association (APA)**, Sixth Edition (2009), available from most college bookstores.

Title page: The title page should contain the manuscript title, each author's name (including full first name), professional qualifications [e.g., RN, BScN, CNeph(C)], position, place of employment, address, telephone, fax numbers and email address. The preferred address for correspondence should be indicated.

Abstract: On a separate page, formal research or clinical articles should have an abstract of 100 to 150 words. The abstract should summarize the main points in the manuscript.

Text: Proper names should be spelled out the first time they are used with the abbreviation following in brackets, for example, the Canadian Association of Nephrology Nurses and Technologists (CANNT). Generic drug names should be used. Measurements are to be in Standards International (SI) units. References should be cited in the text using APA format. A reference list containing the full citation of all references used in the manuscript must follow the text.

Tables/Figures: Manuscripts should only include those tables or figures that serve to clarify details. Authors using previously published tables and figures must include written permission from the original publisher. Such permission must be attached to the submitted manuscript.

How should the manuscript be submitted?

Email your manuscript to: athomas6@cogeco.ca

Include a covering letter with contact information for the primary author and a one-sentence biographical sketch (credentials, current job title and location) for each author.

How are manuscripts selected for the CANNT Journal?

Each manuscript will be acknowledged following receipt. Research and clinical articles are sent out to two members of the **CANNT Journal** manuscript review panel to be reviewed in a double-blind review process. All manuscripts may be returned for revision and resubmission. Those manuscripts accepted for publication are subject to copy editing; however, the author will have an opportunity to approve editorial changes to the manuscript. The criteria for acceptance for all articles include originality of ideas, timeliness of the topic, quality of the material, and appeal to the readership. Authors should note that manuscripts will be considered for publication on the condition that they are submitted solely to the **CANNT Journal**. Upon acceptance of submitted material, the author(s) transfer copyright ownership to CANNT. Material may not be reproduced without written permission of CANNT. Statements and opinions contained within the work remain the responsibility of the author(s). The editor reserves the right to accept or reject manuscripts.

Checklist for authors

✓ Cover letter

✓ Article

- Title page to include the following:
 - title of article
 - each author's name (including full first name)
 - professional qualifications
 - position
 - place of employment
 - author to whom correspondence is to be sent, including address, phone, fax number, and email address
- Text of article, with abstract if applicable, **double-spaced, pages numbered**
- References (on a separate sheet)
- Tables (one per page)
- Illustrations (one per page)
- Letters of permission to reproduce previously published material.

Lignes directrices à l'intention des auteurs

Le **Journal de l'Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN)** vous invite à faire parvenir articles, textes et manuscrits originaux pour publication dans son journal trimestriel. Nous sommes heureux d'accepter vos documents soumis dans l'une ou l'autre des langues officielles, anglais ou français.

Quels sont les sujets d'article appropriés ?

Nous acceptons les articles portant sur des manuscrits récemment publiés, des activités de l'Association ou tout sujet d'intérêt pour les membres de l'ACITN.

Quels types de manuscrits conviennent à la publication ?

Nous préférons des manuscrits qui présentent de nouveaux renseignements cliniques ou qui traitent des enjeux propres aux champs d'intérêt des infirmières et infirmiers et des technologues en néphrologie. Nous recherchons plus particulièrement :

- Exposés de recherche originaux
- Articles cliniques pertinents
- Rapports sur des approches innovatrices en matière d'amélioration de la qualité
- Textes narratifs relatant une expérience de pratique infirmière ou technologique
- Textes sous forme de questions et de réponses sur la pratique interdisciplinaire
- Revues d'articles courants, de livres et films
- Articles en éducation continue.

Comment les manuscrits doivent-ils être présentés ?

Forme: Le manuscrit doit être présenté à double interligne avec une marge de 1 po et une numérotation consécutive des pages dans le coin supérieur droit de la page. Les articles plus formels de recherche ou d'études cliniques doivent compter de 5 à 15 pages. Les articles moins formels, tels que textes narratifs, questions-réponses ou revues, doivent compter moins de 5 pages.

Style: Le style du manuscrit doit être conforme au manuel de publication de l'Association américaine de psychologie (AAP), 6^e édition (2009), offert dans la plupart des librairies universitaires.

Page titre: La page titre doit inclure le titre du manuscrit ainsi que les renseignements suivants: nom de chacun des auteurs (incluant prénoms au complet), titres professionnels (c.-à-d., inf., B.Sc.Inf., CNéph[C]), titre du poste occupé, nom de l'employeur, adresse, numéros de téléphone et de télécopieur et adresse courriel. L'adresse privilégiée de correspondance doit aussi être indiquée.

