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1. Renagel* product monograph, Genzyme Canada, October 2007







CANNT JOURNAL **JOURNAL ACITN**

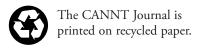


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The CANNT Journal

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Contributing to our mosaic of renal care



Once again it is time for CANNT to celebrate CANNT's accomplishments at the upcoming CANNT conference. Without your support, CANNT would not be able to

maintain the professionalism that we have attained, and keep moving onward into the second decade of this 21st century.

In recognition of the upcoming CANNT conference, to be held in Toronto, November 18-20, 2010, we present in this issue (pages 16 to 34) an impressive 54 abstracts accepted as oral or poster sessions for this conference. The topics in this year's abstracts are quite diverse, representing a true "Mosaic of Renal Care," the theme for this year's conference. Again, the Toronto volunteer planning committee, along with Heather Reid, our conference planner, has done a superb job of putting together another exciting conference. Indeed, there should be something for everyone.

Also in this issue, we have the results of a fascinating research study by Barb Wilson and her colleagues at London Health Sciences Centre, London, Ontario. The research is entitled "The culture of vascular access cannulation among nurses in a chronic hemodialysis unit." Barb was successful in obtaining research funding for this study from a CANNT 2008 Research Grant. The nurse researchers found hemodialysis nurses today have fewer opportunities to become "expert" cannulators and

there is a new need for educational opportunities to help develop nurses' skills in cannulation.

Another research study published in this issue is by Marjolaine Merlin and Gemma Gallant, from the Université de Moncton, Moncton, New Brunswick. Their research study is entitled "Effet d'un programme de gestion de la fatigue auprès des personnes hémodialysées." We are pleased to have a publication submitted in the French language and trust that the publication of this excellent research study will encourage other French-speaking Canadian nephrology nurses and technologists to also submit articles to the CANNT Journal in the French language.

Our pharmacy journal editorial board member Colette Raymond and her colleagues from Winnipeg Health Sciences Centre have written another excellent continuing education (CE) article on "The treatment of hyperkalemia in patients with chronic kidney disease—A focus on medications." As the authors point out, the consequences of hyperkalemia for our patients on dialysis can be quite severe and even life threatening. We trust that nurses who have just started in dialysis will find new information in this article, and more experienced nurses will find it an excellent review of such an important topic.

We look forward to meeting as many of you as possible at the upcoming CANNT conference in Toronto. Please don't hesitate to introduce yourself to me, Gillian Brunier–Editor of the CANNT Journal, if you feel you have something to share with other CANNT Journal readers and contribute to our mosaic of renal care in Canada.

Contribuer à la mosaïque des soins rénaux

C'est de nouveau le temps pour l'Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN) de souligner ses réalisations au cours de son Congrès annuel qui aura lieu très prochainement. Sans votre appui, l'ACITN ne pourrait maintenir le degré de professionnalisme qu'elle a atteint et qui lui permet d'aller de l'avant à l'aube de cette deuxième décennie du 21^e siècle.

Afin de vous donner un aperçu de prochain Congrès annuel de l'ACITN, qui aura lieu à Toronto, du 18 au 20 novembre 2010, nous vous présentons dans ce numéro un nombre impressionnant de 54 résumés, triés sur le volet et acceptés à titre de communications orales ou d'affiches scientifiques. Cette année, les résumés portent sur des sujets très variés, formant du même souffle une véritable « mosaïque des soins rénaux », soit le thème du Congrès de 2010. Une fois de plus, les membres du Comité de planification de Toronto, accompagnés d'Heather Reid, planificatrice d'événements, ont fait un superbe travail en organisant un autre congrès tout à fait passionnant. En effet, tout un chacun y trouvera son petit quelque chose-un élément de cette riche mosaïque.

