

Volume 26, Issue 2 April–June 2016



CONTENTS

- 10 CANNT 2016: Changing the Face of Tomorrow October 27–29, London, ON Conference abstracts
- 21 Are you SURE about your vascular access? Exploring factors influencing vascular access decisions with chronic hemodialysis patients and their nurses

By Mary Ann Murray, Alison Thomas, Ron Wald, Rosa Marticorena, Sandra Donnelly, and Leanne Jeffs

29 An evaluation of medication reconciliation in an outpatient nephrology clinic

By Matthew Phillips, Jo-Anne Wilson, Amany Aly, Marsha Wood, Penelope Poyah, Sarah Drost, Anne Hiltz, and Holly Carver

The Canadian Organ Replacement Register: From data submission to final reports

By Alison Thomas

CANNT JOURNAL JOURNAL ACITN



CONTENTS

- **CANNT 2016: Changing the Face of Tomorrow** October 27-29, London, ON **Conference abstracts**
- Are you SURE about your vascular access? Exploring factors influencing vascular access decisions with chronic hemodialysis patients and their nurses By Mary Ann Murray, Alison Thomas, Ron Wald, Rosa Marticorena, Sandra Donnelly, and Leanne Jeffs
- 29 An evaluation of medication reconciliation in an outpatient nephrology clinic

By Matthew Phillips, Jo-Anne Wilson, Amany Aly, Marsha Wood, Penelope Poyah, Sarah Drost, Anne Hiltz, and Holly Carver

34 The Canadian Organ Replacement Register: From data submission to final reports By Alison Thomas

IN EACH ISSUE:

- **LETTER FROM THE EDITORS:** Jovina Bachynski & Matt Phillips
- MOT DES CORÉDACTEURS **EN CHEF:** Jovina Bachynski et Matt Phillips
- 5 **MESSAGE FROM THE PRESIDENT: ANNE MOULTON**
- LE MOT DE LA PRESIDENTE : ANNE MOULTON
- **CANNT Representatives/** Contacts; Représentants/ contacts ACITN
- Notice Board
- Connect with CANNT!
- 38 CANNT Membership
- Demande d'adhésion



The CANNT Journal is the official publication of the Canadian Association of Nephrology Nurses and Technologists, P.O. Box 10, 59 Millmanor Place, Delaware, ON NOL 1E0, telephone: (519) 652-6767, fax: (519) 652-5015, email: cannt@cannt.ca. Published quarterly, the journal is received by all members of CANNT. Subscriptions are: Canada \$80.00 (plus HST), US. \$90.00, Outside N. America \$115.00. Back issues, when available, are \$7.50 (+HST) per issue and are available from the editors. Opinions expressed by writers in the CANNT Journal are not necessarily those held by the editors 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 10, 59 Millmanor Place, Delaware, ON NOL 1E0.

1-877-720-2819 Website: www.cannt.ca

The CANNT Journal accepts articles (manuscripts) on an ongoing basis.

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 2291-644X (Online) ISSN 1498-5136 (Print)

The CANNT Journal is produced by Pappin Communications, The Victoria Centre, 84 Isabella St., Unit 2, Pembroke, Ontario K8A 5S5

Co-Editors

Jovina Bachynski, RN(EC), MN-NP Adult, CNeph(C), (905) 845-2571 ext 6307 cannt.journal1@gmail.com

Matt Phillips, RN, BScN, MHS Work: (902) 473-7075 cannt.journal2@gmail.com

Managing Editor Heather Coughlin, Pembroke, Ontario

Layout and Design Sherri Keller, Pembroke, Ontario

Advertising Sales

Heather Coughlin, Pappin Communications 84 Isabella St., Unit 2, 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

Welcome to the spring issue of your CANNT Journal! In this issue, we are pleased to be able share articles on vascular access, medication reconciliation, and the second article in the Canadian Organ Replacement Registry (CORR) series. Also, please take some time to review the abstracts that will be showcased at the CANNT national conference this coming October. As you will see, there are some great abstracts for poster and oral presentations. We encourage all to come to the national conference, and meet the presenters in person. We'd also like to encourage all authors of posters and oral presentations to take their work to the next level, and consider submitting their work to the CANNT Journal.

As always, we accept and encourage submissions from seasoned and budding health care professionals in nephrology, as well as letters to the editor. We accept submissions related to original research, case studies, quality improvements, innovations in practice, and issues related to professionals in nephrology. Guidelines for submission are found on the CANNT website, and we accept submissions on an ongoing basis. If you have an idea for a publication, get in touch with us! See you in London!

Matt Phillips and Jovina Bachynski CANNT Journal Co-editors

MOT DES CORÉDACTEURS EN CHEF: JOVINA BACHYNSKI ET MATT PHILLIPS

Mot des corédacteurs en chef

Bienvenue à l'édition printanière de votre Journal de l'Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN)! Nous sommes heureux de vous y présenter des articles portant sur l'accès vasculaire et sur le bilan comparatif des médicaments ainsi que le second article de la série sur l'utilisation des données du Registre canadien des insuffisances et des transplantations d'organes (RCITO). De plus, veuillez prendre le temps de passer en revue les résumés qui seront présentés à l'occasion du congrès national de l'ACITN au mois d'octobre prochain. Vous constaterez que des résumés de grande qualité seront présentés sous forme d'affiches et d'exposés oraux. Nous vous encourageons toutes et tous à participer au congrès national et à y rencontrer les conférenciers en personne. Nous aimerions également inciter tous les auteurs d'affiches et d'exposés oraux à passer au niveau supérieur en soumettant le fruit de leur travail au *Journal de l'ACITN* à des fins de publication.

Comme toujours, nous acceptons et encourageons la soumission d'articles rédigés par des professionnels de la santé débutants et chevronnés travaillant dans le domaine de la néphrologie, ainsi que d'articles réservés à la tribune libre. Nous publions également des articles sur les sujets suivants : projets de recherche originaux, études de cas, amélioration de la qualité, innovation en matière de pratique et problèmes ou préoccupations touchant les professionnels en néphrologie. Vous trouverez les directives pour soumettre un article sur le site Web de l'ACITN. Vous pouvez soumettre le vôtre en tout temps. Vous avez quelque chose à publier? Communiquez avec nous!

Nous sommes impatients de vous retrouver à London!

Matt Phillips et Jovina Bachynski Corédacteurs du Journal de l'ACITN

Message from the President

Spring shows us that life is truly a constant beginning, a constant opportunity, a constant springtime. Following the turbulence of this past winter and early spring that featured a few parting shots of winter weather from the Prairies to Atlantic Canada, the season of activity and opportunity called springtime finally arrived. However, the mere arrival of spring is no sign that things are going to look good in the fall. We must do something with the spring and take advantage of the opportunities that spring can bring.

Your Board of Directors (BOD) continues to lead us from one season to the next, as they update and report the great work being undertaken in nephrology nursing and technical practice across Canada. The BOD has cited numerous nephrology-related activities, events, innovative practice changes, and work-related challenges since our last journal issue. Their dedication to CANNT and commitment to the sustainability of our organization are second to none.

Quebec has been working on a plan to reorganize the CKD program across the province to deliver a more standardized approach to care with a vision similar to the work being done in British Columbia and Ontario. Each hospital centre has been requested to develop a three-year plan describing how they will work towards the many objectives established by the Ministry of Health with the aim of creating this new vision for CKD management. At the Quebec Nephrology Group (REINQ) conference in March, the Ministry's plan for the future directions of nephrology in Quebec was the topic of discussion.

In Ontario, the planning committee for the CANNT National Symposium has been meeting regularly and working diligently with our conference planners to orchestrate an exciting and informative conference in London, Ontario, which will be held from October 27–29. Stay tuned for more information regarding

the symposium over the next several months! In collaboration with the Ontario Renal Network, renal programs are in the midst of developing an integrated strategy to ensure all CKD patients have access to consistent best-practice renal palliative care services in Ontario. This initiative hopes to improve the referral processes to palliative care for patients with end stage kidney disease, expand palliative care education for CKD health care professionals, and strengthen partnerships with hospices and other community palliative care supports across the province.

The provincial hemodialysis committee in British Columbia recently launched new evidence-based guidelines in an effort to standardize care for patients on hemodialysis across the province. Two of these guidelines are now available on the BC Renal Agency website - www.bcrenal.ca. Additionally, B.C. hosted its annual Western PD Days in March, a two-day conference that highlights the innovations and achievements in PD across the four western provinces of Canada. A new study published in the *Journal* of the American Medical Association (JAMA) in January 2016 confirmed the global significance of the work conducted by Dr. Navdeep Tangri, a Winnipeg researcher and nephrologist with the Manitoba Renal Program who invented a model to predict the risk of kidney failure.

Canadian Standards Association (CSA) Dialysis Committee has been working on revising and creating new standards related to all modalities of dialysis. The CSA group is a not-for-profit organization, much like CANNT, and operates through volunteers who are interested in shaping the best standards of technical practice and safety in dialysis. Technical advancements for kidney care have also been in the news recently. The "implantable artificial kidney" project has been making progress. The device uses microchip filters and living kidney cells that

Le Journal ACITN est la publication officielle de l'Association canadienne des infirmiers/ infirmières et technologues en néphrologie, a/s P.O. Box 10, 59 Millmanor Place, Delaware, ON NOL 1EO, téléphone : (519) 652-6767, 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, 80 \$ (+TVH), E.-U., 90 \$, hors du Canada et E.-U., 115 \$. Les publications antérieures, lorsque disponsibles, 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 corédactrices en chef. Nous invitons les lecteurs à nous faire part de leurs opinions. Toute correspondance devra être envoyée à l'ACITN, P.O. Box 10, 59 Millmanor Place, Delaware, ON NOL 1EO.

1-877-720-2819; Site web: www.cannt.ca

Le Journal ACITN accepte des articles (manuscrits) de façon continue.

Le journal ACITN 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 2291-644X (En ligne) ISSN 1498-5136 (Dans la presse)

Le journal ACITN est préparé par Pappin Communications The Victoria Centre, 84 rue Isabella, suite 2, Pembroke, Ontario K8A 5S5.

Rédacteurs en chef

Jovina Bachynski, RN(EC), MN-NP Adult, CNeph(C), (905) 845-2571 ext 6307 cannt.journal1@gmail.com

Matt Phillips, RN, BScN, MHS Work: (902) 473-7075 CANNT.journal2@gmail.com

diteur

Heather Coughlin, Pembroke, Ontario

Conception et design Sherri Keller, Pembroke, Ontario

Publicité

Heather Coughlin, Pappin Communications 84 Isabella St., Unit 2, Pembroke, ON K8A 5S5 T: (613) 735-0952; F: (613) 735-7983 email: heather@pappin.com rate card: www.pappin.com

2015-2016 CANNT BOARD OF DIRECTORS/ CONSEIL D'ADMINISTRATION DE L'ACITN 2015-2016

President/Président: Anne Moulton, RN, BScN, MN, CNeph(C) T: 905-522-1155 ext. 33916 CANNT.president@gmail.com

President-Elect/Présidente-Élue: Heather Dean, RN, CNeph(C) T: 403-943-9400 CANNT.presidentelect@gmail.com

Website Coordinator, Treasurer/ Trésorière coordonatrice du site internet: Melanie Wiggins, RN, CNeph(C) T: 705-325-0568 email/courriel:

CANNT.webtreasurer@gmail.com

Vice-President of Technologists/
Vice-Président des Technologues:
José Lloyd
T: 705-325-2201 ext. 3288/6288
email: CANNT.vptechnology@gmail.com

Atlantic Region Vice-President/ Vice-Présidente de l'Atlantique: Cathy Cake, RN, BN, CNeph(C), MN, MEd T: 709-777-3704 CANNT.vpatlantic@gmail.com

Quebec Vice-President/ Vice-Présidente du Québec: Nancy Filteau, RN, CNeph(C), BScN, MSc(A) T: 514-934-1934 ext. 35098

email/courriel: CANNT.vpquebec@gmail.com

Ontario Region Vice-President/ Vice-Présidente de l'Ontario : Billie Hilborn RN, CNeph(C), BScN, MHSc T: 416-480-6100 ext. 7960 CANNT.vpontario@gmail.com

Western Region Vice-President/ Vice-Présidente de l'Ouest: Janice MacKay, RN, CNeph(C), CCRP T: 403-955-6387 e-mail: CANNT.vpwestern@gmail.com

Journal Editors/ Les rédacteurs en chef: Jovina Bachynski, RN(EC), MN-NP Adult, CNeph(C), T: 905-845-2571 ext. 6307 cannt.journal1@gmail.com

Matt Phillips, RN, BScN, MHS T: 902-473-7075 CANNT.journal2@gmail.com will be powered by the patient's own heart. Read more about the project at http://www.nephrologynews.com/implantable-artificial-kidney-project-making-progress/

It is widely agreed that education is the most effective means that society possesses for confronting the challenges of the future. Progress increasingly depends upon the products of educated minds for research, invention, innovation, and adaptation. If you have not already attained the Canadian Nephrology Nurses Certification, CNeph(C), through the Canadian Nurses Association, now is the time to consider applying to write the exam. For the initial exam, the online application period is April 11 to August 8, 2016. The online

exam is available from September 19 to October 7, 2016. The online application period for renewals by exam is from April 11 to August 8, 2016, and between April 11 and November 30, 2016, by continuous learning.

If you are passionate about nephrology, enjoy volunteer work, and have some spare time, please consider applying for a CANNT Board position! We have several positions available for this coming election and encourage you to consider becoming involved in your specialty organization. We look forward to your application and meeting you!

Until next season, Anne Moulton CANNT President

LE MOT DE LA PRESIDENTE : ANNE MOULTON

Le mot de la présidente

Le printemps nous permet de constater que la vie est véritablement un éternel recommencement, une occasion de tous les instants, un printemps sans fin. Après un hiver passablement mouvementé et un début de printemps ponctué de retours de la saison froide, des Prairies aux provinces de l'Atlantique, la saison des activités et des occasions nommée printemps a finalement pointé le bout de son nez. Toutefois, l'arrivée du printemps ne signifie pas que l'automne sera une saison d'abondance. Pour que la récolte soit bonne, nous devons semer nos graines au printemps, c'est-à-dire profiter des occasions que cette saison nous offre.

Notre conseil d'administration continue de souligner, d'une saison à l'autre, l'excellent travail réalisé en soins infirmiers et en pratique technique dans le domaine de la néphrologie partout au Canada. Depuis la dernière édition du journal, le conseil a cité de nombreuses activités et de nombreux événements, changements novateurs dans la pratique et défis liés au travail en néphrologie. Son dévouement à l'ACITN et son engagement envers la pérennité de notre organisme sont incomparables.

Le gouvernement du Québec planche actuellement sur un plan provincial de réorganisation du programme de prise en charge de la néphropathie chronique afin d'harmoniser davantage les soins offerts en se basant sur le travail accompli en Colombie-Britannique et en Ontario. Chaque centre hospitalier doit concevoir un plan s'étalant sur 3 ans qui décrira les processus choisis pour atteindre les nombreux objectifs établis par le ministère de la Santé, objectifs qui visent l'adoption d'une nouvelle vision de la prise en charge de la néphropathie chronique. D'ailleurs, le principal sujet de discussion du congrès de la Société québécoise de néphrologie, qui a eu lieu en mars, a été le plan d'orientation en néphrologie que le ministère prévoit adopter pour le Québec.

En Ontario, le comité de planification du congrès national de l'ACITN, de concert avec les organisateurs de conférences, travaille avec diligence au fil de rencontres régulières pour organiser un congrès des plus excitants et informatifs. Celui-ci aura lieu à London, en Ontario, du 27 au 29 octobre. Restez à l'affût pour obtenir de plus amples renseignements

concernant cet événement au cours des prochains mois!

En collaboration avec le Réseau rénal de l'Ontario, les responsables de programmes de soins rénaux sont en train d'élaborer une stratégie intégrée visant à s'assurer que tous les patients ontariens atteints de néphropathie chronique auront continuellement accès à des soins palliatifs en néphrologie basés sur les meilleures pratiques. Cette initiative a pour but d'améliorer le processus d'orientation vers les soins palliatifs des patients souffrant d'insuffisance rénale terminale, d'accroître la formation en soins palliatifs offerte aux professionnels de la santé en néphrologie et de renforcer le partenariat entre les centres de soins palliatifs et les autres services de soutien communautaires en soins palliatifs au sein de la province.

Le comité provincial chargé d'assurer la qualité des soins en hémodialyse prodigués en ColombieBritannique a récemment émis de nouvelles lignes directrices fondées sur des données probantes dans le but d'harmoniser les soins en hémodialyse à l'échelle de la province. Deux de ces lignes directrices sont maintenant disponibles sur le site Web de la BC Renal Agency www.bcrenal.ca. De plus, la BC Renal Agency a présenté en mars dernier sa conférence annuelle intitulée Western PD Days. Cet événement s'est déroulé pendant deux jours et a souligné les innovations et les succès en dialyse péritonéale au sein des quatre provinces de l'ouest du Canada. Une nouvelle étude publiée dans la revue de l'American Medical Association (JAMA) en janvier 2016 a confirmé l'importance à l'échelle internationale du travail mené par le Dr Navdeep Tangri, chercheur et néphrologue à Winnipeg, en collaboration avec le Manitoba Renal Program. Le Dr Tangri a conçu un modèle de prédiction du risque d'insuffisance rénale.

Le comité de dialyse de la Canadian Standards Association (CSA) est en train de réviser les normes actuelles couvrant l'ensemble des modalités relatives à la dialyse et d'en concevoir de nouvelles. Le Groupe CSA est

un organisme sans but lucratif, tout comme l'ACITN, dont les opérations sont menées par des bénévoles qui ont à cœur d'élaborer les meilleures normes de pratique technique et de sécurité relatives à la dialyse. Des avancées techniques en soins rénaux ont fait les manchettes dernièrement. Le projet de « rein artificiel implantable » a progressé. Ce dispositif utilise des micropuces jouant le rôle de filtres et des cellules rénales vivantes, et est activé par le cœur du patient. Pour de plus amples renseignements sur ce projet, veuillez cliquer sur le lien suivant : http://www.nephrologynews.com/implantable-artificialkidney-project-making-progress/

La plupart des gens s'entendent sur

le fait que l'éducation est le meilleur atout dont dispose une société pour affronter les défis qui se présenteront à l'avenir. Le progrès dépend plus que jamais d'esprits éduqués pour que la recherche, les inventions, l'innovation et l'adaptation puissent prendre forme. Si vous ne possédez toujours pas votre certification en néphrologie de l'ACITN (CNéph[C]), il est grand temps de soumettre votre candidature pour passer l'examen. La période d'inscription en ligne à l'examen initial se déroule du 11 avril au 8 août 2016. L'examen en ligne sera accessible du 19 septembre au 7 octobre 2016. La période d'inscription en ligne pour l'examen de renouvellement se déroulera du 11 avril au 8 août 2016 et du 11 avril au 30 novembre 2016 pour la formation continue.