Résumé: Sur une page distincte, les articles formels de recherche ou d'études cliniques doivent être accompagnés d'un résumé de 100 à 150 mots, reprenant brièvement les principaux points du manuscrit.

Texte: Les sigles, abréviations ou acronymes doivent être écrits au long la première fois qu'ils apparaissent dans le texte, suivis de l'abréviation entre parenthèses; p. ex., Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN). Les noms génériques des médicaments doivent être employés. Les unités de mesure doivent être indiquées selon le Système international d'unités (SI). Les références doivent être citées dans le texte en utilisant le format de l'AAP. Une liste de références comprenant la bibliographie complète de toutes les références utilisées doit suivre le texte.

Tableaux/Figures: Les manuscrits ne doivent inclure que les tableaux et figures (incluant schémas, illustrations, croquis, etc.) visant à clarifier certains détails. Les auteurs qui utilisent des tableaux et des figures qui ont déjà fait l'objet d'une publication doivent fournir l'autorisation écrite de l'éditeur d'origine et la joindre au manuscrit soumis.

De quelle manière doit-on soumettre les manuscrits ?

Veuillez envoyer par courriel votre manuscrit à :

athomas6@cogeco.ca

Veuillez inclure une lettre de présentation en précisant les coordonnées de l'auteur principal ainsi qu'une notice biographique d'une phrase (incluant titres de compétences, titre du poste actuel et lieu de travail) pour chaque auteur.

Quel est le processus de sélection des manuscrits pour publication dans le Journal de l'ACITN ?

À la réception de chaque manuscrit, un accusé de réception est envoyé. Les articles de recherche et d'études cliniques sont envoyés à deux membres du comité de révision du **Journal de l'ACITN** afin d'être révisés suivant un processus à double insu. Tous les articles peuvent être retournés aux auteurs pour révision et nouvelle soumission par la suite. Les manuscrits acceptés pour publication peuvent subir des changements éditoriaux; toutefois, les auteurs pourront approuver ces changements. Les critères d'acceptation pour tous les manuscrits comprennent l'originalité des idées, l'actualité du sujet, la qualité du matériel et l'attrait des lecteurs.

Les auteurs doivent prendre note que les manuscrits seront considérés pour publication à la condition qu'ils ne soient soumis qu'au **Journal de l'ACITN**. Sur acceptation du matériel soumis, les auteurs transfèrent leur droit d'auteur à l'ACITN. Aucune reproduction n'est permise sans l'autorisation écrite du **Journal de l'ACITN**. Les déclarations et opinions émises par les auteurs dans leurs articles, textes ou manuscrits demeurent leur responsabilité. La rédactrice en chef se réserve le droit d'accepter ou de refuser tout manuscrit.

Aide-mémoire à l'intention des auteurs

✓ Lettre de présentation

✓ Article

- Page titre incluant les renseignements suivants:
 - Titre de l'article
 - Nom de chaque auteur (incluant prénoms au complet)
 - Titres de compétences
 - Titre du poste actuel
 - Nom et adresse de l'employeur
 - Nom de l'auteur à qui la correspondance doit être envoyée (incluant adresse, numéros de téléphone et de télécopieur et adresse courriel)
- Texte de l'article avec résumé, s'il y a lieu à **double interligne et pages numérotées**
- Références (sur une feuille distincte)
- Tableaux (un par page)
- Figures (une par page)
- Lettre d'autorisation pour tout matériel ayant déjà fait l'objet d'une publication

“Stay in the Know” at www.cannt.ca

Visit your CANNT website for:

- “What’s New” at a glance
- nephrology job postings
- educational resources: awards/bursaries/grant applications
- PDF articles of previous CANNT Journal issues
- online continuing education articles that earn you CEU credits
- links to educational and professional affiliate websites
- CANNT merchandise available in our online store
- regional report updates and our annual CANNT/ACITN report
- CANNT Nursing and Technical Practice Standards, revised 2008
- national nephrology certification information and exam preparation support
- regional, national and international educational events information
- National Nephrology Professionals’ Day information—discover how colleagues from across Canada celebrate the day
- CANNT National Symposium 2013 details and updates

Join or renew your CANNT membership online today at www.cannt.ca!