Également dans ce numéro, nous dévoilons les résultats d'une étude de recherche fascinante menée par Barb Wilson et ses collègues du London Health Sciences Centre, de London, en Ontario. La recherche s'intitule « The culture of vascular access cannulation among nurses in a chronic hemodialysis unit » [La culture entourant le piquage de l'accès vasculaire chez les infirmières œuvrant dans une unité d'hémodialyse chronique]. Barb s'est méritée une bourse de recherche de l'ACITN en 2008 pour entreprendre cette étude. Les infirmières chercheuses ont constaté que les infirmières d'hémodialyse aujourd'hui ont moins d'occasions de devenir des « expertes » en piquage et qu'un réel besoin en formation se fait sentir afin de développer les habiletés associées à la technique de piquage.

Nous vous présentons également dans ce numéro une autre étude de recherche menée par Marjolaine Merlin et Gemma Gallant, de l'Université de Moncton, à Moncton, au Nouveau-Brunswick, qui s'intitule « Effet d'un programme de gestion de la fatigue auprès des personnes hémodialysées » [Impact of a fatigue management program in hemodialyzed patients]. Nous avons le grand plaisir de vous offrir cet article rédigé et soumis en français et espérons que la publication des résultats de cette excellente étude incitera les infirmières, les infirmiers et les technologues francophones de néphrologie au Canada à soumettre des articles pour une publication en français dans le Journal de l'ACITN.

Colette Raymond, pharmacienne et membre du Comité de rédaction du Journal de l'ACITN, signe, en collaboration avec ses collègues du Winnipeg Health Sciences Centre, un autre excellent article d'éducation continue portant sur le traitement pharmacologique de l'hyperkaliémie chez les patients atteints de maladie rénale chronique et s'intitulant « The treatment of hyperkalemia in patients with chronic kidney disease—A focus on medications ». Comme le soulignent les auteures, l'hyperkaliémie peut entraîner chez les patients dialysés des conséquences graves, voire menaçant le pronostic vital. Nous sommes persuadées que les infirmières qui commencent leur carrière en dialyse puiseront dans cet article une information nouvelle et que les infirmières chevronnées constateront qu'il offre une excellente revue sur un sujet d'une aussi grande importance.

J'anticipe donc avec joie de vous rencontrer en grand nombre au prochain Congrès annuel de l'ACITN à Toronto. N'hésitez pas à venir me parler si vous croyez détenir un sujet d'article à partager avec les lecteurs de notre Journal et désirez ainsi contribuer à notre Mosaïque des soins rénaux au Canada.

Le Journal ACITN

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

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Message from the President

Sharing information to improve patient outcomes



When I first started my career in nephrology many years ago, I remember feeling like we worked in isolation. My world revolved around what was happening in the unit I was work-

ing in. Once a year someone would come back from the CANNT conference and would fill us in on what was happening outside our unit. In some respects, we seemed slow to change any of our policies and procedures, because we had limited exposure to alternative practice and evidence-based research. Why change something that wasn't broken?

Today, I find it's just the opposite. We're constantly revising protocols and procedures trying to optimize our patients' treatments to improve their quality of life. So what's changed?

I believe our opportunities to share information with each other, through improved communication tools, have dramatically increased. The invention of e-mail via the internet, webinars and teleconferencing has made the oncelaborious task of sharing information as easy as clicking on a button.

The sharing of information can be seen in some of the provinces, Ontario, Manitoba, Alberta and British Columbia, developing provincial patient databases in order to standardize treatments and streamline funding modules for better patient outcomes.

Nurses and technologists have also embraced this new technology to share information with each other. Local, provincial and national groups are now working together to share research, to poll frequently asked questions, question historical practice, and standardize protocols and procedures.

CANNT has also looked for opportunities to improve communication and share information with our membership. In the past two years, CANNT has established formalized partnerships with our sister organizations: the European Dialysis

and Transplant Nurses Association (EDTNA), The American Nephrology Nurses Association (ANNA) and the National Association of Nephrology Technicians/Technologists (NANT).

We've also improved our website, making it easier for our membership to access information such as the CANNT Journal. Mass e-mails keep membership informed of upcoming conferences, access to bursaries, awards and elections. CANNT provides our conference delegates and our membership at large educational opportunities such as preparing to write for their nephrology certification through preparatory workshops and online, voice-over teaching modules. We continue to collaborate with the Canadian Nurses Association (CNA) to improve services.