La néphrologie vous passionne? Le bénévolat vous interpelle? Vous disposez d'un peu de temps libre? Nous vous invitons à soumettre votre candidature pour un poste au sein du conseil d'administration de l'ACITN! Plusieurs postes seront disponibles lors des prochaines élections et nous vous encourageons à vous investir au sein de notre organisme spécialisé. Nous sommes impatients de recevoir votre candidature et de vous rencontrer!

À la saison prochaine, **Anne Moulton** Présidente de l'ACITN

CANNT REPRESENTATIVES/ CONTACTS; REPRÉSENTANTS/ CONTACTS ACITN

CNA Liaison/Liaison pour AIIC: Anne Moulton, RN, BScN, MN, CNeph(C) T: 905-522-1155 x33916 amoulton@stjosham.on.ca

Kidney Foundation of Canada, MAC Representative/Fondation du rein-Comité de médical consultatif: Anne Moulton, RN, BScN, MN, CNeph(C) T: 905-522-1155 x33916 amoulton@stjosham.on.ca

Bursary Committee/ Comité des Bourses: Anne Moulton, RN, BScN, MN, CNeph(C) T: 905-522-1155 x33916 amoulton@stjosham.on.ca

CANNT Administrative Office/ Bureau National de l'ACITN: PO Box 10, 59 Millmanor Place Delaware, ON NOL 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

2016 Symposium: October 27-29, 2016 London, Ontario Heather E. Reid, ARCT, MSc Principal Planner & Owner Innovative Conferences & Communications PO Box 319, 59 Millmanor Place Delaware, ON NOL 1E0 T: 519-652-0364 F: 519-652-5015 Email: hreid@innovcc.ca Website: www.innovcc.ca

Journal advertising contact/Personne contact pour la publicité du Journal: Heather Coughlin Pappin Communications, 84 Isabella Street, Pembroke, ON K8A 5S5 T: 613-735-0952; F: 613-735-7983 email/courriel: heather@pappin.com rate card: www.pappin.com

CANNT: Your Board in Action

ANNA 47TH NATIONAL SYMPOSIUM MAY 1-4, 2016, LOUISVILLE, KENTUCKY

Congratulations to the Planning Committee and the ANNA Board of Directors for hitting it out of the park! This is appropriate given the venue, Louisville, Kentucky, the birth place and home of the Louisville Slugger. Did you know each major league baseball player receives two pink baseball bats on Mother's Day? One is given to the player's mother and the second bat is for game use, autographed, and then given for charity auction. All the proceeds go towards breast cancer research.

One cannot think of Louisville without thinking of the Kentucky Derby, dubbed as "the most exciting 2 minutes in sports". The first Kentucky Derby took place in 1875, giving it the status of being the oldest, continuously-run sporting event in America. The winning horse is draped with a blanket of 554 roses. The mint julep is the official drink of the derby featuring Kentucky bourbon. The derby hats, for both men and women, are the crowning glory. The hats range from fascinators, to top hats, and literally everything in between. It is believed a hat would bring you a lucky bet! Secretariat holds the record time of 1:59.4 from 1973.



Heather Dean with Dr. Victor Gura, inventor of the Wearable Artificial Kidney.



Heather Dean at the ANNA Conference.

The National Symposium was packed with interesting choices of concurrent sessions. I had a difficult time deciding which ones to attend. Fortunately, all the sessions were made available on the ANNA app and website. Several of the sessions were recorded and can be viewed on the ANNA website.

In Kentucky Derby style, here is my triple crown of educational sessions: learning, leading, connecting.

Learning/Leading/Connecting

LEARNING: "Liver-Kidney Connection" by Kamrin Macki, FNP, and Kristin M. Larsen, MSN, RN, ANP, GNP, CNN.

This session discussed liver failure and the impact on kidney function. The session also provided information about caring for patients with both liver and renal failure. The style of presentation was excellent. Kamrin and Kristin shared their knowledge of the liver and kidney, respectively. The "Ping-Pong presentation" was both entertaining and engaging.

LEADING: "The Wearable Artificial Kidney: 1 Year Later" by Dr. Victor Gura, MD, FAS inventor of the Wearable Artificial Kidney(WAK).

Dr. Gura spoke about why he invented the artificial kidney, the science behind how it works, what they have learned since completing the first human trials, and its future direction. Amazing!! I encourage watching the YouTube videos on WAK. The reactions of the trial participants are priceless.

Nancy Colobong Smith, MN, ANP-BG, CNN, ARNP, presented about the human 24-hour trials and how they were set up from start to finish. Dr.Gura recognized the dedicated work of his entire team. It was a pleasure to meet them both.

CONNECTING: "The New Graduate: Training and Retaining in the Nephrology Setting" by Kyra Trappett, BSN, RN, CNN.

Kyra discussed the needs of new graduates, orientation versus mentorship, and the successful integration of the new nephrology nurse. I am very happy to report the future is looking bright with young nephrology nurses like Kyra!!

In summary, it does not matter on which side of the border you live and work. Nephrology health care professionals strive to provide the best possible care for patients and families living with kidney disease. Symposia such as Kentucky provide a stage to showcase all the great work being done.

Yours in Nursing, Heather Dean, RN, CNeph(C) President-Elect (2015–2016) Canadian Association of Nephrology Nurses and Technologists



OCTOBER 27-29 LONDON, ONTARIO





OCTOBER 27-29 LONDON, ONTARIO

This year's conference promises nephrology professionals—nurses, technologists, administrators, researchers, pharmacists, and more—many opportunities to learn, share, network, discuss, and socialize together.

Experience all that CANNT 2016 has to offer:

- Share in the plenary addresses: Be inspired towards peak performance, re-affirm your call to your profession, and incorporate leading-edge science into your everyday work!
- Choose from concurrent sessions and workshops suited to all interests... with topics ranging from mental health, pregnancy, geriatric nephrology, innovations in practice, technology, research, and much, much more.
- Learn from poster presentations with contributing authors from across Canada!
- Engage with our corporate partners as they showcase their latest products and services. Come prepared with questions and issues—our exhibitors want to hear from you!

Immerse yourself in this year's conference theme, "CHANGING THE FACE OF TOMORROW", recognizing the untapped capabilities of both your patients and yourselves. Explore innovative strategies for changing the face of tomorrow!

Hosted at the beautiful London Convention Centre, this conference will re-energize, motivate, and engage you!

Register today! CANNT 2016 information is available at www.cannt.ca

We are excited to welcome Canadian nephrology professionals to London, Ontario! Come and join us!

ABSTRACTS

Some of the key strategic goals of CANNT are to disseminate educational materials to CANNT members, profile scientific research, and provide opportunities for nephrology colleagues to network.

CANNT's national conference, **CANNT 2016**, provides an excellent venue for accomplishing these goals; however, only a portion of CANNT members are able to attend the national conference annually. Cognizant of this, CANNT is pleased to print the abstracts to be presented in both oral and poster format at this year's annual conference in this issue of the *CANNT Journal*.

The following abstracts celebrate the diversity of nephrology topics being investigated and discussed across Canada. It is our hope that CANNT members interested in pursuing a profiled topic will contact our national office at 519-652-6767, 1-877-720-2819, or **cannt@cannt.ca** to receive information regarding how to contact the author about their work. We hope you will carefully review these abstracts!

Jovina Bachynski and Matt Phillips Co-Editors, CANNT Journal

Improving Vascular Access Patient Outcomes: Attributes of Fistula Cannulation Success

Lori Harwood, PhD, RN(EC), CNeph(C), Barbara Wilson, MScN, RN(EC), CNeph(C), Abe Oudshoorn, PhD, RN, London, ON

Cannulation of the arteriovenous (AV) fistula requires significant skill development and refinement and, if not done well, can have negative consequences for the patient and nurse. The nurses' approach, attitude, and skill with cannulation greatly impacts on the experience. Complications from miscannulation or an inability to needle fistulas can result in the increased use of central venous catheters. Some nurses remain in a "perpetual novice" state, resulting in a vicious cycle of negative patient consequences (bruising, pain) further influencing patients' decisions not to pursue a fistula or abandon cannulation.

The purpose of this qualitative study was to explore what attributes/activities contribute to successful cannulation. Such knowledge can be applied to interventions that promote proficiency, change, and skill development. An organizational development theory (appreciative inquiry) and research method were used. Eighteen hemodialysis nurses who self-identified with performing successful cannulation were interviewed. The interviews were audio recorded and were transcribed verbatim. The data were analyzed using content analysis.

Four common themes representing successful fistula cannulation emerged: patient-centred care, teamwork, opportunity and skill, and nurse self-awareness. Successful cannulation is more than a learned technique to correctly insert a needle; rather, it represents contextual influences and interplay between the practice environment and personal attributes.

Practice changes based on these results may improve cannulation, decrease complications, and result in better outcomes for patients. Efforts to nurture positive patient experiences around cannulation may influence patient decision-making regarding fistula use.

Transitioning Our Youth: It's a Team Approach!

Zoe Levitt, MSW, RSW, Anna Gozdzik, MN, RN, CNeph(C), Toronto, ON

With advances in modern medicine, more young adults with chronic kidney disease (CKD) are transitioning into the adult health care system. Unfortunately, adult health care professionals do not fully appreciate the unique psychosocial and developmental needs of this population. The literature cites that these needs must be addressed by clinicians to ensure a successful transition (Sable et al., 2011). In an effort to understand these needs, the nephrology social workers at Toronto General Hospital (TGH) performed a literature review and an environmental scan of existing transition protocols, and collaborated with nephrology staff at the Hospital for Sick Children (HSC). They also performed a qualitative research project with patients/families who had already transitioned. These findings were presented to the Division of Nephrology at TGH and a consensus was

reached amongst the group to implement a transition protocol in conjunction with HSC staff. A CKD transition clinic was subsequently established between TGH and HSC. Both teams have since met with future patients and their families at HSC prior to transferring to TGH. Patients and families have provided feedback that this clinic is invaluable in assuaging their fears and concerns. They also appreciated the opportunity to meet the receiving team. Additionally, face-to-face transfer of care discussions amongst both teams have allowed for a better understanding of biopsychosocial issues. To date, this initiative supports the importance of a transition clinic with this population.

REFERENCE

Sable, C., Foster, E., Uzark, K., Bjornsen, K., Cannobbio, M.M., Connolly, H.M., ... Williams, R.G., on behalf of the American Heart Association Congenital Heart Defects Committee of the Council on Cardiovascular Disease in the Young, Council on Cardiovascular Nursing, Council on Clinical Cardiology, and Council on Peripheral Vascular Disease. (2011). Best practices in managing transition to adulthood for adolescents with congenital heart disease: The transition process and medical and psychosocial issues: A scientific statement from the American Heart Association. *Circulation*, 123(13), 1454–1485. doi:10.1161/CIR.0b013e3182107c56

The Development of National Living Donor Assessment Guidelines

Ruth McCarrell, BSN, RN, CNeph(C), Vancouver, BC, Maureen Connelly, BScN, RN, Toronto, ON

Purpose: As two of the contributing authors on "Kidney Paired Donation Protocol for Participating Donors 2014" (Richardson et al., 2015), we will report on our work with the national Living Donor Advisory Committee (LDAC) and the development of guidelines for all living kidney donors participating in the national Kidney Paired Donation Program.

Background: Canadian Blood Services formed the LDAC group with the goals of:

- Developing standardized practice for the evaluation and acceptance of living donors
- Streamlining the review and acceptance of donors nationally
- Decreasing the number of proposed chains in the Kidney Paired Donation Registry that collapse. (Historically, chains frequently collapsed due to differing standards for donor acceptability amongst various donor programs.)





Methods: Subcommittees were struck to write the recommendations and supporting documents. Literature reviews were undertaken including review of other international guidelines. Reviews of current donor acceptability and testing from all Canadian donor programs were completed. Consensus meetings took place to review all the committee recommendations and to harmonize practice.

Implications for practice: With publication of the guidelines, all donor programs participating in the Kidney Paired Donation Program will be expected to adopt the guidelines into clinical practice. The guidelines provide a framework for an extensive donor evaluation to determine donor low risk of disease transmission to the organ recipient, and the safety of the potential donor will not be overlooked in the desire to optimize living donor transplants. With a standardized process, fewer chains should collapse. Program efficiencies should be improved when sharing files nationally.

REFERENCE

Richardson, R., Connelly, M., Dipchand, C., Garg, A.X., Ghanekar, A., Houde, I., ... Landsberg, D., for the Protocols Working Group of the Canadian Blood Services' Living Donation Advisory Committee. (2015). Kidney paired donation protocol for participating donors 2014. *Transplantation*, 99(10S-1), S1-S31.

Celebrating Our Team Success

Michelle Masson, RN, CNeph(C), Woodstock, ON, Carolyn Mack, RN, CNeph(C), London, ON

This is a case study documenting the complicated journey of a young chronic renal failure patient through our renal program. The diagnosis of chronic illness is significant at any time, but can be devastating in the adolescent years. Aside from the daily struggle of living with chronic illness, trying to find your direction can be challenging, if not overwhelming. Through patient-driven goal setting and multidisciplinary team involvement, we have many small successes to celebrate.

Join us on the journey!

Follow-Up Education Day: Supplement to Nursing Orientation in the Hemodialysis Unit

Carolyn Bartol, RN, BScN CNeph(C), Colleen Wile, RN, BScN CNeph(C), Halifax, NS

The Nova Scotia Health Authority—Central Zone employs Licensed Practical Nurses (LPNs) and Registered Nurses (RNs) to provide care to the patient receiving hemodialysis in satellite and in-centre unit settings.

Nursing orientation to the hemodialysis unit takes place over a six-week period, with training in both the classroom and clinical settings. After this initial orientation, the nurse is expected to be independent in the care of the patient receiving hemodialysis, at the novice level.

Feedback from novice staff indicated that nurses were overwhelmed by the intensive learning timeline and the technology. The implementation of new graduate nurses into the dialysis setting highlighted this as well. The need to consolidate the patients' needs with the technological aspects of their care led to development of a supplemental education day. The day was provided to all nursing staff after approximately six months' employment in the hemodialysis unit.

This presentation will describe the development process, agenda content, evaluative process, and perceived benefits derived from exposing all hemodialysis nursing staff to this education. Benner's (1984) from novice to expert theory will provide the framework to describe the development and evaluation process used in the implementation of this very successful initiative.

REFERENCE

Benner, P.E. (1984). From novice to expert: Excellence and power in clinical nursing practice. Menlo Park, CA.

THE RETIREMENT MAP! Destination Unknown: Are You Prepared? Facing Your Future: Work Hard, Retire and Live Happily Ever-after!

Frances Boone, RN, London, ON

Are you considering retirement? We tend to resist the process, as the time approaches. The baby boomer generation is aware that sooner or later the decision to retire will be made. Do you have a plan? There are many challenges to consider: health concerns; will I outlive my savings; will my pension be enough; return to work; volunteer; or travel. Once the financial portion is completed, the transition begins. To successfully retire, it is important to discover new opportunities that will complement your skills and experience.

After the retirement party is over, the challenges come to the surface. The destination is uncertain ('I am the captain of my own ship'). Several strategies are required to navigate through the muddy waters of retirement and create a positive transition. After leaving the secure work environment of routine, order, and support, it is now more important than ever to find a new approach to keep the same level of routine and balance. In preparation for this

new life cycle, with a life coach, a vision board was created to see the big picture and a daily journal was used for inspiration!

The face of the future is different for everyone. It is never too early to begin a plan. The ultimate goal is to stay healthy and happy for the long haul. We are retired nephrology nurses and these are our personal experiences and strategies to share.

To quote Florence Nightingale: "If your experiences would benefit anybody, give them to someone."

Mortality in Chronic Kidney Disease: Is There a Precise Nutritional Indicator?

Jennifer Pereira, BSN, RN, Katharine Douaihy, PhD, CRNP, New Bedford, MA

Current knowledge of the mechanisms leading to increased risk of death in the chronic kidney disease (CKD) population is incomplete. The purpose of this integrative review was to determine the precise link between nutritional indicators and mortality in the CKD population. Eligible studies consisted of prospective cohort, longitudinal, case-control, randomized control, and cross-sectional analyses. Clinical journals were explored along with a database search that included CINAHL, MEDLINE, Cochrane, Dynamed, and PubMed. Key word and controlled vocabulary searches included the following terms: albumin, phosphorus, mortality, chronic kidney disease, mineral bone disease (MBD), calcium, intact parathyroid hormone (iPTH), C-reactive protein (CRP), and protein energy wasting. Timeframe was isolated to articles of primary sources published since 2010. The initial search yielded more than 86 articles. The remaining isolated articles were a combination of longitudinal, descriptive, observational, prospective cohort, cross-sectional, and quantitative studies. Data were collected from a total of 20 countries and included a timeframe from 1948-2015. Evidence to support using albumin as an absolute indicator for mortality is lacking. Findings of this review suggest the use of various indicators for assessing mortality risk in the CKD population. The continued use of a single indicator should be discouraged; instead, a full spectrum of variables should be considered. Confounding variables such as fluid overload and metabolic variations should not be overlooked when evaluating patients. Early treatment with vitamin D analogues in raising vitamin D levels greater than 30ng/ml can potentially reduce the fatal events that occur secondary to MBD. The heavy reliance on serum albumin as a clinical tool is unwarranted, and the strategy of supplying expensive nutritional supplements as a reflexive first step in managing hypoalbumemia should be discouraged. Much needs to be learned about the assessment and the impact of deranged phosphate homeostasis in early CKD stages. Composite measures of serum phosphate, fractional phosphate excretion, and FGF23 may need to become an integral component in therapeutic decision-making.