CANNT Corporate Sponsors 2012

Platinum

AMGEN®

Baxter



Fresenius Medical Care



Gold



Silver

genzyme



JANSSEN-ORTHO

Bronze



Please send all submissions, questions or comments to:

Alison Thomas and Janet Baker, Co-Editors, CANNT Journal, email:

Janet Baker: jbaker@haltonhealthcare.on.ca

Alison Thomas: athomas6@cogeco.ca

• Are you moving? Let us know. In order to ensure undelayed delivery of your CANNT Journal and other communications, please indicate corrections or a change of address as soon as possible and mail to: Heather Reid, CANNT, P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0.

• Déménagez-vous? Avertissez nous. Afin d’assurer la livraison ininterrompue de votre journal de l’ACITN ainsi qu’autre correspondance, veuillez indiquer toute correction ou changement d’adresse à l’association aussitôt que possible en complétant ce formulaire et le poster à: Heather Reid, ACITN, P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0.

Name/Nom: _____ Moving Date/Date de déménagement: _____

Address/Adresse: _____

Street No./No.

Street/Rue

Apt./App

City/Ville


Province

Postal Code Postal



^{Pr} ***cathflo***[®]
(alteplase) 2 mg

^{Pr}CATHFLO[®] (alteplase, recombinant) is indicated for the restoration of function to central venous access devices.
Product monograph available at www.rochecanada.com

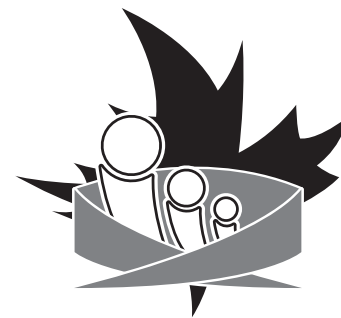
 Registered Trade-Mark of Hoffmann-La Roche Limited

CATHFLO[®] Registered Trade-Mark of Genentech, Inc., used under licence

Hoffmann-La Roche Limited
Mississauga, ON L5N 6L7



CANNT Membership



First Name _____

Last Name _____

Home Address _____

City _____

Province _____ Postal Code _____

Telephone (H) (____) ____ - _____

(W) (____) ____ - _____

Fax (____) ____ - _____

Email _____

Employer _____

Employer Address _____

City _____

Province _____ Postal Code _____

Mailing Address Preferred ☐ Home ☐ Work

Do you consent to the use of your name and address on mailing lists that CANNT has considered pertinent and appropriate? ☐ Yes ☐ No

☐ New Member or ☐ Renewal

CANNT # (if renewal): _____

Person who recommended
joining CANNT: _____

Membership Fee (GST #100759869)

Membership fee is tax deductible.

☐ One Year: \$70.00 + HST/GST

☐ Two Years: \$130.00 + HST/GST

☐ Student Rate: \$35.00 + HST/GST*

**Proof of full-time enrolment must accompany application*

BC: 12% HST; AB/SK/MB/PE/NT/NU/QC/YT: 5% GST;

ON/NL: 13% HST; NS: 15% HST

I enclose \$ _____

made payable to Canadian Association
of Nephrology Nurses and Technologists.

Method of payment:

☐ Cheque ☐ Money order ☐ Visa ☐ Mastercard

Cardholder Name: _____

Visa Number: _____

Expiry Date: _____

Signature: _____

☐ I have attained CNeph(C)/cdt designation

Year of designation _____

Professional registration # _____

Date last renewed: _____

☐ I am a member of CNA

Ontario applicants only

Do you belong to RNAO?

☐ Yes ☐ No

Professional Status

☐ Registered Nurse

☐ Registered Practical Nurse/
Registered Nursing Assistant/
Licensed Practical Nurse

☐ Technician

☐ Technologist

☐ Other (Specify) _____

Number of years in nephrology _____

Area of responsibility

☐ Direct Patient Care

☐ Administration

☐ Technical

☐ Teaching

☐ Research

☐ Other (Specify) _____

Work environment

☐ Acute Care

☐ Self-Care Unit

☐ Independent Health Care

☐ Private Sector

Highest level of education

Nursing

☐ Diploma

☐ Baccalaureate

☐ Master's

☐ Doctorate

Non-Nursing

☐ Diploma

☐ Baccalaureate

☐ Master's

☐ Doctorate

I am at present studying toward

Nursing

☐ Specialty Certificate

☐ Baccalaureate

☐ Master's

☐ Doctorate

Non-Nursing

☐ Specialty Certificate

☐ Baccalaureate

☐ Master's

☐ Doctorate

Primary area of practice

☐ Progressive renal insufficiency (pre-dialysis)