Three years ago, CANNT recognized the need to provide a venue for communication to specialized groups within nephrology. From this need, refined clinical practice groups (RCPGs) were formed. The first group established was the Canadian Hemodialysis Access Coordinators. Now, the Peritoneal Dialysis Nurses and the Renal Administrator Leader Network of Ontario (RALNO) are also expressing interest. CANNT provides these groups internet access through the CANNT website to facilitate the ability to pose questions and share information to group members, as well as providing a meeting place at the annual symposium with the ultimate objective to improve nephrology patient care.

Take the opportunity to check out the new and improved CANNT website: www.cannt.ca

Come to the conference in Toronto this November. Seek out and share information with fellow delegates. Think about joining or establishing a refined clinical practice group in your area of expertise. Take the opportunity to collaborate with others throughout the country and give yourself the opportunity to improve your patients' outcomes.

Rick Luscombe, RN, BSN, CNeph(C) CANNT President

Échanger de l'information pour améliorer la santé des patients

Lorsque j'ai commencé ma carrière en néphrologie, il y a de nombreuses années, j'avais l'impression de travailler dans l'isolement. Mon univers gravitait autour de ce qui se passait dans l'unité de soins. Une fois par année, quelqu'un revenait du congrès de l'Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN) et nous transmettait ce qui se passait à l'extérieur de notre unité. À certains égards, il me semblait que nous étions lents à changer nos politiques et procédures, étant donné que nous avions un accès limité aux autres pratiques et à la recherche fondée sur l'expérience clinique. Pourquoi changer ce qui fonctionnait?

Aujourd'hui, je trouve que c'est tout le contraire. Nous sommes constamment en train de réviser nos protocoles et procédures en essayant d'optimiser les traitements de nos patients afin d'améliorer leur qualité de vie. Alors, qu'est-ce qui a changé?

Je crois que les occasions d'échanger de l'information avec les autres, grâce aux outils de communication améliorés, se sont accrues considérablement. L'invention du courriel, en passant par l'internet, les séminaires en ligne et la téléconférence, a rendu la tâche autrefois laborieuse de cueillette et de transmission de l'information aussi facile qu'un clic de souris.

On constate un échange d'information dans certaines provinces, telles que l'Ontario, le Manitoba, l'Alberta et la Colombie-Britannique, qui établissent des bases de données provinciales sur les patients afin de normaliser les traitements et de rationaliser les modules de financement pour améliorer l'état de santé des patients. Les infirmières, les infirmiers et les technologues ont également adopté cette nouvelle technologie pour échanger de l'information entre eux. Des groupes à l'échelle régionale, provinciale et nationale œuvrent maintenant ensemble pour communiquer leurs résultats de recherche; unissent leurs efforts pour répondre aux questions les plus fréquemment posées; remettent en question la pratique historique et contribuent à la normalisation des protocoles et des procédures.

L'ACITN a également cherché des occasions pour améliorer la communication et l'échange d'information avec ses membres. Au cours des deux dernières années, l'ACITN a créé des partenariats stratégiques avec ses organisations

sœurs: European Dialysis and Transplant Nurses Association, American Nephrology Nurses Association et National Association of Nephrology Technicians/Technologists.

Nous avons également amélioré notre site Web afin de faciliter l'accès à l'information pour nos membres, comme la mise en ligne du Journal de l'ACITN. La diffusion massive de courriels permet d'informer nos membres de la tenue de conférences, de remises de bourses et de prix, d'élections, etc.

L'ACITN offre à ceux et celles qui participent au congrès annuel et à ses membres en général des occasions d'éducation comme la préparation à l'examen d'agrément des soins infirmiers en néphrologie par des ateliers préparatoires et des modules d'apprentissage en ligne, avec narration hors-champ. Nous continuons de collaborer avec l'Association des infirmières et infirmiers du Canada (AIIC) afin d'améliorer nos services.