High Flow Cardiac Output Failure

Cheryl Carleton, RN, Medicine Hat, AB, Jo-Anne van Rootselaar, BScN, RN, Calgary, AB, Arleen Avendano, RN, CNeph(C), Calgary, AB, Marlene Sullivan, RN, Calgary, AB

Since the inception of access flow monitoring, the renal community has had the benefit of early recognition and intervention of dysfunctional arteriovenous fistulas (AVF). While high fistula flow with progression to cardiac failure is not common, it does occur and can be a very serious complication. What constitutes a high flow? Literature suggests flows greater than 2 litres per minute (L/min) significantly increase the risk of cardiac failure. MacRae, Levin, and Belenkie (2006) from the University of Calgary report that the ratio between access flow and cardiac output is an important clinical indicator. Access flows exceeding 25% of cardiac output may indicate a potential problem, whereas flows greater than 30% should undergo further testing. Physical assessment will assist in diagnosis. However, symptoms are often overlooked, as they are similar to that of the fluid overloaded renal patient. Emphasis needs to be placed on AVF flow/cardiac output ratio, assessment, and further diagnostic testing. Is there a specific AVF that is more frequently affected? Yes, upper arm AVFs are associated with an increased risk of high-output cardiac failure. Treatment may range from routine monitoring to surgical intervention, such as banding or ligation. In conclusion, staff must be educated so diagnosis and treatment occur prior to permanent cardiac damage or compromise.

REFERENCE

MacRae, J.M., Levin, A., & Belenkie, I. (2006). The cardiovascular effects of arteriovenous fistulas in chronic kidney disease: A cause for concern? *Seminars in Dialysis*, 19(5), 349. doi:10.1111/j.1525-139X.2006.00185.x





Medical Technology and Its Impact on the Dialysis Patient

Rebecca Rowland, RN, Michelle Pepper, DUA, Carolyn Pecan, RN, Julie Anne Lawrence, MScN, RN(EC), CNeph(C), London, ON

Dialysis is a highly specialized life-sustaining treatment that inherently relies on technology. Not surprisingly, technology and information systems have also been introduced in order to enhance the care we provide to patients who receive dialysis in a satellite unit one hour away from our host hospital. In a satellite hemodialysis unit in Southwestern Ontario, nursing staff wished to review how new technology, through Ontario Telehealth Network (OTN) and iPads, has impacted the care and satisfaction of our hemodialysis patients. The clinical question was to better understand how our patients and families valued receiving dialysis closer to home and how outreach technology could further enhance their care. Fourteen patient surveys were completed from a patient population of 26—a response rate of 53%. Responses included: (1) less travel time and decreased travel costs; (2) better nutrition being closer to home; (3) quieter setting due to smaller size; and (4) more time to participate in social activities. Highlighted in these responses was the desire to have more time with the Allied Health Team from the host hospital (one hour away). From this project, iPad technology and bi-weekly OTN clinical conferences are technological aspects to enhance patient/family care. Evaluation of this endeavour in the future will include a post survey inquiring if the technological measures have enabled patients and their families to have better access to the Allied Health Team. Ideally, we hope to provide evidence of the value of this technology tool to enhance patient satisfaction and improve outcomes by the ability to have real-time access to the care team.

Discussions with Patients on Hemodialysis About End-of-Life Care Wishes

Sandra Asare-Kwakye, BScN, RN, Ancaster, ON

Initiating and engaging in discussions with patients about death, dying, and personalized end-of-life (EOL) treatment goals, referred to as Advance Care Planning (ACP), is an essential and ethical dimension of health care that has particular relevance for nurses working in hemodialysis (HD) settings. While speaking with patients on HD

about their code status and EOL health care wishes, they were very candid with sharing their fears and worries about death and dying and their future health care wishes with me. Patients wanted to know the choices available to them in the event they were unable to make future health care decisions in anticipation of declining health. I recognized that many patients had not shared their EOL wishes with their loved ones and/or their health care team.

Research on ACP specific to the chronic kidney disease population, and my experiences having ACP discussions with patients on HD, were shared with my nursing colleagues to elicit their thoughts on having these sensitive discussions with our patients. Additionally, a focus group with the nephrology advance practice nurses in our HD program was conducted to better understand nurses' attitudes, views, and beliefs preventing HD nurses from engaging patients in death and dying discussions and ACP. Through a poster presentation, I will demonstrate the need to change the face of nursing care in a highly specialized and technical HD environment to include death and dying dialogue with patients on dialysis as part of our daily routine care.

The History of Dialysis Technology in Relation to Improvement in Patient Outcomes

Clarence Graansma, Charge Renal Technologist, Kitchener, ON

The technology of hemodialysis has improved dramatically over the last 30 years. This presentation provides an overview of these changes and correlates the technology change to improvements in the capabilities of clinicians to provide better therapies that have reduced the morbidity and mortality related to hemodialysis therapy.

There will be a basic description of the capability of hemodialysis machines in relationship to what a real kidney does. The following topics will then be covered:

- Equipment, safety, reliability, and improvements in fluid and systems control
- · Changes in the types of buffers used
- Historical problems with water treatment and the improvements that have been made
- Dialyzer membrane efficiency and biocompatibility improvements over the years
- Adequacy measurement methods and its relationship to equipment capabilities.

I will then discuss how the improvements in one area of technology often require greater improvement in other areas. For example, high-efficiency dialyzers require better water quality, more physiological buffers, more accurate and reliable equipment, and better accesses to achieve their full clinical benefits.

I will then discuss some of the newer technologies available today. Many clinicians are reluctant to push ahead with using some of the new technologies because in the past there have sometimes been problems when one area of technology advanced faster than the other supporting technologies, and patient outcomes did not improve as expected.

Ontario Renal Network Palliative Care Report: Recommendations Towards an Approach for Chronic Kidney Disease

Vanita Jassal, MD, Toronto, ON, Marnie MacKinnon, BPE, Toronto, ON, Peter Blake, MD, MB, FRCCP, London, ON

Purpose: Symptom control and palliative care are increasingly being recognized as important to patients, their families, and to health care personnel. The need for better delivery of palliative care is increasingly being emphasized through reports such as the Auditor General of Ontario's 2014 Report, and in Kidney Disease: Improving Global Outcomes' (KDIGO) recommendations for palliative care within chronic kidney disease (CKD). With this in mind, the Ontario Renal Network (ORN) identified palliative care as a priority in its Ontario Renal Plan II (2015–2019).

Methods: The ORN convened a multidisciplinary committee including patients, families, and health care stakeholders to further the provincial palliative care work within nephrology while addressing the unique palliative care needs of people with CKD. The ORN Palliative Care Report presents these findings.

Results: The report summarizes evidence reviews and findings from a recent Ontario analysis of CKD patients, suggesting high emergency department and intensive care unit admission rates in the last 14 days of life, and the impact of palliative care on end of life within CKD. Incorporating findings from regional and provincial consultations and patients and family interviews, the committee developed a framework and six recommendations to advance high-quality, integrated palliative care in Ontario for people living with CKD over the next four years, regardless of the chosen treatment modality.

Implications for nephrology care: The recommendations will support a collaborative and continuous approach to palliative care, focusing on education, system accountability, shared understanding of palliative care in CKD, ongoing support for advance care planning, and standard care models.

A Renal Mentorship Program: Forging Nursing Leaders for Tomorrow

Melinda Daamen, BScN, RN, Michele Spurgeon, BScN, RN, Kitchener, ON

The renal program at Grand River Hospital (GRH) has implemented a voluntary mentorship program to address the recent influx of new staff members and nursing retention. The Peers Encouraging Empowerment in Relationships (PEER) program was created in the interest of empowering and nurturing nursing leaders through the use of mentorship and leadership. The need for a mentorship program was validated by the Healthy Workplace and Environments (HWE) committee as a way to invest in the nephrology nurses. PEER is based on a foundation of resonant leadership and the application of power mentoring and e-mentoring. This research-based initiative was developed and put into practice by two

staff nurses (mentorship champions) along with the support of the HWE committee, unit manager, and feedback from unit staff. The mentorship program incorporates the Ontario Renal Plan 2 by the Ontario Renal Network (ORN), including identifying nurses as valuable key stakeholders. Minimal cost was involved and mainly consisted of committee time for the mentorship champions and a one-hour presentation for the participants. Since PEER was launched in March 2015, 57% of the nurses in the unit are voluntarily participating. Increased competency, communication, morale, motivation, confidence, critical thinking, and an increased sense of community are anticipated results of the program. The most recent results of a hospital-wide employee engagement survey highlighted the renal program as the most improved unit. PEER has generated interest throughout the hospital and there are intentions of adapting the program to fit the needs of other units.

Enhancing Adult Education Through Humour

Michele Ivanouski, RN, CNeph(C), Denfield, ON

As renal function declines, patients will encounter the five stages of renal disease. At London Health Science Centre (LHSC), patients in Stages 1 and 2 require care from a nephrologist in a general nephrology clinic. Once in stage 3, patients will transition to the Chronic Kidney Disease (CKD) clinic. The CKD team includes a dietitian, social worker, pharmacist, physiotherapist and nurse case manager (NCM). All CKD team members build on the patient's base knowledge with more intense education being offered by their NCM. Their stage of readiness can be determined by one-on-one education. NCMs employ the rules of adult education in the small group classes, which can reveal coping techniques or struggles. Ideally, at stage 4, they will be asked to choose a renal replacement therapy (RRT) so that plans for vascular access and/or transplant work-up can be initiated. Before choosing, they need to understand each appropriate RRT so that an informed decision can be made as they approach stage 5 (end-stage renal disease [ESRD]). The appropriate use of humour during this most vulnerable time has helped many patients and families visualize their future when choosing RRT, transplant, or conservative management.

This poster presentation will follow patient cases. It will explore humour's effect on the learning curve. My findings about the use of humour with patient education will be shared. This presentation will express my optimism that humour can enhance the face of patient educators tomorrow.





Association of Bone Mineral Density With Fractures Across The Spectrum of Chronic Kidney Disease— The Prairie DXA Study

Shelley Giebel, MN, RN (NP), Bhanu Prasad, MD, Jennifer St. Onge, PhD, Regina, SK

Introduction: The value of dual energy x-ray absorptiometry (DXA) scans in postmenopausal women in predicting fractures is robust. However, its role in patients with chronic kidney disease (CKD) stages III to V is controversial.

Methods: Four hundred and ten consecutive patients who underwent DXA scan at the point of entry into our multidisciplinary CKD program were included. Bone mineral density (BMD) data, T score, and Z scores were collected at four sites: lumbar spine, total hip, mean of left and right femoral neck, and the proximal radial region (radius 33%). We collected data on demographics, and lab markers of mineral metabolism and fractures (identified through self-reported questionnaires, hospital electronic medical records, and physician billing records).

Results: Approximately 36%, 28%, and 32% of patients in stages III, IV, and V CKD, respectively, experienced a clinical fracture during the study period. On multivariate analysis, we observed that a decline of 1.0 SD in T-score is associated with a statistically significant increase in the risk of fracture after addition of biochemical parameters such as parathyroid hormone (PTH), alkaline phosphatase (ALP), calcium and phosphorus, and estimated glomerular filtration rate (e-GFR) of less than 30 mL/min (OR = 1.36, 95% CI: 1.02, 1.72). In patients with a GFR of greater than 30 mL/min, the odds ratio (OR) of identifying a fracture was 1.54 in comparison to OR of 1.14 in patients with GFR less than 29 mL/min.

Conclusions: We conclude that there is a role for DXA scans in all patients with CKD, although the ability of the T scores to predict fractures is more robust in stage III CKD, as compared to stages IV and V.

Early Mortality on Continuous Renal Replacement Therapy (CRRT): Prairie CRRT Study

Shelley Giebel, MN, RN (NP), Bhanu Prasad, MD, Regina, SK

Background: Patients with acute kidney injury (AKI) requiring renal replacement therapy (RRT) have increased short-term and long-term risks of mortality. In most North American intensive care units (ICUs), these patients require continuous renal replacement therapy (CRRT). CRRT is resource-intensive and the natural history of patients requiring CRRT in the ICU is poorly understood.

Methods: We conducted a prospective cohort study of patients undergoing CRRT for AKI in three ICUs of the Regina Qu'Appelle Health Region (RQHR). We collected data on demographic, laboratory, and clinical measures, and followed patients from admission to the ICU up to nine months post discharge in the community.

Results: Of the 2,634 patients admitted to the ICUs in the study period (April 2013 to September 2014), (2,201/2,634) 83.6% had no AKI. Two hundred and sixty-nine patients (10.2%) had stage III AKI; of these, 106 patients (40%) were started on CRRT. Further, 66 of the 106 patients on CRRT died in ICU whilst on CRRT; of these, 17 patients (26%) died within 24 hours of initiating therapy. Patients who died within 24 hours had a higher FiO2 (0.8 \pm 0.2 versus 0.6 \pm 0.2, p = 0.011); higher epinephrine (32.0 \pm 29.9 versus 6.5 \pm 9.3, p = 0.005); higher norepinephrine levels (39.4 \pm 23.5 versus 19.6 \pm 14.2, p = 0.005) and lower pH (7.1 \pm 0.2 versus 7.3 \pm 0.1, p = 0.005) when compared to those who survived the first 24 hours of admission.

Conclusion: Patients admitted to the ICU with AKI requiring CRRT have a high risk of early mortality. In these patients, vasopressor use and hypoxia were independently associated with adverse short-term survival.

An Evaluation Through Partnerships: Looking at Peer Support for Patients Affected by Chronic Kidney Disease

Carolyn Ingram, BSc, RN, CNeph(C), London, ON, Nour Schoueri, PhD, Toronto, ON, Lisa Joya, MA, Toronto, ON, Julie Gilbert, PhD, Mississauga, ON, Jim O'Brien, Toronto, ON, Christina Vaillancourt, RD CDE, Oshawa, ON, Shirley Pulkkinen, MSW, RSW, Sault Ste. Marie, ON

Purpose: The Ontario Renal Plan II highlights the importance of peer support for individuals affected by chronic kidney disease (CKD), where people can connect with others who have been through similar experiences. The Kidney Foundation of Canada (KFOC) has been offering a peer support program to CKD patients, family members, and caregivers for many years. KFOC and the Ontario Renal Network (ORN) were interested in identifying ways to improve awareness of the program and participation in peer support. The purpose of this evaluation was to explore awareness, uptake, and use of the KFOC Peer Support Program in order to suggest recommendations for optimizing program utilization.

Methods: This project was a partnership between Cancer Care Ontario's division of Planning and Regional Programs, ORN, and KFOC in consultation with a project Steering Committee. Online and paper surveys were developed, advertised, and distributed to the 26 Regional Renal Programs in Ontario for dissemination to CKD patients and family members/caregivers. Surveys were available in English, French, Farsi, and traditional Chinese. Surveys focused on awareness of and experience with peer support. Semi-structured telephone interviews were conducted with KFOC and renal program staff, as well as peer support volunteers, focusing on a need for and access to peer support.

Results: More than 1,800 surveys and 15 interviews were completed across the province. Data analysis will be completed by March 2016.

Conclusions: The findings will be used to identify strategies for improved utilization of the KFOC Peer Support Program and its integration within the Ontario renal health system.

Medical and Non-Medical Predictors of Completing the Kidney Transplant Evaluation Process in Referred Chronic Kidney Disease Patients: A Single Centre Study

Vivian Tia, HBSc, Olusegun Famure, MPH, Med, CHE, Lee Anne Hyer, BScN, RN, CNeph(C), Yanhong Li, MSc, Franz Marie Gumabay, HBSc, Nicholas Phan, HBSc, Colleen Shelton, MHSc, RN, S. Joseph Kim, MD, PhD, MHS FRCPC, Toronto, ON

Purpose: This study aimed to evaluate medical and non-medical factors associated with progression through the kidney transplant evaluation process at our transplant centre.

Methods: We conducted a single-centre retrospective cohort study of 2,555 adult patients referred to our kidney transplant program between January 1, 2003 and December 31, 2012, with follow-up to December 31, 2013. We defined three time periods of the kidney transplant evaluation: (1) referral to first visit with the nephrologist (FN), (2) FN to final disposition (FD), and (3) from referral to FD. FD was defined as the time point when a patient's kidney transplant eligibility was finalized. Cox proportional hazards models were used to assess the factors associated with completing each step of the evaluation process.

Results: The median follow-up was 1.12 [IQR: 0.60, 2.10] years. Medical factors such as history of coronary artery disease or psychological complications were negatively associated with reaching FD from referral (HR 0.81 [95% CI: 0.70, 0.95] and HR 0.59 [95% CI: 0.44, 0.79], respectively). Referred pre-emptive patients tended to wait longer to reach FN compared to those on dialysis (HR 0.69 [95% CI: 0.60, 0.80]). Socioeconomic measures such as income and marginalization index showed no significant association with the completion of each phase of the evaluation process.

Conclusion: Comorbid conditions were the major drivers for increased time to completing each phase of the kidney transplant evaluation process in our transplant centre.

Implication for nephrology care: The prominence of medical factors as strong predictors of completing the kidney transplant evaluation process suggests that better coordination of medical investigations for such patients could facilitate work-up completion in a more timely way.

Patients' Perspective on the Kidney Transplant Evaluation Process—Preliminary Analysis at a Single Transplant Centre

Olusegun Famure, MPH, Med, CHE, Franz Marie Gumabay, HBSc, Nicholas Phan, HBSc, Sabina Freiman, HBSc, Colleen Shelton, MHSc, RN, S. Joseph Kim, MD, PhD, MHS, FRCPC, Toronto, ON

Purpose: Patient-, dialysis provider- and transplant centre-(TC) related factors may impede or enhance the progression of potential candidates through the transplant evaluation process (TEP). The TEP is often complex and may pose a challenge for candidates. The objectives of this study are to: (1) explore kidney transplant candidates' attitudes towards the pre-TEP, (2) highlight kidney-specific stages hindering the TEP, and (3) identify potential recommendations to improve the TEP.

Method: A self-reported cross-sectional survey was distributed to patients who were evaluated for transplant at an urban TC and received a decision regarding transplant eligibility up to one year before enrolment. The questionnaire comprised six domains including: (1) demographics, (2) pre-transplant assessment, (3) suitability consultations, (4) interventional consultations, (5) satisfaction with evaluation processes, and (6) improving your care.

Results: To date, 131 patients have completed the survey. Patients reported that the transplant team (95%) and general nephrologist (72%) provided sufficient information regarding transplantation. Sixty-nine per cent of the respondents stated that the time to complete evaluation tests was reasonable, whereas only 50% preferred to have medical diagnostic testing be completed at the TC. Forty per cent agreed that distance to the TC was an obstacle towards timely completion of their evaluation. Over a quarter of respondents (26%) expressed a need for more communication with pre-transplant coordinators.

Conclusions: Patients were generally positive about their pre-transplant experiences. Opportunities for improved communication between patients and the TC during the TEP need to be further explored.

Implications for nephrology care: Feedback received would support our efforts to better understand patient discernments regarding the TEP and deduce potential areas of improvement.