☐ Transplantation

☐ Hemodialysis

☐ Peritoneal

☐ Pediatrics

☐ Other (Specify) _____

Return to CANNT

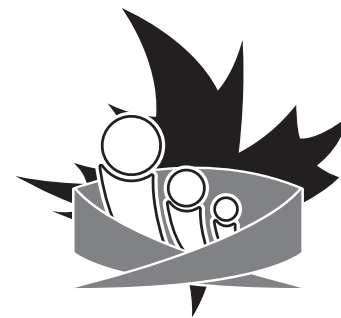
Mailing Address:

Heather Reid, CANNT,

P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0

Telephone (519) 652-0364 Fax (519) 652-5015

Demande d'adhésion



Prénom _____

Nom de famille _____

Adresse à domicile _____

Ville _____

Province _____ Code postal _____

Téléphone (D) (____) ____ - _____

(T) (____) ____ - _____

Télécopieur (____) ____ - _____

Courrier électronique _____

Employeur _____

Adresse de l'employeur _____

Ville _____

Province _____ Code postal _____

Adresse de correspondance ☐ domicile ☐ travail

Acceptez-vous que l'ACITN ajoute votre nom et votre adresse sur des listes d'envois qu'elle juge pertinentes et appropriées? ☐ Yes ☐ No

☐ Nouveau membre ou ☐ Renouvellement

Numéro de l'ACITN # (si renouvellement): _____

Nom de la personne qui vous a recommandé de joindre l'ACITN: _____

Frais d'adhésion (TPS #100759869)

Les frais d'adhésion sont deductibles d'impôts.

☐ Un an: 70,00 \$ + TVH/TPS

☐ Deux ans: 130,00 \$ + TVH/TPS

☐ Tarif étudiant: 35,00 \$ + TVH/TPS*

*La demande doit inclure une preuve d'inscription à plein temps
BC: 12 % TVH; AB/SK/MB/PE/NT/NU/QC/YT: 5 % TPS;
ON/NL: 13 % HST; NS: 15 % TVH

Je joins \$ _____
payable à l'ACITN.

Mode de paiement:

☐ Chèque ☐ Mandat de poste ou chèque visé

☐ Visa ☐ Mastercard

Nom du titulaire de la carte: _____

Numéro de la carte: _____

Date d'expiration: _____

Signature: _____

☐ J'ai obtenu la désignation CNeph(C)/cdt
Année de désignation _____

Numéro d'enregistrement professionnel: _____

Date du dernier renouvellement: _____

☐ Je suis membre de l'ACI

Demandeurs de l'Ontario seulement

Faites vous partie de l'AOIA?

☐ Oui ☐ Non

Statut professionnel

☐ Infirmière(ier) autorisée(sé)

☐ Infirmière(ier) auxiliaire autorisée(sé) /
infirmière(ier) auxiliaire

☐ Technicienne /technicien

☐ Technologue

☐ Autre (spécifier) _____

Années d'expérience en néphrologie _____

Domaine de responsabilité

☐ Soins directs

☐ Enseignement

☐ Administration

☐ Recherche

☐ Technologie

☐ Autre (spécifier) _____

Milieu de travail

☐ Soins actifs

☐ Services de santé indépendants

☐ Unité d'autosoins

☐ Secteur privé

Plus haut niveau d'instruction?

Infirmière(ier)

Autres

☐ Diplôme

☐ Diplôme

☐ Baccalauréat

☐ Baccalauréat

☐ Maîtrise

☐ Maîtrise

☐ Doctorat

☐ Doctorat

Je poursuis présentement des études

Domaine infirmière(ier)

Autre domaine

☐ Certificat

☐ Certificat

☐ Baccalauréat

☐ Baccalauréat

☐ Maîtrise

☐ Maîtrise

☐ Doctorat

☐ Doctorat

Secteur de pratique spécialisé

☐ Insuffisance rénale progressive (pré-dialyse)

☐ Transplantation

☐ Hémodialyse

☐ Péritonéale

☐ Pédiatrie

☐ Autre (spécifier) _____

Poster à ACITN

Adresse postale:

Heather Reid, ACITN,

P.O. Box 319, 59 Millmanor Place, Delaware, ON N0L 1E0

Téléphone (519) 652-0364 Télécopieur (519) 652-5015