Il y a trois ans, l'ACITN a reconnu le besoin de fournir un lieu commun de communication pour des groupes spécialisés en néphrologie. À la lumière de ceci, des groupes de travail sur la pratique clinique ont été formés. Le premier groupe mis sur pied a été celui des coordonnateurs d'accès en hémodialyse du Canada, maintenant connu sous l'appellation des infirmières et infirmiers de dialyse péritonéale. Les directeurs administratifs du Réseau rénal de l'Ontario ont également signalé leur intérêt. L'ACITN offre à ces groupes un accès internet, par son site Web, pour faciliter l'affichage de foires aux questions et l'échange d'information à leurs membres et fournit une occasion de rencontre dans le cadre de son congrès annuel avec l'objectif ultime d'améliorer les soins prodigués aux patients en néphrologie.

Profitez de l'occasion pour visiter le nouveau site Web amélioré de l'ACITN : www.cannt.ca

Soyez du Congrès annuel de l'ACITN à Toronto, en novembre prochain. Venez recueillir et échanger de l'information avec vos collègues. Joignez-vous à un groupe de travail sur la pratique clinique dans votre domaine d'expertise ou encore fondez-en un. Saisissez l'occasion de collaborer avec d'autres membres d'un bout à l'autre du pays et d'améliorer la santé de vos patients.

Rick Luscombe, inf., B.Sc.inf., CNéph(C) Président de l'ACITN

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Your board in action



By Jan Baker, CANNT Past President

The purpose of this article is to keep all members informed of the activities with which the board of directors is involved. We will update you on what's new within our organization and upcoming activities as well as important dates to remember.

The 2010 Spring CANNT Board of Directors' meeting was held by teleconference in April this year.

Membership

- At present we have approximately 650 members of CANNT. The board is always looking at ways to encourage long-term membership, as numbers can fluctuate greatly due to symposium locations. The membership form was revised this year.
- We encourage everyone to use the website to sign up or renew their membership online, which provides not only a cost savings to the organization, but also saves paper. I did it this year and it couldn't have been easier.
- We would also encourage members to maintain a yearly membership versus renewing at conference time. This provides you with copies of the CANNT Journal as well as helping to maintain professional development and the long-term viability of the organization.

Finances

- The board of directors is continuously watching all expenditures, as well as encouraging new revenue streams. One way the board of directors has made a change this year was to hold our spring meeting via teleconference versus a face-to-face meeting. We were able to accomplish our agenda, as well as save costs of travel and accommodation.
- Another way that we tried to trim costs this year was to hold elections online for the first time, thereby saving time, postage and paper. Stay tuned for upcoming election information and remember your vote is crucial.

 We are forever grateful to our corporate sponsors who, as always, are to be thanked for their ongoing support of CANNT, including the annual symposium and journal awards and bursaries.

Strategic planning

• The board of directors continues to focus on our present strategic plan, which was constructed in 2007 and will guide activities until 2013. Our main goals continue to focus on the following: communication, membership, education, professional practice, research, partnerships and maintaining the viability of our association. We will be reviewing our process and accomplishments at the fall board of directors' meeting and update all members during the annual CANNT conference and in the CANNT Journal.

Journal

- The CANNT Journal is a peerreviewed journal that is published quarterly. It continues to be a resource for nephrology professionals and is indexed through CINAHL, MED-LINE and OVID databases.
- We are always looking for authors to publish articles in both French and English. For first-time authors, information on publishing is available on our website. You can also contact our Editor, Gillian Brunier, at gillianbrunier@sympatico.ca
- This year's winner of the CANNT Journal Award will be announced at our annual conference in November. 2010.

Website

- The website continues to grow and provide increased opportunities. We held our first elections online this year and will continue to do so.
- We would like to encourage all members to renew online. It's fast and economical, as well as environmental.
- Watch for posted career opportunities as well.