"Going Home and Staying There"—Retention of the Home Hemodialysis Patient at LHSC

Lynda King, RN, Sharon Kamphuis, BScN, RN, CNeph(C), London, ON

London Health Sciences Centre (LHSC) has provided a home dialysis program since 1971. Data were collected for patients who trained for the home program beginning in November of 1998 until March 2015.

During this time, 176 patients trained for home hemodialysis. Of these, 53 received transplants and 31 are deceased. Twenty-five transferred out of the program post one year of training. Six patients were unable to complete training. Two patients successfully completed training, but transferred out of the program within the first year. Fiftynine patients were active in the program as of March 2015.

Tools and concepts used in our program will be shared to assist the beginning practitioner with increased patient retention in home hemodialysis. The presentation will cover reasons for failure to determine if changes in practice could have improved outcomes.

Novice to Skilled: Advancing Vascular Access Skills Within a Novel Vascular Access Program

Annalisa Voskamp, BScN, MScN(c), RN, Hamilton, ON

As a hemodialysis (HD) nurse, advanced skills are essential to providing quality vascular access care. The process of developing these skills presents a challenge to novice HD nurses who, upon encountering a difficult access, traditionally look to a more experienced nurse to assume the role of cannulator. After achieving competency in assessment and cannulation of the well-established access, I expressed an interest in advancing my practice to include care of those considered high risk. Through the support of the vascular access coordinators, as well as an experienced team, I had the opportunity to enhance my assessment, cannulation, and problem-solving abilities. These experiences dramatically improved my skills, knowledge, and confidence, allowing me to care for challenging accesses presenting on the unit, a practice that might be considered taboo in a profession that values years of experience as an indicator of ability. After one year, an invitation to join the Hemodialysis Access Resource Team further supported my development. In my presentation, I will elaborate on the opportunities presented to me as a novice HD nurse working within an exceptional vascular access program. I will discuss implications of my experience

in the way we educate HD nurses of tomorrow, as leaders in the area of vascular access. Vascular access is considered a lifeline, and providing the best possible care is fundamental to a patient's well-being. In my two-and-half years working in HD, I have been able to establish myself as a valued resource to patients and staff.

No Patient Gets Left Behind—Monthly Multi-Disciplinary Rounds Held in an Effort to Clarify and Establish Care Plans Regarding Dialysis Modality and Dialysis Access for New Dialysis Starts

Janna Rousom, BScN, RN, Carolyn Ingram, BSc, RN, CNeph(C), London, ON

The importance of timely decision-making in regard to modality choice and access for new start dialysis patients cannot be overstated. At London Health Sciences Centre (LHSC), we are fortunate to have an invaluable multidisciplinary team that allows us to provide our patients with multi-faceted care. However, it also comes with its unique challenges. We have found that nurse practitioners (NP), nurse case managers (NCM), and social workers (SW) often liaise with patients, albeit in a siloed manner, with each focusing on his/her primary role with the patient. Patients often hear conflicting information from team members and find this frustrating and confusing.

In an effort to break down these silos, NPs and NCMs arranged a regular monthly meeting with a purpose to identify all new dialysis starts and communicate information regarding the scope of the person's CKD education and pre-dialysis planning regarding modality and access. Patients with a planned start and with the appropriate dialysis access are very quickly reviewed and taken off the list. Those patients with more complicated starts (i.e., started acutely without knowing a nephrologist or those who started from a kidney clinic without having modality or access plans) were reviewed more carefully. Patients who did not yet have a firm plan were left on the list and would be discussed at a later meeting in two to three months. As the multidisciplinary rounds "matured", there was an appreciation that SW support is critical in helping to identify or overcome barriers some patients have with decision-making or attending access or modality clinics. SW team members are regularly included, as well as home program and satellite staff.

This systematic multidisciplinary meeting has assured that all team members are aware of modality access plans and are sharing the same message with the patients. It also provides an opportunity to identify those patients who need more support regarding planning or decision-making and assigning the appropriate team member to support them.

LAUNCH: Development of a Curriculum for New Hemodialysis Patients

Dennis Smith, BScN, RN(EC), Lori Harwood, PhD, RN(EC), CNeph(C), Carolyn Ingram, BSc, RN, CNeph(C), London, ON

Patients start hemodialysis with varying levels of chronic kidney disease (CKD) education. Some patients have been followed in pre-dialysis clinics for many months or years, whereas other patients have started dialysis while being

admitted to hospital for an acute indication that has led to kidney damage or a rapid progression of their previous underlying CKD.

These new dialysis patients need clear education about how to minimize infection risk, and appropriate diet and fluid parameters. Patients and families also need individualized education regarding treatment modalities and dialysis access to ensure they are able to make treatment decisions that are based on the values and lifestyles they hold. Furthermore, patients in our program transition from site to site rapidly depending on their needs or the needs of the program; because of this, education plans are often incomplete and/or abandoned.

Our project outlines the development of a curriculum for new patients that can be transferable with the patient from in-centre dialysis, to satellite dialysis, and to home dialysis. We will explore the experience of 10 new patients after completing the LAUNCH program, assess their new levels of self-management and their uptake of home dialysis and transplant options, as well as identify any avoidable hospitalizations or emergency room visits.

Online-Priming: Improving the Lives of Patient(s) Diagnosed with Chronic Kidney Disease

Judy Dixon, MSN, RN, Maple, ON

Purpose: The purpose of this presentation is to illustrate that utilization of online-priming can improve longevity of patients diagnosed with chronic kidney disease. This presentation will also be indicative of the knowledge acquired during our program's transitioning phase to online-priming, as well as the benefits of online-priming, as it relates to the chronicity of kidney disease in our patient population. Operationally, utilizing online-priming will ultimately minimize the potential of infection and cross-contamination during the priming process.

Description: Online-priming treatment can be provided at any time without additional cost and workload. There is a significant reduction in the risk of errors and cross-contamination for staff and patients. Moreover, providing online-priming treatment is progressive, innovative, and setting exceptional standards, as it pertains to patients diagnosed with chronic kidney disease. In the interim, online-priming substitutes dialysate for saline, which ideally leads to better patient outcomes. This, in turn, will improve the lives of our patient population.

Evaluation/outcome: Implementing online-priming is an operationally cost-effective initiative that will assist in reducing cost for dialysis consumables; for example, it reduces waste volume, which equates to the elimination of saline and rinse/waste bag storage. Online-priming leads to improved patient outcomes, e.g., no sudden drop in blood volume and, thus, a reduced risk of hypotension in dialysis patients with cardiovascular problems.

Implications for nephrology practice/education: Treatment can be provided without additional workload and there is a significant reduction in the risk of errors and cross-contamination for staff and patients.

Husbands Living with Women on Dialysis: Embracing Their Transformed Life

Maryse Pelletier-Hibbert, PhD, RN, Fredericton, NB

Purpose: The purpose of this qualitative study was to explore the adjustment process of husbands living with women on dialysis.

Methods: Using Glaser's (1978) grounded theory methodology, data were collected from 18 husbands from NB, NS, and PEI through semi-structured face-to-face or telephone tape-recorded interviews.

Findings: The most central issue for these husbands was dealing with multiple changes in daily routines and future plans. In response, these men engaged in the basic social process of embracing their transformed life. The four stages of embracing a transformed life are: becoming aware, involving themselves, centring life on their wives, and striving to achieve balance. The marital relationship and the women's health status, as well as the presence of informal support and formal support are conditions that significantly influenced the process.

Implications for practice: The theory of embracing a transformed life provides a framework for understanding and explaining the complex interplay of strategies undertaken by these husbands to respond to, adjust to, and integrate changes. Moreover, the focus on husbands living with women on dialysis contributes towards closing an existing gap in knowledge, and the findings underscore the husbands' abilities to learn and carry out complex roles, responsibilities, and routines that require sophisticated observation, decision-making, and technical and problem-solving skills.

Conclusions: The discrete stages of the theory can guide health care professionals to better understand the various changes dialysis caregivers may experience during different phases of the patients' illness trajectory, and to implement gender-specific care to enhance adjustment and sustain efforts.

REFERENCE

Glaser, B.G. (1978). Theoretical sensitivity: Advances in the methodology of grounded theory. Mill Valley, CA: Sociology Press.

Funded by the Kidney Foundation of Canada Allied Health Research Grant





Creating a Renal Patient & Family Advisory Council

Angela Andrews, BScN, RN, Deborah Bezaire, MHS, RN, London, ON

The principles of patient and family centred care (PFCC) focus on treating patients and their families with dignity and respect, communicating and sharing information, and empowering patients and families. In an effort to "change the face of tomorrow" the renal program at a major teaching hospital has embraced the philosophy of PFCC to improve the patient experience. We have altered the way health care is delivered by including the patient and family perspective in decision-making processes throughout the program.

The purpose of this constantly evolving initiative is to create and sustain a renal patient and family advisory council (PFAC). Our goal is to collaborate with the patient and their family by inviting them to become team members in the decision-making process regarding their care. By including the patient and family perspectives, we hope to foster empowerment and improve the overall experience within the renal program. We will evaluate the outcomes by monitoring feedback and measuring overall patient and family satisfaction with the care they receive from the renal program.

The objective of the presentation is to outline the process of creating a renal PFAC, and to identify the logistics involved. Participants will have newfound knowledge about PFCC and how to create an advisory council in their own renal program.

Enhancing Self-Care Fluid Management in Hemodialysis: A Pilot Study Using Motivational Interviewing

Stacy Crown, BScN, RN, Christina Hurlock-Chorostecki, PhD, NP, William Clark, MD, FRCPC, FACP, FASN, Jessica Sontrop, PhD, Janet Vogel, RN, London, ON

Objective: To determine if the provision of motivational interviewing (MI) would enhance self-care fluid management in the hemodialysis patient population.

Introduction/background: Patients receiving hemodialysis are often challenged with restricting their fluid intake to ensure maintenance of interdialytic (ID) weight gains. Large fluid weight gains have been associated with hypertension, lower extremity edema, pulmonary edema, and heart failure. The standard care approach to helping patients who are receiving hemodialysis is to impose a fluid restriction and remove fluid during dialysis to a prescribed weight.

Hence, the ability to manage fluid gains rests on the patient's understanding and decisions to limit fluid intake. MI is a patient-centred, conversational, and collaborative approach to stimulating behaviour change and resolving ambivalence.

Methods: A mixed-methods pilot study with a quasi-experimental design was used to examine ID fluid weight gains over two four-week periods: before the intervention (baseline) and during the intervention. Patient experiences and perspectives were also explored.

Results: Reduction in fluid weight gain was 0.06 kg and was not statistically significant or clinically meaningful. However, most participants felt that the MI was helpful to very helpful in understanding the importance of fluid weight management and managing fluid gains.

Conclusions: MI alone, as an intervention, may be insufficient in altering ID fluid weight gains. However, this study is important in that it underlines the difficulty of altering ID fluid weight gain. Future research of bundled interventions including MI might provide a holistic approach to influencing self-care fluid management behaviour changes.

Understanding Your Peritoneal Dialysis Clinic Blood Values

Claire Bilik, BASc, Nancy Woodcock, RD, Janet Robinson, RN, CNeph(C), London, ON

An increasing incidence of chronic conditions has led to a greater need for patient self-management (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002). The purpose of this study was to promote patient self-management by encouraging patient input on the review and update of a self-management tool. "Understanding Your Peritoneal Dialysis (P.D.) Clinic Blood Values" was used to inform PD patients about their blood work at the Kidney Care Centre (KCC). A comprehensive literature review was conducted regarding disease self-management and patient surveys. All PD patients at the KCC who met the inclusion criteria were mailed a survey in December 2015. Survey results were used to guide the revision of the original resource. Fifty-two of 114 anonymous surveys were returned. Ninety percent of respondents "always" open and review the original resource when they receive it. Fiftyfour percent of respondents rated the lab values sheet as "very useful", and 42% rated it as "useful." Some lab tests were seen as more useful than others, especially phosphate and potassium. Ninety-six percent of patients preferred a new resource design compared to the original. Some questions had a much lower response rate and the first half of the survey was more thoroughly completed. Peritoneal dialysis patients at the KCC are very interested in their disease self-management and want to learn more about how to manage abnormal lab values. It is hoped that the results obtained from the patient survey may be expanded to support other populations within the London Health Sciences Centre (LHSC) renal care program.

REFERENCE

Barlow, J., Wright, C., Sheasby, J., Turner, A., & Hainsworth, J. (2002). Self-management approaches for people with chronic conditions: A review. *Patient Education and Counseling*, 48(2), 177–187. http://doi.org/10.1016/S0738-3991(02)00032-0

Are you SURE about your vascular access? Exploring factors influencing vascular access decisions with chronic hemodialysis patients and their nurses

By Mary Ann Murray, Alison Thomas, Ron Wald, Rosa Marticorena, Sandra Donnelly, and Lianne Jeffs

Copyright © 2016 Canadian Association of Nephrology Nurses and Technologists

ABSTRACT

A major decision for patients with stage 5 chronic kidney disease (CKD) relates to vascular access (VA) for treatment. Patients who receive pre-dialysis care often defer making a decision, which results in initiation of hemodialysis (HD) with a central venous catheter (CVC) in an urgent or emergent situation. Little is known about how individuals make decisions around VA. In this context, a mixed-methods study was undertaken to explore uncertainty related to changing their VA from an existing CVC to a graft or fistula. Quantitative assessment was measured using the SURE tool and interviews with patients and nurses were conducted. Results revealed that none of the 16 patient

ABOUT THE AUTHORS

Mary Ann Murray, PhD, RN, CON(C), GNC(C), CHPCNC(C), Advanced Practice Nurse, Home Hemodialysis Unit, The Ottawa Hospital, Ottawa, Ontario

Alison Thomas, MN, RN(EC), CNeph(C), Nurse Practitioner, Hemodialysis, St. Michael's Hospital, Toronto, Ontario. Alison Thomas is now at Halton Healthcare Services, Hemodialysis Program, Oakville, Ontario

Ron Wald, MDCM, MPH, FRCPC, St. Michael's Hospital, Toronto, Ontario

Rosa Marticorena, BScN, RN, DCE, Graduate Student Institute of Medical Science, University of Toronto, Clinical Research Coordinator III, Nephrology Research Offices, St. Michael's Hospital, Toronto, Ontario and William Osler Health System, Brampton, Ontario

Sandra Donnelly, MDCM, MSc, FRCPC, Corporate Chief of Medicine, William Osler Health System, Brampton, Ontario, Assistant Professor, University of Toronto, Ontario, Scientist, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Ontario

Lianne Jeffs, PhD, RN, FAAN, Director, Nursing Research, St. Michael's Hospital, Toronto, Ontario

Address for correspondence: Mary Ann Murray, The Ottawa Hospital, Riverside Campus, 1967 Riverside Drive, Ottawa, Ontario K1H 7W9.

Tel: 613-738-8400 ext. 82508

Email: mmurray@toh.on.ca

participants reported uncertainty. Qualitative findings revealed that patient decisions about access were impacted by observations, experiences, and dialogue in the hemodialysis unit. Study findings have important implications including the challenge of reconciling epidemiologic population-based risk measurement to the individual patient's situation. Moreover, the SURE tool was viewed as a mechanism to open a dialogue to confirm patients' decisions and provide further education and/or support following HD initiation.

Key words: decision support, chronic kidney disease, vascular access, hemodialysis

BACKGROUND

The most frequent renal replacement therapy for patients living with end stage renal disease is hemodialysis (HD), which requires a vascular access (VA). International guidelines recommend an arterio-venous fistula (AVF) access in terms of access longevity and improved morbidity and mortality outcomes compared to central venous catheters (CVC) (NKF-KDOQI, 2006). However, delays in creation of an AVF occur due, in part, to patient refusal and fear (Oliver, Rothwell, Fung, Hux, & Lok, 2004; Avorn et al., 2002). Consequently, Canadian CVC rates are well above international standards for best chronic kidney disease (CKD) care with a reported 79.6% of initial dialysis treatments using a CVC access in 2013 (Canadian Institute of Health Information, 2015). Following initiation of HD, AVF uptake remains limited with about half of patients (45%) continuing to use a CVC as their permanent vascular access after it has become evident that long-term HD will be required (Mendelssohn et al., 2006).

To date, efforts to help patients make timely decisions about access through patient and staff education have been largely unsuccessful. Furthermore, the downstream approach of engaging patients in decisions to switch from an acute start CVC access to a long-term AVF access has been disappointing. Studies have shown improved adherence to treatment recommendations when patients are encouraged to play an active role in decisions about their care. There is clear evidence that shared decision-making between patients and providers improves patient knowledge about treatment options, outcomes, and the limitations of medical care (Stacey et al., 2011). As well, engaging patients in care planning and decision-making has been shown to improve

knowledge adherence to plans of care and patient satisfaction (Molenaar et al., 2000; Edwards et al., 2000). When facing health care decisions, patients can often experience uncertainty, often referred to as decisional conflict (O'Connor, 1995). Identifying the source of decisional conflict (i.e., knowledge gaps, lack of clarity about personal values, support needs) and intervening to address unmet decision-making needs may help to improve AVF uptake.

In clinical practice areas other than CKD, decision support interventions have been found to be effective in reducing decisional conflict (Coulter, 2005; Murray, Brunier et al., 2009). The Registered Nurses Association of Ontario (RNAO) Best Practice Guideline (BPG), *Decision Support for Adults Living with Chronic Kidney Disease*, suggests several evidence-based approaches to help elicit reasons for and mitigate patients' decisional conflict (RNAO, 2009). However, to our knowledge, these recommendations have not been tested in clinical practice. Therefore, the purpose of this study was to determine the impact of implementing selected recommendations from the BPG (RNAO, 2009) on priority provincial targets for hemodialysis access in patients with stage 5D CKD who currently use a CVC as their HD access. Specific objectives were to:

- Identify the prevalence of decisional conflict in a cohort of patients with stage 5D CKD who receive HD via CVC access;
- Identify the most frequently reported sources of decisional conflict identified by patients with stage 5D CKD who receive HD via CVC access;
- c. Determine the impact of tailored decision support interventions identified from decisional conflict screening on HD access decisions among a cohort of patients with stage 5D CKD who receive HD via CVC access;
- d. Identify the acceptability and feasibility of such an approach from the perspective of patients with stage 5D CKD who receive HD via CVC access and providers; and
- e. Determine patients' and providers' perspectives related to barriers to changing vascular access type when CVC access is in place.

Items	Respo	nses
Do you feel SURE about the best choice for you?	Yes	No
Do you know the benefits and risks of each option?	Yes	No
Are you clear about which benefits and risks matter most to you?	Yes	No
Do you have enough support and advice to make a choice?	Yes	No
	Do you feel SURE about the best choice for you? Do you know the benefits and risks of each option? Are you clear about which benefits and risks matter most to you? Do you have enough support and advice to	Do you feel SURE about the best choice for you? Do you know the benefits and risks of each option? Are you clear about which benefits and risks matter most to you? Do you have enough support and advice to

METHODS

Design

A mixed-method prospective intervention study was conducted over an 18-month period. Quantitative and qualitative approaches were used to triangulate findings and provide a fuller perspective of decisional conflict and potential modifiers in the context of HD access decisions for patients with stage 5D CKD (Sandelowski, 2000a).

Intervention

The intervention combined the use of a decisional conflict screening tool (SURE Tool) and a targeted decision support intervention. The SURE tool (Figure 1), based on core concepts of the validated Ottawa Decisional Conflict Scale, has been used in screening decisional conflict in Frenchand English-speaking patients with a variety of health conditions (Legare et al., 2010; O'Connor, 1995). Four questions target sources of decisional conflict (feeling uncertain, feeling informed, feeling clear about values, and feeling supported in decision making). Responses are scored as 1 = yes or 0 = no. Scores of less than 3 indicate decisional conflict. If indicated by the SURE Tool results, decision support interventions were delivered through direct counselling from the nurse, collaboration with members of the inter-professional health care team, and/or through referral from a team member. As an example, counselling by the nurse included the provision of facts for patients with knowledge gaps and discussion about what was personally important for patients to achieve or avoid when/if unclear about personal values. Other decision support interventions could include: clarification of resources patients may need to make a decision and/or patient referral to relevant resources or members of the inter-professional team (i.e., facilitation of a team conference or family meeting, or referral to the social worker or nephrologist/nurse practitioner).

Setting

The study took place at St. Michael's Hospital, a large academic quaternary care hospital in Toronto, Canada, that provides hemodialysis care to more than 250 patients. At this facility, there is a high incidence of CVC use. At the inception of the study in February 2011, 144 patients (60.5%) received HD through a CVC.

Participants

A purposive sampling strategy was used. Patients and professional staff were recruited. Eligible patient participants were:

- Stage 5D CKD HD patients with CVCs;
- Candidates for AVF creation: minimum arterial diameter of 2 mm and minimum venous diameter of 2.5 mm on duplex ultrasound scan, absence of vessel calcification, no plan for impending transplant, no history of severe left ventricular systolic dysfunction, no condition that limits life expectancy such as active malignancy (NKF/KDOQI, 2006);
- Receiving dialysis therapy in the hemodialysis unit;
- · Able to communicate in English; and
- Deemed to be mentally and physically able to participate by the HD care team.

Eligible professional participants were members of the inter-professional in-centre HD team who provided direct patient care or directly influenced the delivery of hemodialysis care.

Procedure

Sessions outlining study information and procedures were held during staff meetings and rounds. Education based on the recommendations from the RNAO BPG for decision support in CKD were provided to HD clinic nurses by the HD nurse practitioner.

The HD nurses informed eligible patients about the study. A research assistant met with patients who expressed an interest in participating, provided detailed information about the study procedures, and obtained consent. The HD nurse then administered the SURE tool to screen for decisional conflict and documented the patient responses. As per the study protocol, a score of three or less on the SURE tool would trigger the nurse to help patients through the decision-making process by targeting the identified areas of decisional conflict. Following the decision support intervention, the SURE tool was repeated to evaluate the intervention in terms of the reduction of decisional conflict and to plan the next steps as required for the purpose of adjusting the patient's dialysis plan. Results of the decisional conflict screening, details related to any decision support intervention, outcomes, and planned next steps were documented in the patient health record.

Following completion of the SURE tool, patient participants were interviewed. Interview questions probed patients' perceptions about their decision-making related to hemodialysis access, knowledge of risks and benefits related to CVC and AVF access, and their informed values related to access options.

To gauge the acceptability and feasibility of using a decisional conflict screening tool and subsequent decision support interventions, interviews were conducted with nurses who were directly involved in the care of the study participants. Interview guides were adapted from our previous research about barriers, facilitators, and implementation strategies for decision support interventions (Murray, Wilson, Stacey D., Kryworuchko, & O'Connor, 2009). Specifically, participants were asked about their experiences with the SURE tool; their perceptions about the usefulness of the tool, barriers to use, and their understanding of the risks of CVC access for dialysis; and other decision support strategies they use to support patients.

Data Analysis

Quantitative data from the SURE tool scores was analyzed using descriptive statistics. Qualitative data were then analyzed using content analysis methodology in an approach that identifies codes or categories, and leads to determination of themes (Bradley, Curry & Devers, 2007). Line-by-line analysis to seek out key words or phrases (codes) identified themes or concepts, and was carried out individually. Following this, a face-to-face meeting was held where codes and categories were agreed upon through consensus. This approach ensured the use of well-established criteria to maintain trustworthiness and credibility of analysis processes and findings (Sandelowski, 2000b).

Ethical Consideration

Ethics approval was obtained from the St Michael's Research Ethics Board.

RESULTS

Characteristics of Patients

Sixteen patients participated in the study. The typical patient received in-centre HD and was between the ages of 40–60. Seven nurses agreed to be interviewed. All nurse participants were registered nurses with more than five years of experience in hemodialysis. See Table 1 for details related to participant characteristics.

Decisional Conflict Rates. Of the 16 patients who were screened for decisional conflict using the SURE Tool, none (n = 0) reported decisional conflict. Therefore, no decision support intervention was undertaken.

Qualitative Results

Two overarching themes emerged: (1) central line certainty and attachment, and (2) influence of practical considerations and personal and observed experiences on patients' decision clarity. The first theme emerged from patient reports, whereas the second theme emerged from nurse interviews.

Table 1: Characteristics of Participants

Characteristic	Patients (n=16)	Nurses (n=7)
Setting of care	Incentre conventional HD n=11 Incenter nocturnal HD n=4 Home HD n=1	Incentre nocturnal HD n=6 Home HD n=1
Age	32 – 75 years Median – 61.5 years	37.5 years of age (mean)
Length of time on dialysis/ experience in HD unit	5 months – 11 years, 11 months Median – 3 years	23 years
Previous AVF	3	N/A
Gender	8 female, 8 male	6 female, 1 male
Cause of ESRD	Diabetes – 7 Ischemic nephropathy - 1 Glomerulonephritis – 3 Polycystic Kidney Disease – 1 Other (HIV-associated nephropathy, focal segmental glomerulosclerosis) - 2 Unknown – 2	N/A

Patient Perspectives Related to Central Line Access Decision Making

Central Line Certainty and Attachment. All of the patient participants (n = 16) expressed certainty for maintaining their CVC access, often in opposition to the health care team's recommendations. The overall theme that emerged was "central line certainty and attachment". This theme was expressed through three inter-related sub-themes of decision reinforcements: (1) easier and more manageable option; (2) past and witnessed experiences as rationale for maintaining a CVC; and (3) the prospect of pain from cannulation.

Participants acknowledged that while providers had engaged them in conversations about AVF access benefits, they preferred to maintain their CVC access, as noted in the next two excerpts:

Table 2: Patient Perspectives Related to Central Line Access Decision Making

CVC access an easier more manageable option

Sample Comments

- ... "If I had an AVF, I wouldn't be able to move my arm. I would be restricted. With an AVF, I would feel uncomfortable." (P004)
- ... "The other is too painful and it's easy if you take care of it. AVF, sometimes it's clotted, it takes longer, too many problems." (P006)
- ... "It doesn't take long for the nurses to put you on ... It takes them less than 3 minutes to put you on (dialysis)... That lady (patient who has an AVF), it takes them 20 minutes to half an hour just to get through. Sometimes you can't have dialysis on the same day. This one (pointing to his line), if there's a problem they book you and they do an exchange and you can have dialysis on the same day" (P006)

Past and witnessed experiences used as a rationale for maintaining a CVC

The prospect of pain from cannulation reinforced CVC decision and informed patient reluctance to switch to an AVF access

- "I run into patients who have had nothing but problems with AVF" (P003)
- ... "I saw a patient that had a line for 20 years and he had no problems" (P014)
- ... "I have had no trouble with it and I have been here for 3 years or more" (P005)
- ... "I have a phobia to needles and this is pain free" (P009)
- ... "I hear people screaming I do not like that" (P002)
- ... "I'm choosing to have the line because it's less painful" (P015)

- "...The doctors tried to persuade me to have a AVF, but I said no I do not want it. They just kept pressuring and pressuring me....because there is a higher chance of the line getting infected." (P004)....
- "They tell me I would have better dialysis (with an AVF), but I do not believe that, you know why? Because I have no troubles...my dialysis is good...I have had no infection." (P002)

All but one participant reported having had discussions with a provider about venous access, as part of their decision-making. While participants were aware of risks associated with CVC use, they preferred to maintain the status quo, and were willing to take steps to prevent negative events such as infection and accepted those risks. For patients, the decision regarding acquisition of an AVF seemed to be framed from the standpoint of "why change" based on: past personal experience; the perception that dialysis was adequate with the CVC and that their CVC was easy to care for; weighting of their individual risk of infection and how they could mitigate that risk; prospect of pain associated with AVF access; and a comfort with continuing with what is familiar. Patients most frequently described infection followed by adequacy of dialysis, as potential downsides to using a CVC access when asked about what they felt the risks were of CVC use as a long-term vascular access.

- ... "Infections and you get sick. You can die." (P006)
- ... "Getting an infection because it's close to your heart." (P015)
- ... "In the past I had some problems, but I know better now. I cover my line now when I have a shower. I tape the line before I have a shower. Before that I didn't do that and I would have infections all the time. I have no problems now." (P004)

Overall, CVC access was seen as an easier and more manageable option from the patients' perspective. Past and witnessed experiences related to AVF issues were described as rationale for maintaining a CVC. Many participants commented that the prospect of pain from cannulation reinforced their decision and informed their reluctance to switch to an AVF. Specifically, the anticipation and fear of pain with cannulation and the vicarious experience in witnessing others' experience of pain were often reported as barriers to AVF use. In summary, patients remained committed to CVC access while being aware of the involved risks. Previous personal and vicarious experience reinforced their decision (Table 2).

Practical Considerations and Personal and Observed Experiences' Influence on Patients Decision Clarity

Nurses indicated that patients were very clear about their choice for dialysis access decisions and were confident in their choice. However, nurses perceived a dissonance around the degree of patients' understanding and the perceived clarity of patients' rationale to maintain their CVC. Nurses described the impact of waiting room conversations and observations on decision-making. Nurses also recognized that pain or the anticipation of pain was a barrier to converting to AVF access. Nurses agreed that from the patient perspective, the prospect of pain and practical

considerations such as shorter and simpler connection procedures associated with a CVC outweighed the benefits of an AVF. Table 3 provides examples of this theme.

Nurses viewed the SURE tool as a strategy to open discussion and gain further insight into the patients' perspectives. In addition, using the SURE tool provided an opportunity to revisit patients' decisions related to access, provide further information to patients, and clarify and identify reasons for patient choice. It was also seen as a way to moderate the effect of staff bias for a particular dialysis access type by obtaining a better understanding/appreciation of

patients' perspectives. As well, nurses noted that the tool was easy to use in clinical interactions.

Nurses also commented on barriers to the use of and best time to administer the SURE tool. Overall, language and patient cognitive impairment were most frequently described as barriers by most of the nurse respondents. From a timing standpoint, most nurse participants perceived that the SURE tool may be best integrated into the clinical pathway prior to patients initiating HD, as part of pre-dialysis teaching, and then readministered after the first weeks of starting dialysis. Table 4 provides sample comments.

Table 3: Nurse Perspectives Related to Patient Decision Making and Awareness of Risks and Benefits of CVC

lable 3: Nurse Perspectives Related to Patient Decision Making and Awareness of Risks and Benefits of CVC				
Key Categories	Sample Comments			
Patients were clear and confident about their access decision	 "they had made up their minds and they had really good reasons to them why they couldn't have a change in access." (Nurse B) "the patients were mostly already dead-set in their decision to keep the line." (Nurse E) 			
Dissonance around patients' understanding and perceived clarity of patients' rationale to maintain their CVC	 "I think it's a small percentage (of patients) that understand the risks and benefits some come in with their lines soaking wet and they don't understand that they can get a bad infection from this." (Nurse A) "I don't think all of them understand, because some of them change the dressing at home and they go bathe and take showers with it." (Nurse D) 			
Pain and practical considerations trumped need for change in access to AVF	 "most would not (understand risks). All they see is needles and they are scared of them or how much easier and quicker it is they can get on the machine with a catheter and that's what they want. They want in and out. They don't want to deal with bleeding and they are scared of bleeding at home once they get in the unit they see other people with AVFs and if there is trouble they see the pain or the difficulties 'cause they have the bruises, the aneurysms. They speak to the other patients in the lounge and on the machine and get the other people's experience when it might not be what will happen to them" (Nurse F) "they get comfortable with a line that gets put in. There is no pain. They see patients around them get needles put in that may have access problems. They are reluctant to give up that pain-free mode of access in dialysis." (Nurse C). 			

Table 4: Nurse Perspectives Related to Clinical Applicability of the SURE Tool

Key Categories	Sample Comments
The SURE tool as a strategy	• "It's a good way of opening up the discussion sometimes the patients, once they have been here for awhile and they see other patients with AVFs, they become more aware and more comfortable and they might revisit the idea." (Nurse E)
Mitigating professional bias	• "You got to see a patient's perspective and why they chose what they did and, based on their reasoning for choosing a line, you could address that and explain more" (Nurse A)
Easy to use in clinical interactions	 "I would (recommend it) because it's simple and it's clear and it's easy to use if you integrate it with your care it only takes a few seconds." (Nurse B) "The questions and steps were very simple to understand and apply to the patient It was easy." (Nurse D).
Barriers to use/ timing of use	 "If someone didn't speak English you cannot use it. There is only so much you can explain." (Nurse D) " If someone didn't speak English well, we had to explain in detail." (Nurse D). "a month or two weeks after they have started hemodialysis. The patient has so much to think about and diet and pills to them are more important." (Nurse B) "It's probably best used when a patient is about to start dialysis and then when they start dialysis to use again because when they start dialysis they feel overwhelmed and they don't always process all of it it's good to come back to it because they might not absorb all of it. The questions are good, it makes them understand, but if they don't understand what their choices are then it's a good opportunity for teaching." (Nurse E)

DISCUSSION

This study reports the experiences and views of patients and nurses related to HD access decision-making and on the clinical applicability of the SURE tool. Patients using a CVC access and who were candidates for an AVF were certain about maintaining their existing access when screened for decisional conflict with the SURE tool. Patients shared insights about their views on personal risk and how they viewed the prospect of switching from an existing CVC access to an AVF. Notwithstanding provider recommendations and with an apparent knowledge of the risks associated with continuing CVC use, patients preferred to maintain their CVC access. There may be several explanations for this. One explanation could be that patients were misinformed or unaware of the risks associated with long-term use of CVCs. However, this was not borne out in the patients' comments. Patients indicated that they were aware of the risks, particularly that of infection, and spoke of steps they had taken to reduce that risk. It appears that patients assessed their personal level of risk and believed that the population-based risk was an overestimate of their personal risk. This assessment was reinforced by the absence of any CVC-related complications, or if such a complication did occur, patients reported an ability to modify their behaviour to minimize a subsequent event. As such, their appraisal of the situation may be quite accurate and reasonable. This illustrates the challenging juxtaposition of epidemiological data (empirical knowledge) and patient situation and preferences (rational knowledge).

From an epidemiologic perspective, the evidence is clear about the relative benefits for AVF access, but, as borne out in this study, each patient has different priorities and preferences, which informed their dialysis access knowledge (NKF-KDOQI, 2006; Chaudry et al., 2010; Pisoni, Zepel, Port, & Robinson, 2015). Acknowledging the validity of multiple ways of knowing within the human experience challenges us as health care professionals to contextualize empirical, research-derived knowledge with other patterns of knowledge (personal, aesthetic, ethical patterns) (Carper,

Figure 2. Key points

- Providers may think that patients who initiate HD with a CVC have done so due to ambivalence about getting an AVF, but may still be open to an AVF in the future. However, patients consider their decision as final.
- Prospect of pain with AVF cannulation informed patient choice to maintain a CVC as vascular access.
- While patients with existing CVC access understand the risks and have made a reasoned decision, external factors such as observed experience and waiting room conversations can reinforce their certainty.
- RNs found the SURE tool to be useful in opening up dialogue regarding vascular access.

1992). Consequently, a person-centred approach that balances research-based evidence with patient circumstances and preferences may be preferable to the current strategy of encouraging AVF as the primary vascular access option, regardless of patient choice. There is an emerging debate among renal clinicians and in the CKD literature about tailoring vascular access options to reflect this philosophy (DeSilva et al., 2013; Oliver et al., 2012; Vachharajani et al., 2012).

Another possible explanation is that patients use a different value frame in considering AVF creation in the context of an existing CVC access. Providers may assign a higher value to end points such as lower rates of morbidity and mortality associated with AVF than patients do. For patients, practical considerations such as added time for dialysis due to AVF, past experience, and potential for discomfort or bleeding may hold stronger weight in the decision. Fear of the unknown may play a role in sustaining CVC decision to opt for a CVC, as living with a CVC is a known experience, whereas an AVF represents an unknown. Another explanation may be confirmation bias, which is a tendency to selectively consider information that confirms one's beliefs and not fully consider information that is inconsistent with one's beliefs (Jonas, Schulz-Hardt, Frey, & Thelan, 2001). When information is presented sequentially or when decisions are revisited, as in the case of reviewing VA choices, confirmation bias can be increased in parallel with a heightened commitment to the original decision (Jonas et al., 2001). In the context of this study, patients acknowledged that they had been previously engaged in access decision discussions, which suggests a need to consider how to revisit decisions and present information.

Fear or anticipation of pain is a major barrier to acceptance of AVFs as definitive vascular access for patients with existing CV access, and is consistent with findings from previous studies (Quinn et al., 2008; Xi et al., 2011). Multiple studies of CKD and HD patients report a pain prevalence of about 50% related to co-morbidities and musculoskeletal conditions and nephrology-related issues such as infection, cramping, renal cyst rupture, renal osteodystrophy, and calcific uremic arteriolopathy (Davison, 2003; Mercadante et al., 2005; Glick & Davison, 2011). Notably absent from this list is procedural pain related to cannulation of the HD vascular access, yet patients identify the fear of pain and the anticipation of cannulation pain as being significant (Bourbonnais & Tousignant, 2012; Çelik et al., 2011). These findings were validated by our study population, as patients clearly identified fear of cannulation pain as a deterrent to the decision to undergo AVF creation, particularly when they had the opportunity to observe the negative experiences of others in the hemodialysis unit.