Communication

- Communication continues to be a priority to the board of directors. We want the channels of communication to be open to all members, so keep using the toll-free number, as well as the CANNT website to contact us with any questions or concerns. We are very open to new ideas from our members regarding ways to improve our service, as well as ideas regarding nephrology activities.
- We have used e-mail blasts to get information out to all members, as well as relying on our unit liaisons and regional VPs. Regional activities are posted online, so stay tuned.
- Communication with our corporate sponsors is also a priority for the board of directors. This year we introduced a new format to evaluate how satisfied our sponsors are. The members of the board of directors circulated during the annual conference and spoke to sponsors, as well as having them fill out a revised evaluation form.
- Refined clinical practice groups are still being worked on. Stay tuned to the website for updates on what is available within speciality areas.
- Partnerships continue to flourish and broaden our communication pathways. One such communication took place when we signed the Declaration of Istanbul calling for an end to unethical transplant practices worldwide.
- The signing of a collaborative agreement with the European Dialysis and Transplant Nurses Association (EDTNA) was another highlight last year. This made us think of our many professional relationships and ways to solidify our partnerships. We are working at present with the American Nurses Association Nephrology (ANNA) and the National Associaof Nephrology Technicians/Technologists (NANT) to formalize our present relations with these organizations.

CANNT office operations

- The contract for the Administrative Assistant, Debbie Maure, was renewed following completion of a performance review by the board of directors in October 2009.
- The evaluation format used for our Conference Planner, Heather Reid, was revised and reviewed by the board of directors at this year's board of directors' meeting.
- The board of directors will also be reviewing/revising the bylaws in 2010.
 They will be reviewed and voted upon at the fall symposium.

Standards of practice

- The standards review committee has put forth an invitation for any interested parties to take part in the review that will happen in 2010. Please consider taking part—you can notify your intent by contacting our national office via toll-free number or by the website (1-877-720-2819; Website: www.cannt.ca)
- Standards of practice, both nursing and technological standards, continue to be available on our website.

Awards of excellence and bursaries

- Information on all awards and bursaries available through CANNT are found on the website, as well as in the CANNT Journal. The deadline for 2010 has passed and those being awarded will be notified and presented at the Toronto CANNT conference.
- I would encourage all members to apply for the available awards. There were awards not applied for in past years and it would be wonderful to hand them all out.

Nominations committee

 The call for nominations has gone out and information regarding elections will be sent to members, as well as posted online. The new board of directors will be announced in Toronto at our annual symposium.

Canadian Nurses Association (CNA)

- The numbers of nurses certified in nephrology grow yearly. There are now 1,103 nurses in Canada who are certified, up from 963 in 2005. I think this speaks to the professionalism of all nephrology nurses. Congratulations to all of the nurses who achieved their certification this year.
- Rick Luscombe, our president, will once again present a pre-symposium workshop on preparing for and writing the CNA exam. His presentation is also available to members on the CANNT website.
- As the CNA representative for CANNT,
 I have joined in on all teleconferences
 where nursing issues across specialties
 within Canada are discussed. It is a fabulous forum for the sharing of information and solutions. I was also asked
 to participate in a teleconference with
 CNA during which issues particular
 to nephrology nursing were discussed.

Nephrology Health Care Professionals Day: September 15, 2010

Last year was the first year that we celebrated in a truly multidisciplinary fashion. CANNT organized and distributed posters to help each unit celebrate this wonderful day in partnership with the Canadian Association of Nephrology Social Workers (CANSW),

- Canadian Association of Nephrology Dietitians (CAND), the Renal Pharmacists Network (RPN) and, this year, the Canadian Society of Nephrology (CSN).
- We will be sending out information and posters this year, as well. Think of new ways to celebrate our day and let us know at CANNT how you did this.

2010 Annual Symposium: November 18–20, 2010, Toronto, Ontario

• The Toronto organizing committee is hard at work planning for our arrival. This committee has been working hard not only during teleconferences and e-mails, but has also had face-toface meetings in which they are planning a fantastic conference with topics to meet all needs. I was able to go to Toronto for their face-to-face meeting in which the agenda was organized. Lots of work and I can't wait to attend. This year's theme is "Our Mosaic of Renal Care". A new format for our annual symposium is being rolled out this year: a full day Thursday, Friday and Saturday, thus leaving Sunday for some extra sight-seeing or travelling home. I would encourage all presenters to consider publishing in the CANNT Journal once they have presented.