Efforts to address pain with cannulation include the use of buttonhole or constant-site cannulation, a technique in whice the same site and angle of cannulation are used repeatedly to create a tunnel track into which a dull needle can be inserted. Studies have shown that buttonhole cannulation techniques do result in a less painful experience

for the patient (Marticorena et al, 2006; Pergolotti, Rich & Lock, 2011). However, buttonhole cannulation is also linked to increased risk of bacteremia and sepsis. Therefore, not all patients are candidates for buttonhole creation (Marticorena et al., 2006; Ludlow, 2010). Topical anesthetics have been shown to be effective in patients where pain is a concern, in situations where intradermal lidocaine is not effective, or for patients who fear needles (BC Renal Agency, 2011). As such, this therapeutic intervention may warrant consideration and could help to inform discussions about VA options.

Timing of discussion related to AVF creation was an issue identified by nurses. As seen in the results of this study, there was some reluctance to have an AVF placed once patients were receiving maintenance HD with a CVC. Pre-dialysis care has been associated with the receipt of an AVF likely due to the opportunity to educate patients about the benefits of this form of access and depriving them of the opportunity to experience HD with a CVC (Cavanaugh, Wingard, Hakim, Elasy, & Ikizler, 2009).

FUTURE DIRECTIONS FOR RESEARCH

Patients in this study identified a number of barriers to an elective conversion to AVF access. It would be interesting to ask patients to identify enablers of AVF adoption and to ascertain from patients who have lived this experience what the optimal timing for these discussions should be. Moreover, the importance of avoiding pain was a key factor linked to avoiding an AVF. Further study related to cataloguing the incidence and prevalence of cannulation discomfort and the effectiveness of current strategies to mitigate cannulation pain is warranted. While recent guidelines on the use of topical anesthetic agents for cannulation report that most patients do not indicate cannulation pain, one wonders if this is an artifact of not being asked the question (BC Renal Agency, 2011). Evidence from literature describing the fear of pain would be important for HD providers to become acquainted with. In addition, investigating the best way to package information and feedback regarding vascular access discussions for patients with existing HD accesses is also an area requiring further attention.

LIMITATIONS

This study had a number of limitations. The sample size was small, and the study was carried out in a single dialysis unit, thus compromising generalizability. Therefore, the quantitative results may not be applicable to other health care settings. In addition, as participants already had CVC access, this may have resulted in some discomfort

in answering questions about its use as a long-term access and may, therefore, have impacted findings. Regardless of these limitations, this study used rich data provided by a group of experienced informants on a topic that has been relatively under-researched. Although the data were based on participants' self-reports, which can, in and of itself contribute to bias, the emerging themes were consistent across participants, which lends support to the potential transferability of findings. Although descriptions of how participants contextualized the reasons for avoiding an elective access change differed between patients and nurses, there was general consistency overall.

CONCLUSION

Population-based clinical evidence related to improved outcomes with AVF versus CVC access has been well documented, yet our knowledge of how individual patients factor this evidence into their decision-making is more limited. In this study, patient decisions about access were heavily impacted by personal observations, experiences, and dialogue in the hemodialysis unit.

This study adds to our understanding of how patients perceive their personal risk when given recommendations by providers, and reflects a person-centred approach to care. Specifically, patients cited fear of painful and/or difficult cannulation and trust in their ability to manage complications of CVC, as reasons for their confidence in the decision to avoid AVF. The use of a screening tool to assess for factors that contribute to decisional conflict related to HD access was seen as a clinically useful mechanism to open a dialogue to confirm patients' decisions and to provide further education and/or support. The results of this study suggest that patients consider factors beyond population-based empirical evidence of risk and benefit when deciding whether to electively change from a CVC to AVF. Patient sentiments are easily summarized by the following maxim: My life; my line; my decision.

The SURE tool and its use in engaging patients in discussions are consistent with principles of person-centred care. Accordingly, clinicians need to be open to exploring with patients the reasons for their access choice and to revisit this decision episodically. The SURE tool offers a process to engage patients in this conversation. Understanding how patients living with long-term CVC access consider their individual risk will help us to develop evidence-informed interventions to help ensure that patients are empowered to make informed decisions consistent with their values and preferences.

REFERENCES

Avorn, J., Winklmayer, W.C., Bohn, R.L., Levin, R., Glynn, R.J., Levy, E., & Owen, W. (2002). Delayed nephrologist referral and inadequate vascular access in patients with advanced kidney failure. *Journal of Clinical Epidemiology*, 55, 711–716.

Bourbonnais, F.F., & Tousignant, K.F. (2012). The pain experience of patients on maintenance hemodialysis. *Nephrology Nursing Journal*, 39(1),13–20.

BC Renal Agency (2011). *Use of topical anaesthetics to ease cannulation pain.* Vascular Assess Guidline: BC Renal.

Bradley, E.H., Curry, L.A., & Devers, K.J. (2007). Qualitative data analysis for health services research: Developing taxonomy, themes, and theory. *Health Services Research* 42(4), 1758–1772.

- Canadian Institute of Health Information (2015). Canadian Organ Replacement Register Annual Report: Treatment of End-Stage Organ Failure in Canada, 2003–2013. Ottawa, ON: Canadian Institute of Health Information.
- Carper, B. (1992). Philosophical inquiry in nursing: An application. In J. Kichuchi & H. Simmons (Eds.), *Philosophic Inquiry in Nursing* (pp. 71–80). Newbury Park, CA: SAGE.
- Cavanaugh, K.L., Wingard, R.L., Hakim, R.M., Elasy, T.A., & Ikizler, T.A. (2009). Patient dialysis knowledge is associated with permanent arteriovenous access use in chronic hemodialysis. Clinical Journal of the American Society of Nephrology, 4, 950–956.
- Celik, G., Özbek, O., Yılmaz, M., Duman, I., Özbek, S., & Apiliogullari, S. (2011). Vapocoolant spray vs Lidocaine/Prilocaine cream for reducing the pain of venipuncture in hemodialysis patients: A randomized, placebo-controlled, crossover study. *International Journal of Medical Sciences*, 8(7), 623–627.
- Chaudry, M., Bhola, C., Joarder, M., Zimmerman, D., Quinan, P.M.D., & Lok, C.E. (2010). Seeing eye to eye: The key to reducing catheter care use. *Journal of Vascular Access*, 12(2),113–119.
- Coulter, A. (2005). What do patients and the public want from primary care? *British Medical Journal*, 331, 1199–1201.
- Davison, S.N. (2003). Pain in hemodialysis patients: Prevalence, cause, severity, and management. *American Journal of Kidney Diseases*, 42, 1239–1247.
- DeSilva, R.N., Patibandia, B.K., Vin, Y., Narra, A., Chawla, V., Brown, R.S., and Goldbarb-Rumyantzev, A.S. (2013). Fistula first is not always the best strategy for the elderly. *Journal of the American Society of Nephrology*, 24, 1297–1304.
- Edwards, A., Hood, K., Matthews, E., Russell, D., Russell, I., Barker, J., ... Stott, N. (2000). The effectiveness of one-to-one risk communication interventions in health care: A systematic review. *Medical Decision Making*, 20, 290–297.
- Glick, N., & Davison, S.N. (2011). Managing chronic pain in advanced chronic kidney disease. US Nephrology, 6(1), 21–28.
- Jonas, E., Schulz-Hardt, S., Frey, D., & Thelan, N. (2001). Confirmation bias in sequential information search after preliminary decisions: An expansion of dissonance theoretical research on selective exposure to information. *Journal of Personality and Social Psychology*, 80, 557–571.
- Légaré, F., Kearing, S., Clay, K., Gagnon, S., D'Amours, D., Rousseau, M., & O'Connor, A. (2010). Are you SURE? Assessing Patient Decisional Conflict with a 4-Item Screening Test. Canadian Family Physcian, 56, e308–e314.
- Ludlow, V. (2010). Buttonhole cannulation in hemodialysis: Improved outcomes and increased expense Is it worth it? *CANNT Journal*, 20(1), 29–37.
- Marticorena, R.M., Hunter, J., Macleod, S., Petershofer, E., Dacouris, N., Donnelly, S., & Goldstein, M.B. (2006). The salvage of aneurysmal fistulae utilizing a modified buttonhole cannulation technique and multiple cannulators. *Hemodialysis International*. 10(2), 193–200
- Mendelssohn, D.C., Ethier, J., Elder, S.J., Saran, R., Port, F.K., & Pisoni, R.L. (2006). Haemodialysis vascular access problems in Canada: Results from the Dialysis Outcomes and Practice Patterns Study (DOPPS II). *Nephrology Dialysis Transplantation*, 21, 721–728.
- Mercadante, S., Ferrantelli A., Tortorici, C., Lo Cascio, A., Lo Cicero, M., Cutaia, I., ... Casiccop, A. (2005). Incidence of chronic pain in patients with end-stage renal disease on dialysis. *Journal of Pain and Symptom Management*, 30(4), 302–4.

- Molenaar, S., Sprangers, M.A., Postma-Schuit, F.C., Rutgers, E.J., Noorlander, J., Hendriks, J., & de Haes, H.C. (2000). Feasibility and effects of decision aids. *Medical Decision Making*, 20, 112–127.
- Murray, M.A., Brunier, G., Chung, J., Mills, C., Craig, A., Thomas, A., & Stacey, D. (2009). A systematic review of factors influencing decision making in adults living with chronic kidney disease. *Patient Education and Counseling*, 76(2), 149–158.
- Murray, M., Wilson, K., Stacey D., Kryworuchko, J., & O'Connor, A.M. (2009). Nurses' perceptions of factors influencing patient decision support for place of care at the end of life. American Journal of Hospice and Palliative Medicine, 26(4), 254–263
- National Kidney Foundation Kidney Disease Outcomes Quality Initiative (2006). Clinical practice guidelines for vascular access. American Journal of Kidney Diseases, 48, S248–S272.
- O'Connor, A.M. (1995). Validation of a decisional conflict scale. *Medical Decision Making*, 15, 25–30.
- Oliver, M.J., Quinn, R.R., Garg, A.X., Kim, S.J., Wald, R., & Paterson, J.M. (2012). Likelihood of starting dialysis after incident fistula creation. *Clinical Journal American Society of Nephrology*, 7, 466–471.
- Oliver, M.J., Rothwell, D.N., Fung, K., Hux, J.E., & Lok, C.E. (2004). Late creation of vascular access for hemodialysis and increased risk of sepsis. *Journal of American Society of Nephrology*, 15, 1935–1942.
- Pergolotti A., Rich E., & Lock, K. (2011). The effect of the buttonhole method vs. the traditional method of AV fistula cannulation on hemostasis, needle stick pain, pre-needle stick anxiety, and presence of aneurysms in ambulatory patients on hemodialysis. Nephrology Nursing Journal, 38(4), 333–6.
- Pisoni, R.L., Zepel, L., Port, F.K., & Robinson, B.M. (2015). Trends in US vascular access use, patients' preferences, and related practices: An update from the US DOPPS practice monitor with international comparisons. *American Journal of Kidney Disease*, 65(6), 905–915.
- Quinn, R.R., Lamping, D.L., Lok, C.E., Meyer, R.A., Hiller, J.A., Lee, J.A., ... Oliver, M.J. (2008). The vascular access questionnaire: Assessing patient-reported views of vascular access. *Journal of Vascular Access*, 9, 122–128.
- Registered Nurses Association of Ontario (2009). *Decision Support for Adults Living with Chronic Kidney Disease*. Toronto, ON: RNAO. Retrieved from http://rnao.ca/bpg/guidelines/decision-support-adults-living-chronic-kidney-disease
- Sandelowski, M. (2000a). Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixedmethod studies. Research in Nursing and Health, 23, 246–255.
- Sandelowski, M. (2000b). Focus on research methods: Whatever happened to qualitative description? *Research in Nursing and Health*, 23, 334–340.
- Stacey, D., Bennett, C.L., Barry, M.J., Col, N.F., Eden, K., Holmes-Rovner, M., ... Thomson, R. (2011). Decision aids for people facing health treatment or screening decisions. *Cochrane Database of Systematic Reviews*. doi:10.1002/14651858. CD001431.pub4
- Vachharajani, T.J., Moossavi, S., Jordan, J.R., Vachharajani, V., Freedman, B.I., & Burkart, J.M. (2012). Re-evaluating the fistula first initiative in octogenarians on hemodialysis. *Clinical Journal of the American Society of Nephrology*, 6, 1663–1667.
- Xi, W., Harwood, L., Diamant, M.J., Belle Brown, J., Gallo, K., Sontrop, J.M., ... Moist, L. (2011). Patient attitudes towards the arteriovenous fistula: A qualitative study on vascular access decision making. Nephrology Dialysis Transplant, 26, 3302–3308.

An Evaluation of Medication Reconciliation in an Outpatient Nephrology Clinic

By Matthew Phillips, Jo-Anne Wilson, Amany Aly, Marsha Wood, Penelope Poyah, Sarah Drost, Anne Hiltz, and Holly Carver

ABSTRACT

Background: Accreditation Canada recognizes medication reconciliation as a key required organizational practice (ROP) to enhance patient safety. Patients with chronic kidney disease (CKD) carry a high risk for adverse drug events due to multiple co-morbidities, using many medications, and being cared for by many practitioners. Data evaluating the benefits of ambulatory medication reconciliation (AmbMR) in patients with advanced CKD is limited.

ABOUT THE AUTHORS

Matthew Phillips, RN, MHS, Nephrology Quality Leader, Central Zone Renal Program Nova Scotia Health Authority †

Jo-Anne Wilson, BScPhm, ACPR, PharmD, Clinical Pharmacy Coordinator, Division of Nephrology, Department of Medicine, Nova Scotia Health Authority, Associate Professor, Faculty of Health Professions, College of Pharmacy, Dalhousie University †

Amany Aly, BPharm, MHA, IDPhD (C), Dalhousie University

Marsha Wood, RN, MN, Nurse Practitioner – Nephrology, Central Zone Renal Program Nova Scotia Health Authority

Penelope Poyah, MD, FRCPC, Medical Lead for Renal Clinic, Central Zone Renal Program Nova Scotia Health Authority, Assistant Professor, Department of Medicine, Dalhousie University

Sarah Drost, BScPhm, Pharmacy Resident, The Ottawa Hospital

Anne Hiltz, BSc Pharm, ACPR, MHS, Senior Director Pharmacy and Renal Program, Nova Scotia Health Authority

Holly Carver, Medication Safety Pharmacy Technician, Nova Scotia Health Authority

This study was supported by a research grant through the Nova Scotia Health Authority (NSHA) Pharmacy Department. The authors would like to thank the NSHA Central Zone nephrology clinic nurses, clinic nurse educator, nursing lead, and health services manager for their contributions and support of this study.

† Both Matthew Phillips and Jo-Anne Wilson contributed equally to the writing of the manuscript.

Address for correspondence: Matt Phillips, Nova Scotia Health Authority, Room 908, 9th floor Bethune Building, VG Site, 1276 South Park Street, Halifax, NS B3H 2Y9.

Tel: 902-473-7075

Methods: We retrospectively evaluated types and rates of medication discrepancies and their potential index for patient harm using the Cornish classification system in a cohort of consecutive non-dialysis-dependent CKD stage 5 patients who received AmbMR.

Results: AmbMR was conducted 225 times on 115 patients during the study period. One hundred eighty medication discrepancies were identified. The most common discrepancy identified was incorrect drug followed by discrepant dose, discrepant frequency, and drug omission. Sixty-three percent of discrepancies were classified as unlikely to cause patient discomfort or clinical deterioration, 36% were classified as likely to cause moderate harm, and one percent was classified as potential to cause serious harm.

Conclusion: Medication discrepancies are common in patients with advanced CKD. Nearly a quarter of patients may experience moderate discomfort or clinical deterioration from discrepancies. Our study showed that in patients with non-dialysis-dependent CKD stage 5, the risk of patient harm associated with medication discrepancies can be reduced by conducting AmbMR.

Medication reconciliation is recognized as an evidence-based practice that improves patient safety by identifying and resolving issues related to medication management (Accreditation Canada, 2015). It is a structured, shared process whereby health care professionals obtain a Best Possible Medication History (BPMH), identify and resolve discrepancies, and communicate this information to the patient/family/caregiver and other relevant health care professionals (Accreditation Canada, 2015; Chan, Mahalingham, Richardson, Fernandes, & Battistella, 2015).

Most patients with advanced chronic kidney disease (CKD) have multiple co-morbidities including diabetes, hypertension, anemia, bone mineral disorders, and cardiovascular disease. (Manley & Carroll, 2002; Salgado, Moles, Benrimoj, & Fernandez-Llimos, 2012; St. Peter, 2010; Stemer & Lemmens-Grubber, 2011). It has also been reported that people with CKD take an average of 10 medications daily (Belaiche, Romanet, Allenet, Calop, & Zaoui, 2012). Scott, Gray, Martin, and Mitchell (2012) identified that for patients taking more than seven medications, there was an 82% risk of experiencing an adverse drug reaction. Additionally, patients with CKD are managed by an average of 4.7 primary care and specialist physicians (St. Peter, Wazny, & Patel, 2013). Considering these factors, patients with CKD are at high risk for experiencing an adverse event. Not surprisingly, 25% of one ambulatory patient population have reported experiencing at least one adverse drug event (Manley, McClaran, et al., 2003).

While previous studies (Barton-Pai et al., 2013; St. Peter et al., 2013) have evaluated the safety benefits of conducting Ambulatory Medication Reconciliation (AmbMR) in dialysis patients, there are limited data on the benefits in non-dialysis-dependent patients with CKD stage 5. We sought to evaluate medication discrepancies identified through AmbMR in non-dialysis-dependent patients with advanced CKD by determining the rates and types of discrepancies and by categorizing identified medication-related discrepancies by their potential index for patient harm, as defined by the Cornish Classification System (Cornish et al., 2005).

METHODS

This was a retrospective cohort study of CKD stage 5 patients who had AmbMR conducted at a nephrology clinic of the Nova Scotia Health Authority, Halifax, Nova Scotia, during October 2013 to April 2015. The research protocol was reviewed by the hospital's Research Ethics Board and classified as a quality assurance project. Individual patient consent was not required.

All non-dialysis-dependent patients with an estimated glomerular filtration rate (eGFR) of equal to or less than 11 mL/min/1.73m² using the Modification of Diet in Renal Disease (MDRD) study equation (Levey et al., 2006) were included. This target population was chosen as these patients had AmbMR (Appendix A) performed at each visit by clinic staff, as part of their routine medical care. AmbMR was a shared responsibility between nurses (registered nurses and licensed practical nurses) who conducted the BPMH and identified discrepancies, and nephrologists who reconciled the discrepancies. In the Chronic Renal Insufficiency Clinic, nurse practitioners conducted the BPMH and reconciled discrepancies. Hospital electronic databases were used to identify eligible patients during the study period.

Since this was a retrospective study, clinical and demographic data were retrieved from chart review and hospital electronic databases for the following: age, gender, eGFR, medication name/dose/route/frequency, medication class, details of discrepancy and action taken (medication continued, discontinued, changed, or not prescribed), and medication sources (patient/family, prescription vials/blister packs, community pharmacy, family physician, long-term care facilities, and hospital electronic records) used for the BPMH. The BPMH is based on a systematic and comprehensive review of all medications a patient is taking (Institute for Safe Medication Practices Canada, 2015).

Two investigators (pharmacist and nurse practitioner) classified each discrepancy identified on each AmbMR by the type of discrepancy (drug omission, discrepant dose, discrepant frequency, or incorrect drug). A medication discrepancy was defined as any difference seen between the information sources used to complete the BPMH. Drug omission was defined as a drug that the patient was not prescribed, but should have been; discrepant dose was defined as a difference in dose between the two sources of information, or an incorrect dose; and incorrect drug was defined

as a medication the patient was prescribed, but was not taking, or a medication that the patient was taking without being prescribed. Each clinician further categorized medication discrepancies by the level of harm (Class 1: unlikely to cause patient discomfort or clinical deterioration; Class 2: potential to cause moderate discomfort or clinical deterioration; or Class 3: potential to result in severe discomfort or clinical deterioration). This system of assessing the clinical impact of medication discrepancies has been previously published (Cornish et al., 2005). When there was disagreement between the two investigators, the discrepancy was referred to a nephrologist who made an independent determination of the level of harm.

The primary outcomes were to determine: (1) the number and types of medication discrepancies and (2) the number of medication discrepancies resulting in patient discomfort or clinical deterioration according to the Cornish scoring system (Cornish et al., 2005). Secondary outcomes included: (1) the classes of medications involved in the discrepancies; (2) the documented action taken when discrepancies were identified (change, continue, discontinue, or not prescribed), and (3) an evaluation of the quality of the BPMH using metrics from the Canadian Patient Safety Institute (CPSI) Medication Reconciliation National Audit Tool (metrics include: at least two sources of information documented, where patient, family, or caregiver is identified as one of the two sources of information; and, every medication has a name, dose, route, and frequency) (Canadian Patient Safety Institute, 2015).

Descriptive statistics for AmbMR characteristics were represented as means and standard deviations (M \pm SD) for continuous normally distributed data and percentages for categorical data. Inter-rater reliability was validated using Cohen's Kappa methods.

RESULTS

During the study period (October 2013 to April 2015), 115 patients with an eGFR less than 11 mL/min/1.73m² received AmbMR in the nephrology clinic. Of these, 63 (55%) participated more than once. AmbMR was conducted 225 times during the study period by the renal clinic staff. The mean patient age was 65 ± 15 years. The mean number of medications that patients were taking was 12 ± 4.5 . Fifty percent of participants were female. The mean eGFR was $10 \text{ L/min}/1.73\text{m}^2$.

A total of 180 medication discrepancies were identified from the 225 AmbMR forms completed. The mean number of discrepancies per patient was 1.55 ± 1.93 . The types of discrepancies identified most commonly were incorrect drug followed by discrepant dose. Sixty-three percent of medication discrepancies were classified as unlikely to cause patient discomfort or clinical deterioration, followed by thirty-six percent that were classified as likely to cause moderate harm or clinical deterioration. Two discrepancies were classified as having the potential to cause serious harm (Table 1). There was 100% agreement between the two investigators in classifying medication discrepancies having the potential to cause serious harm. Cohen's Kappa

Table 1: Type and Class of Discrepancy

Discrepancy Categories	n	Class 1	Class 2	Class 3	
Drug Omission	14 (8%)	10 (6%)	4 (2%)	-	
Discrepant Frequency	23 (13%)	16 (9%)	7 (4%)	-	
Discrepant Dose	41 (23%)	23 (13%)	17 (9%)	1 (0.5%)	
Incorrect Drug	102 (57%)	65 (36%)	36 (20%)	1 (0.5%)	
Total	180 (100%)	114 (63%)	64 (36%)	2 (1%)	
Class 1: No patient harm or clinical deterioration Class 2: Potential to cause Moderate patient harm or clinical deterioration Class 3: Potential to cause Severe patient harm or clinical deterioration					

inter-rater reliability was calculated to be 0.81 (95% CI, 0.75 – 0.87) for the classification of the level of harm.

The classes of medications associated with the discrepancies were: CKD-related (28%); cardiovascular (23%); gastrointestinal (9%); antihyperglycemics (8%); respiratory (6%); central nervous system (6%); and miscellaneous (19%). When discrepancies were identified, 41% of medications were discontinued or changed, 28% were referred to the family physician, and 25% included no documented action plan (Table 2).

Regarding the quality metrics of the BPMH (Table 3), 62% of completed AmbMR forms had at least two sources of information documented. Sixty-four percent had the patient/family/caregiver documented as one of the sources of information. The most common sources of information used to obtain the BPMH were the community pharmacy-generated medication list (n=189) and the patient/family/caregiver (n=144). Other sources of medication information used included prescription vials (n=64), electronic hospital record (n=7), and the long-term care medication administration record (n=2). Every medication in the BPMH had name, route, dose and frequency documented in 91% (n=2,330) of the time. Calcium carbonate (Tums®) and over-the-counter (OTC) medications accounted for the majority (7%) of the medications missing one of these elements.

DISCUSSION

Medication discrepancies were identified in 80% of non-dialysis-dependent CKD stage 5 patients who had AmbMR performed during their nephrology clinic visit. Nearly 40% of medication discrepancies were associated with a moderate level of patient harm or clinical deterioration. The most common types of discrepancies identified by clinicians were incorrect drug followed by incorrect dose. Our findings are similar to a previous study where 97% of dialysis-dependent CKD stage 5 patients had medication-related problems identified during medication review (Manley, McClaran, et al., 2003).

In our study cohort, non-dialysis-dependent patients with CKD stage 5 were taking complex medication regimens with an average of 12 ± 4.5 medications. This finding

Table 2: Documented Action Taken For Discrepancies

Not Prescriber	28.3% (n=51)
Not Documented	25% (n=45)
Discontinue Medication	18.9% (n=34)
Continue Medication	15.6% (n=28)
Change Medication	12.2% (n=22)

is consistent with other studies reporting the number of medications in patients with advanced CKD (Barton-Pai et al., 2013; Belaiche et al., 2012; Manley, Cannella, Bailie, & St. Peter, 2005; Nguyen, 2007). Additionally, each patient in this study had at least one discrepancy identified with an average number of 1.55 ± 1.93 discrepancies per patient. There are limited data on mean discrepancy rates in patients with advanced CKD. However, in hemodialysis studies, the mean rates of medication-related problems per patient was between 3.6 ± 1.8 (Manley, Drayer, & Muther, 2003) and 4.5 (range of 2.8 to 7.2) (Barton-Pai et al., 2013).

Patients with advanced CKD are not only at risk of medication discrepancies and medication-related problems, they are also at risk of experiencing an adverse drug reaction (ADR); Scott and colleagues (2012) have reported that an increased number of medications correlates with a higher number of adverse drug events. Other risk factors reported to be associated with ADRs are common in a patient with advanced CKD such as: (a) three or more co-morbidities, (b) five or more medications present in the drug regimen, (c) 12 or more medication doses per day, (d) medication regimen changed four or more times in a 12-month period, (e) non-adherence to medication regimen, (f) presence of medications that require therapeutic monitoring, (g) multiple prescribers, and (h) advanced age (Manley, McClaran, et al., 2003; Manley et al., 2005). Clearly, patients with CKD are at high risk, as they meet many criteria that expose them to potential ADRs.

Table 3: CPSI Quality Metrics

The patient/family member/caregiver as one of the sources of information	64% (n=145)
At least two sources of information used to obtain BPMH	62% (n=140)
Every Medication in BPMH has name, dose, route, and frequency	91% (n=2,330)

Although this study took place in an outpatient nephrology clinic, only 28% of the discrepancies identified were directly related to CKD medications, followed by 23% of medications related to cardiovascular therapies. This is similar to a previous study where 35% and 33% of drug therapies involved in discrepancies were related to CKD and cardiovascular medications, respectively (Belaiche et al., 2012). This is not surprising given that patients with CKD usually have cardiovascular comorbidities. It has also been reported that patients with CKD are managed by an average of five primary care and specialist physicians (St. Peter et al., 2013). These findings illuminate the importance of conducting AmbMR in this patient population and the need for employing good communication links between all members of the CKD health care team.

This study had several limitations. Although the target population for conducting AmbMR in our nephrology clinic was patients with an eGFR $<11 \text{mL/min/1.73m}^2$, it is not known if patients with higher eGFR would benefit to the same degree. Additionally, several studies report on medication-related problems and ADRs, whereas we report on

the identification and resolution of medication discrepancies. While this made direct comparisons difficult, reporting on medication discrepancies may be perceived as a strength, as issues identified on AmbMR could be resolved proactively rather than reporting on ADR events that have already occurred. Another strength of this study is that it contributes to the limited data reporting on the benefits of conducting AmbMR in non-dialysis-dependent patients with advanced CKD. Lastly, the quality metrics employed in this study were modelled after existing inpatient medication reconciliation metrics developed by CPSI (2015). The AmbMRs completed on study participants were deemed to be of high quality, as the majority of BPMHs were obtained from information sources gathered from the patient's community pharmacy and the patients who brought their medication bottles to their clinic appointment. In addition, nearly all medications in the BPMH had an identified name, dose, route, and frequency. The evaluation of AmbMR using standardized quality metrics is necessary to ensure that AmbMR is being completed well.

CONCLUSION

This study has demonstrated that patients with advanced CKD are at high risk for medication discrepancies. The implementation of AmbMR in our nephrology clinic model of care led to improved safety, as a result of identifying and resolving medication discrepancies. The findings from this evaluation support the need to routinely conduct high-quality AmbMR in non-dialysis-dependent patients with CKD stage 5. Given the resources required to conduct high-quality AmbMR, more research is needed to determine if patients at earlier stages of CKD will derive maximum benefits from AmbMR.

REFERENCES

- Accreditation Canada, (2015). Required organizational practices: Handbook 2016. Ottawa, ON.
- Barton-Pai, A., Cardone, K., Manley, H., St. Peter, W., Shaffer, R., Somers, M., & Mehotra, R. (2013). Medication reconciliation and therapy management in dialysis-dependent patients: Need for a systematic approach. Clinical Journal of the American Society of Nephrology, 8, 1988–1999.
- Belaiche, S., Romanet, T., Allenet, B., Calop, J., & Zaoui, P. (2012). Identification of drug-related problems in ambulatory chronic kidney disease patients: A six-month prospective study. *Journal of Nephrology*, 25(5), 782–788.
- Canadian Patient Safety Institute (CPSI). (2015). Measures: Medication reconciliation (Med Rec). Retrieved from http://www.patientsafetyinstitute.ca/en/toolsresources/psm/pages/medrec-measurement.aspx
- Chan, W., Mahalingham, G., Richardson, R., Fernandes, O., & Battistella, M. (2015). A formal medication reconciliation programme in a hemodialysis unit can identify medication discrepancies and potentially prevent adverse drug events. *Journal of Renal Care*, 41(2), 104–109.
- Cornish, P.L., Knowles, S.R., Marchesano, R., Tam, V., Shadowitz, S., Juurlink, D.N., & Etchells, E.E. (2005). Unintended medication discrepancies at the time of hospital admission. *Archives of Internal Medicine*, 165(4), 424–429.

- Institute for Safe Medication Practices (ISMP) Canada. (2015). *Medication reconciliation*. Toronto, ON. Retrieved from: www.ismp-canada.org/medrec/
- Levey, A., Coresh, J., Greene, T., Stevens, L., Zhang, Y., Hendriksen, S., ... Van Lente, F. (2006). Using standardized serum creatinine values in the modification of diet in renal disease study equation for estimating glomerular filtration rate. *Annals of Internal Medicine*, 145(4), 247–254.
- Manley, H., & Carroll, C. (2002). The clinical and economic impact of pharmaceutical care in end-stage renal disease patients. *Seminars in Dialysis*, *15*(1), 45–49.
- Manley, H., McClaran, M., Overbay, D., Wright, M., Reid, G., Bender, W... & Muther, R. (2003). Factors associated with medication-related problems in ambulatory hemodialysis patients. American Journal of Kidney Diseases, 41(2), 386–393.
- Manley, H., Drayer, D., & Muther, R. (2003). Medication-related problem type and appearance rate in ambulatory hemodialysis patients. *BMC Nephrology*, 4, 10.
- Manley, H., Cannella, C., Bailie, G., & St. Peter, W. (2005). Medication-related problems in ambulatory hemodialysis patients: A pooled analysis. American Journal of Kidney Diseases, 46(4), 669–680.
- Nguyen, T. (2007). The consultant pharmacist's role in dialysis: An introduction. *The Consultant Pharmacist*, 22(12), 1035–1044.

- Salgado, T., Moles, R., Benrimoj, S., & Fernandez-Llimos, F. (2012). Pharmacists' interventions in the management of patients with chronic kidney disease: A systematic review. Nephrology Dialysis Transplantation, 27, 276–292.
- Scott, I., Gray, L., Martin, J., & Mitchell, C. (2012). Minimizing inappropriate medications in older populations: A 10-step conceptual framework. *The American Journal of Medicine*, 125(6), 529–537e1–e4.
- St. Peter, W. (2010). Improving medication safety in chronic kidney disease patients on dialysis through medication reconciliation. Advances in Chronic Kidney Disease, 17(5), 413–419.
- St. Peter, W., Wazny, L., & Patel, U. (2013). New models of CKD care including pharmacists: Improving medication reconciliation and medication management. *Current Opinions in Nephrology and Hypertension*, 22(6), 656–662.
- Stemer, G., & Lemmens-Grubber, R. (2011). Clinical pharmacy activities in chronic kidney disease and end-stage renal disease: A systematic literature review. *BMC Nephrology*, 12, 35.

Appendix A: Ambulatory Medication Reconciliation Form



NOTICE BOARD

- September 17–20, 2016. 45th Annual European Dialysis and Transplant Nurses Association/ European Renal Care Association (EDTNA/ERCA) International Conference, The Valencia Conference Centre, Valencia, Spain. queries@edtnaerca.org
- September 19 to October 7, 2016. CNA certification exams offered
- September 21, 2016. Nephrology Health Care Professionals' Day
- October 6–7, 2016. B.C. Kidney Days, Four Seasons Hotel, Vancouver, British Columbia.
 www.bcrenalagency.ca
- October 8–10, 2016. ANNA Fall Meeting, Sheraton San Diego Hotel & Marina, San Diego, California.
 www.annanurse.org
- October 27–29, 2016. Canadian Association Nephrology Nurses and Technologists (CANNT) 49th National Symposium 2016—Changing the Face of Tomorrow, London, Ontario. www.cannt.ca
- November 15–20, 2016. American Society of Nephrology (ASN) Kidney Week 2016, McCormick Place, Chicago, Illinois. www.asn-online.org
- CANNT Vascular Access Guidelines: available now in the members only section at **cannt.ca**!

CANNT is asking for expressions of interest for co-chairs for the 2017 CANNT National Conference in Halifax, and the 2018 CANNT National Conference in Quebec City. If you are a CANNT member from either of these cities, please email your expression of interest to the CANNT office.

PLEASE SEND ALL SUBMISSIONS, QUESTIONS, OR COMMENTS TO:

Jovina Bachynski and Matt Phillips, Co-Editors, CANNT Journal: Jovina Bachynski:

CANNT.journal1@gmail.comMatt Phillips:

CANNT.journal2@gmail.com

The Canadian Organ Replacement Register: From data submission to final reports

By Alison Thomas

INTRODUCTION

In a previous column (Kim & Thomas, 2015), we described how nephrology nurses make a significant and important contribution to the Canadian Organ Replacement Register (CORR) database through incident and annual reporting of patient-specific and unit-level data. In this follow-up column, the objective is to illustrate how the data provided by individual centres translate into the visual reports published by the Canadian Institute for Health Information (CIHI) team. Every spring, CIHI releases the latest annual statistics through a snapshot that summarizes the data collected through the initial registration and annual update forms completed by each program (CIHI, 2016). The 2016 snapshot with a link to tables and figures can be found at the following web page: https:// www.cihi.ca/sites/default/files/document/2016_corr_ snapshot_enweb.pdf

INCIDENCE DATA

Incidence data refer to the description of patients with end stage kidney disease (ESKD) who were started on dialysis in a given year in Canada, and reflects the patient's status only on that occasion. A patient can only be registered one time as a new or incident patient with ESKD. Any data collected regarding treatment modality, transplantation, or recovery of kidney function after the initial start date is provided via update forms and is referred to as prevalence data.

In order to connect the data collected by programs via registration forms to the data produced in the tables and figures, we can begin by looking at the CORR Initial Registration Form. In section A, demographic and personal identification information are reported, as illustrated in Figure 1 below.

SECTION A-PERSONA	AL IDENTIFICATION	
(Patient label may be atta	ached If same Informatio	n is provided.)
Patient Last Name:		
Patient Former Name: _		
Patient First and Middle N	Names:	
Patient Address (city and	d province only):	
Patient Postal Code:		
Health Card Number:		
Province of Health Card:		
Date of Birth: _	V———V———	(DD/MON/YYYY)
Sex (check one):	Male	☐ Other
Race (check one):	Caucasian/white (01)	☐ Asian (02)
☐ Black (03) ☐	Indian Sub-continent (05)	☐ Pacific Islander (08)
☐ Aboriginal (09) ☐	Mid-East/Arabian (10)	☐ Latin American (11)
□ Unknown (98)	Other/Multiracial (99)	

Figure 1: Section A—Personal Identification

ABOUT THE AUTHOR

Alison Thomas, MN, RN(EC), CNeph(C), Nurse Practitioner, Hemodialysis, St. Michael's Hospital, Toronto, Ontario Information collected in this section of the registration form can then be used to describe the location, racial background, and sex of incident patients with ESKD in Canada; this is reflected in Table 1: CORR Report Table 2 extracted from the 2015 CORR data.

Table 2 Incident end-stage kidney disease patients by province/territory, Canada (excluding Quebec), 2005 to 2014 (number, rate page million population)

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
B.C./Y.T.	N	636	700	718	697	762	749	776	884	912	728
	RPMP	148.4	161.2	165.4	157.8	169.8	164.1	168.4	189.8	197.5	155.7
Alta./N.W.T./	N	531	482	525	481	527	490	506	531	568	603
Nun.	RPMP	159.5	139.8	146.3	131.0	140.0	129.0	131.2	134.4	138.4	143.5
Sask.	N	171	183	195	177	200	158	174	214	185	205
	RPMP	172.0	185.7	195.0	174.6	194.2	151.3	164.5	198.2	166.9	182.7
Man.	N	234	298	251	285	282	299	266	302	253	275
	RPMP	198.7	253.0	210.2	236.3	230.8	242.2	212.7	238.4	200.0	214.8
Ont.	N	2,269	2,309	2,364	2,288	2,362	2,503	2,536	2,532	2,813	3,076
	RPMP	180.9	182.0	184.8	176.9	180.7	189.2	189.6	187.5	207.8	224.9
N.B.	N	123	140	112	148	130	135	124	144	64	82
	RPMP	163.6	186.9	150.2	198.1	173.5	179.3	164.1	190.5	84.7	108.7
N.S./P.E.I.	N	187	166	200	224	188	200	174	178	177	170
	RPMP	173.8	154.7	186.2	208.2	174.2	183.8	159.4	162.6	163.0	156.2
N.L.	N	93	81	88	106	125	130	140	109	103	130
	RPMP	180.2	158.9	173.7	209.3	245.6	254.3	274.2	212.6	195.6	245.7
Canada	N	4,244	4,359	4,453	4,406	4,576	4,664	4,696	4,894	5,075	5,269
	RPMP	172.0	174.6	176.4	172.3	176.6	177.9	177.2	182.4	187.9	192.8

Notes
PMM* Rate per million population.
Data from Quebe was excluded from this table because of significant under-reporting between 2011 and 201
Sources

Table 1: CORR Report Table 2: Incident End Stage Kidney Disease Patients by Province/Territory, Canada (excluding Quebec), 2005 to 2014

The benefit to seeing the data presented as they are in this table is that it demonstrates a 10-year perspective of the incidence of ESKD patients starting dialysis nationwide, breaks down the numbers by province, and provides overall totals for Canada. Using Manitoba as an example, we can see that there has been an increase of incident or new dialysis patients in 2014, as compared to 2005, and that the number of incident dialysis patients overall in Canada per million population has also increased from 172.0 in 2005 to 192.8 in 2014. Trends such as these are important to recognize when proposing or planning for new program funding and resources.

Sections B and C. Information requested in Section B (pre-dialysis and initial bloodwork) reflects when a patient was first referred to a nephrologist for assessment, and Section C reflects date of the first renal replacement therapy and initial body access, as seen in Figures 2 and 3.

By combining the date the patient was first seen by a nephrologist and the start date of renal replacement therapy, interpretation of the number of late referrals to nephrologists can be determined, as seen in Table 2: CORR report Table 7.

A late referral is defined as a dialysis start less than 90 days after first seeing a nephrologist. Early referral to a nephrologist facilitates patient education, informed

SECTION B-PRE-DIALYSIS AND INITIAL BLOOD WORK

Date when patient first seen by nephrologist:				
(DD/MON/YYYY)				
Was patient followed by a nephrologist prior to initiating dialysis?				
(check one): no pre-dialysis follow-up (0)				
□ yes followed in nephrologist's office (1)				
☐ yes followed in speciality clinic (2)				
☐ yes followed in both office and clinic (3)				
□ unknown (9)				

Figure 2: Section B—Pre-Dialysis and Initial Bloodwork

SECTION C-INITIAL AND	INTENDED DIALYSIS TREATMENT				
Access used at time of initial dia	alysis (check one):				
Haemodialysis Temporary catheter non-cuffed (1)					
☐ Temporary catheter cuffed (2)	rary catheter cuffed (2) Permanent catheter non-cuffed (3)				
Permanent catheter cuffed (4)	(4) AV fistule (5) AV graft (6)				
Peritoneal Dialysis	PD catheter (7)				
	therapy: (DDIMON/YYYY) ccfy location, type and level of assistance/care.)				
mital dialysis beautient type (ope	city location, type and level of assistance care.)				

Figure 3: Section C—Initial and Intended Dialysis
Treatment

modality selection, body access planning and placement, and an elective start on renal replacement therapy. This data set demonstrates that early referral numbers in Canada have not increased over the past decade; in fact, it seems to have decreased overall (34.5% in 2005 and 29.0% in 2014).

PREVALENCE DATA

Prevalence data reflect events that occur in patients who are on dialysis and are collected after the initial registration form is completed. Practically speaking, facility profile and change of status forms are used to report prevalence data. As illustrated in Figure 4 below, changes to modality, treatment location, transfer between programs, and death or treatment withdrawal are collected via CORR.

Reporting of date and cause of death data then allows us to determine survival rates in dialysis patients, as shown in Figure 6: CORR Report Figure 3 below. From the data, one can see that younger people on dialysis live longer than older patients. Not surprisingly, one can also see that rate of survival falls steadily in all age groups over time in a linear fashion.

Table 7 Incident end-stage kidney disease patients with late referral status,* by province/territory and Canada (excluding Quebec), 2005 to 2014 (percentage)

Province/territory	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
B.C./Y.T.	31.4	29.6	31.0	32.9	33.8	29.9	33.8	30.0	28.7	26.0
Alta./N.W.T./Nun.	34.1	39.0	30.8	33.3	31.4	30.3	27.6	27.2	27.7	26.9
Sask.	34.3	40.2	27.3	29.4	28.2	31.6	30.8	26.6	25.3	23.1
Man.	32.8	33.8	32.9	24.8	29.1	28.4	26.2	26.9	24.5	25.5
Ont.	36.0	33.4	31.8	31.9	31.6	29.8	29.6	24.9	26.8	30.9
N.B.	37.2	38.7	38.5	32.0	34.1	34.6	31.6	28.1	34.0	26.9
N.S./P.E.I.	30.9	25.2	26.0	26.1	26.5	23.6	20.7	22.5	20.9	30.4
N.L.	29.1	22.1	24.1	29.8	26.8	25.8	26.6	27.6	15.7	25.8
Canada	34.5	33.4	31.1	31.4	31.4	29.6	29.6	26.3	26.7	29.0

Notes

Source

SECTION B-TREATMENT AND CHANGES

Canadian Organ Replacement Register, 2015, Canadian Institute for Health Information.

Table 2: CORR Report Table 7: Incident End Stage Disease Patients with Late Referral Status

one. Please	enter name and city of hospita	al for each transfer-in	and transfer-ou		ppropriate transfer, withdrew and died codes in column ides are listed below and are defined on the reverse.
	Treatment Location Type Care	DD MON	YYYY	Hospital Name	Major Reason for Change (See codes below.)
Last Treatment Information	Circle code.) (See codes below.)	L_ / /I.	_ _ _		Specify, if other.
Change 1	T R	<u> _ _ / _ _ / .</u>			
Change 2	T R	L_L_VLL_VI			
Change 3	T R	L_L_VLL_VI			
Change 4	T R	L_L_VLL_VI	_ _ _		
Change 5	T R	_ _ / _ _ /			

Figure 4: Section B—Treatment and Changes

^{*} Patients with a late referral status started dialysis less than 90 days after first seeing a nephrologist.

Data from Quebec was excluded from this table because of significant under-reporting between 2011 and 2014.

Another way that survival rates in dialysis patients are reported in CORR is by cause of ESKD, as seen in Figure 7.

From this figure we can see that patients with diabetes or renal vascular disease have higher mortality on dialysis than do those with polycystic kidney disease or glomerulonephritis.

CONCLUSION

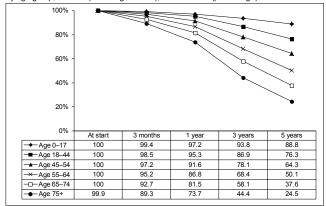
In summary, the information submitted by dialysis programs to CORR is invaluable and results in the reporting of statistical data that are used in numerous ways. For example, programs will use CORR data in proposal writing to support expansion and funding requests. News media will use CORR data to provide background statistics in news reporting, and individuals might use the data in scholarly manuscripts and research proposals. This discussion has demonstrated how the submission of information through the completion of registration and update forms is translated into statistical data in table format for quick access by renal programs and services. Together with CIHI, nursing is, therefore, having an impact on resources and services for patients in need.

SECTION C-CAUSE OF DEATH

If patient died, enter the cause of death. (See reverse for codes.)				
Specify, if other:	.			
Date of death: _ / _ _ _ (DD/MON/YYYY)				

Figure 5: Section C—Cause of Death

Figure 3 Unadjusted 3-month and 1-, 3- and 5-year survival rates in dialysis patients, by age group, Canada (excluding Quebec), 2005 to 2014 (percentage)

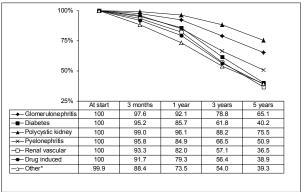


Data from Quebec was excluded from this figure because of significant under-reporting between 2011 and 2014 Source
Canadian Organ Replacement Register, 2015, Canadian Institute for Health Information

Treatment	Age group	At start	3 months	1 year	3 years	5 years
All dialysis	Age 0-17	100	99.4	97.2	93.8	88.8
	Age 18-44	100	98.5	95.3	86.9	76.3
	Age 45-54	100	97.2	91.6	78.1	64.3
	Age 55-64	100	95.2	86.8	68.4	50.1
	Age 65-74	100	92.7	81.5	58.1	37.6
	Δαρ 75+	90.0	80.3	73.7	44.4	24.5

Figure 6: CORR Report Figure 3: Unadjusted 3-month and 1-, 3-, and 5-year Survival Rates in Dialysis Patients, by Age Group, Canada (Excluding Quebec) 2005 to 2014

Figure 6 Unadjusted 3-month and 1-, 3- and 5-year survival rates in dialysis patients, by cause* of kidney failure, Canada (excluding Quebec), 2005 to 2014 (percentage)



Notes

* For a list of all primary diagnoses captured by CORR, see *Treatment of End-Stage Organ Failure in Canada, Canadian Organ Replacement Register, 2005 to 2014. Methodological Notes and Supplementary Information.

Data from Quebec was excluded from this figure because of significant under-reporting between 2011 and 2014.

Canadian Organ Replacement Register, 2015, Canadian Institute for Health Information.

Treatment	Cause of kidney failure	At start	3 months	1 year	3 years	5 years
All dialysis	Glomerulonephritis	100	97.6	92.1	78.8	65.1
	Diabetes	100	95.2	85.7	61.8	40.2
	Polycystic kidney	100	99.0	96.1	88.2	75.5
	Pyelonephritis	100	95.8	84.9	66.5	50.9
	Renal vascular	100	93.3	82.0	57.1	36.5
	Drug induced	100	91.7	79.3	56.4	38.9
	Other*	99.9	88.4	73.5	54.0	39.3
	Unknown	99.8	89.0	76.7	54.6	38.8

Figure 7: CORR Report Figure 6: Unadjusted 3-month and 1-, 3- and 5-year Survival Rates in Dialysis Patients, by Cause of Kidney Failure, Canada (Excluding Quebec) 2005 to 2014

REFERENCES

Canadian Institute for Health Information (2016). Canadian Organ Replacement Register. Treatment of end-stage organ failure in Canada, 2005 to 2014. Retrieved from https://www.cihi.ca/ sites/default/files/document/2016_corr_snapshot_enweb.pdf Kim, S.J. & Thomas, A. (2015). The Canadian Organ Replacement Register: Nursing's important contribution. Canadian Association of Nephrology Nurses and Technologists Journal, 25(4), 26.

THANK YOU TO OUR 2015 SPONSORS

PLATINUM











GOLD



SILVER





BRONZE









Connect with CANNT!



Toll-free 1-877-720-2819 or local 519-652-6767



519-652-5015



Canadian-Association-Of-Nephrology-Nurses-And-Technologists





CANNT National Office, PO Box 10, 59 Millmanor Place, Delaware, ON NOL 1E0





SHARON LAPOINTEMembership Coordinator **sharon@cannt.ca**



SUSAN MASON
Website and Social Media
susan@cannt.ca



HEATHER REID
National Administrator
heather@cannt.ca

CANNT Membership

First Name	☐ I have attained CNeph(C)	
Last Name	cdt designation	
Home Address	☐ I am a member of CNA	
City	Ontario applicants only	
Province Postal Code	Do you belong to RNAO? ☐ Yes ☐ No	
Telephone (H) (Professional Status	
(W) (Registered Nurse	
		e/Registered Nursing Assistant/
Email	Licensed Practical Nurse Technician	
Employer	☐ Technologist	
Employer Address	_	
City	Number of years in nephrolo	ogy
Province Postal Code	Area of responsibility	
Do you consent to the use of your name and address on mailing	☐ Direct Patient Care	☐ Teaching
lists that CANNT has considered pertinent and appropriate?	☐ Administration	☐ Research
☐ Yes ☐ No	☐ Technical	☐ Other (Specify)
Do you consent to the use of your email for all correspondence		
with CANNT? ☐ Yes ☐ No	Work environment	
	☐ Acute Care	☐ Independent Health Care
☐ New Member or ☐ Renewal	Self-Care Unit	☐ Private Sector
CANNT # (if renewal):	Highest level of education	1
Membership Fee (HST #100759869)	Nursing	Non-Nursing
Membership fee is tax deductible.	□ Diploma□ Baccalaureate	☐ Diploma ☐ Baccalaureate
☐ One Year: \$75.00 + HST/GST☐ Two Years: \$140.00 + HST/GST☐	☐ Master's	☐ Master's
☐ Student Rate: \$37.50 + HST/GST*	☐ Doctorate	Doctorate
*Proof of full-time enrolment must accompany application		
AB/BC/SK/MB/NT/NU/QC/YT: 5% GST; ON/NL/NB: 13% HST;	I am at present studying t	
PEI: 14% HST; NS: 15% HST	Nursing ☐ Specialty Certificate	Non-Nursing Specialty Certificate
I enclose \$	☐ Baccalaureate	☐ Baccalaureate
made payable to Canadian Association	☐ Master's	☐ Master's
of Nephrology Nurses and Technologists.	☐ Doctorate	☐ Doctorate
Method of payment: ☐ Cheque ☐ Money order ☐ Visa ☐ Mastercard	Primary area of practice	
Cardholder Name:	Choose one	
	□ Adults□ Combined Adult/Pediatri	☐ Pediatrics ics ☐ Other
Credit Card Number:		des Guiller
Expiry Date: 3-digit CVV code:	Select all that apply ☐ Full-Care Hemo	☐ Clinical Educator
Signature:	☐ Self-Care Hemo	Academic Educator
	☐ Home/Independent Hem	
Return to CANNT	☐ In-Patient Nephrology	☐ Vascular/Body Access
Mailing Address:	☐ In-Patient Peritoneal Dia	•
-	☐ In-Patient Transplantatio	-
CANNT, P.O. Boy 10, 59 Millmanor Place, Delaware, ON NOI 150	☐ Home/Independent PD	Administration
P.O. Box 10, 59 Millmanor Place, Delaware, ON NOL 1E0	Out-Patient Transplantat	tion 📮 Corporate Sales

Demande d'adhésion

Prénom	☐ J'ai obtenu la désignat	ion
Nom de famille	CNeph(C)/cdt	
Adresse à domicile	☐ Je suis membre de l'AC	
	Demandeurs de	
Ville	l'Ontario seulement	
Province Code postal	Faites vous partie de l'AOI	A?
Téléphone (D) (🗖 Oui 🗖 Non	
(T) ()	Statut professionel	
(1) (Infirmière(ier) autorise	ée(sé)
Courriel	Infirmière(ier) auxilair	e autorisée(sé) /
Employeur	infirmière(ier) auxilair	e
• ,	☐ Technicienne/technicie	en
Adresse de l'émployer	Technologue	
Ville	Autre (spécifier)	
Province Code postal	Années d'éxperience en né	éphrologie
	Domain de responsabili	ité
Adresse de correspondance 🚨 domicile 🖵 travail	☐ Soins directs	Enseignement
Acceptez-vous que l'ACITN ajoute votre nom et votre adresse sur	Administration	☐ Recherche
des listes d'envois qu'elle juge pertinentes et appropriées? $\hfill \Box$ Oui $\hfill \Box$ Non	☐ Technologie	☐ Autre (spécifier)
Avez-vous consentez à l'utilisation de votre e-mail pour toute		
correspondance avec l'ACITN?	Milieu de travail	
□ Oui □ Non	Soins actifs	Services de santé indépendants
☐ Nouveau membre ou ☐ Renouvellement	Unité d'autosoins	Secteur privé
	Plus haut niveau d'inst	ruction?
Numéro de l'ACITN (si renouvellement):	Infirmière(ier)	Autres
Frais d'adhésion (TPS #100759869)	☐ Diplôme	☐ Diplôme
Les frais d'adhésion sont deductibles d'impots.	Baccalauréat	☐ Baccalaureat
☐ Un an: 70,00 \$ + TVH/TPS	Maîtrise	Maîtrise
☐ Deux ans: 130,00 + TVH/TPS ☐ Tarif étudiant: 35,00 + TVH/TPS*	■ Doctorat	Doctorat
*La demande doit inclure une preuve d'inscription à plein temps	Je poursuis présenteme	ent des études
AB/BC/SK/MB/NT/NU/QC/YT: 5 % TPS; ON/NL/NB: 13 %	Domaine infirmière(ier)	
TVH; PE: 14 % TVH; NS: 15 % TVH	☐ Certificat	☐ Certificat
Je joins \$	■ Baccalauréat	☐ Baccalauréat
payable à l'ACITN.	☐ Maîtrise	☐ Maîtrise
	Doctorat	☐ Doctorat
Mode de paiement: ☐ Chèque ☐ Mandat de poste ou chèque visé	0 . 1	
☐ Visa ☐ Mastercard	Secteur de pratique spé	
	☐ Insuffisance rénale pro	gressive (pre-dialyse)
Nom du titulaire de la carte:	☐ Transplantation	
Numéro de la carte:	HémodialysePéritonéale	
Date d'expiration:	☐ Pédiatrie	
-	☐ Autre (spécifier)	
Signature:	- mare (specifici)	

Poster à **ACITN** *Adresse postale*:

CANNT/ACITN

P.O. Box 10, 59 Millmanor Place, Delaware, ON NOL 1E0 Téléphone (519) 652-6767 Télécopieur (519) 652-5015