It has been a very busy, but productive year for CANNT, and your CANNT Board of Directors continues to promote and develop CANNT as the voice of nephrology nursing in Canada. CANNT is your organization and I would encourage you to give us your feedback, as well as possibly becoming involved with the board of directors. Our next board of directors' meeting will be held in November 2010.

• Are you moving? Let us know. In order to ensure uplease indicate corrections or a change of address a 336 Yonge St., Barrie, Ontario, L4N 4C8.			
• Déménagez-vous? Avertissez nous. Afin d'assurer la livraison ininterrompue de votre journal de l'ACITN ainsi qu'autre correspondance, veuillez indiquer toute correction ou changement d'adresse à l'association aussitôt que possible en complétant ce formulaire et le poster à: Debbie Maure, ACITN, Suite 322, 336 Yonge St., Barrie, Ontario, L4N 4C8			
Name/Nom:	Moving Date/Date de déménagement:		
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Votre conseil en action



Par Jan Baker, présidente sortante de l'Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN)

Le présent article consiste à vous informer sur les activités mises de l'avant par votre conseil d'administration (CA). Nous désirons vous présenter les nouvelles en bref de votre Association, les prochaines activités ainsi que les dates importantes à retenir. La réunion printanière de 2010 du CA de l'ACITN s'est tenue par conférence téléphonique en avril dernier. Voici les points saillants de cette réunion :

Adhésion

- Nous comptons actuellement 650 membres. Le CA est constamment à la recherche de façons nouvelles d'encourager l'adhésion des membres à long terme, étant donné que l'effectif peut fluctuer grandement d'une année à une autre, en raison de l'emplacement du congrès annuel. Nous avons procédé à la révision du formulaire d'adhésion cette année.
- Nous invitons toutes les personnes qui s'inscrivent ou tous les membres qui renouvellent leurs cotisations à le faire en ligne, ce qui est non seulement rentable pour l'Association, mais permet aussi d'épargner du papier. J'ai moi-même renouvelé mon adhésion en ligne, et ce fut un jeu d'enfant!
- Nous aimerions aussi encourager les membres à renouveler leur adhésion annuellement au lieu de le faire au moment du congrès. En adhérant à l'ACITN, vous recevrez le Journal de l'ACITN (Journal CANNT) et vous aidez ainsi à maintenir le perfectionnement professionnel et la viabilité à long terme de notre organisation.

Finances

 Le CA surveille constamment toutes les dépenses et est toujours à l'affût de nouvelles sources de revenus. Un des changements pilotés par le CA cette année a été de tenir la réunion printanière par conférence téléphonique au

- lieu d'une rencontre en personne. Nous avons passé en revue l'ordre du jour, tout en économisant en frais de déplacement et d'hébergement et (ou) de repas.
- Nous avons également réduit nos dépenses d'exploitation cette année en tenant des élections en ligne pour la première fois, ce qui nous a permis d'économiser en temps, frais postaux et papier. L'information relative aux élections sera affichée sous peu sur notre site Web; votre vote est crucial.
- Nous tenons à remercier très sincèrement nos sociétés commanditaires qui, comme toujours, continuent d'appuyer nos activités, incluant le congrès annuel, le journal ainsi que les différents prix et bourses.

Planification stratégique

• Le CA continue d'axer ses efforts sur un plan stratégique qui été élaboré en 2007 et qui guide nos activités jusqu'en 2013. Nos principaux objectifs portent notamment sur les secteurs suivants : communication, adhésion, éducation, pratique professionnelle, recherche, partenariat et maintien de la viabilité de notre Association. Nous passerons en revue notre processus et nos réalisations durant la réunion automnale du CA et présenterons un compte rendu à tous nos membres au cours du congrès annuel et dans le Journal de l'ACITN.

Journal

- Le Journal de l'ACITN est une publication révisée par des collègues qui est publiée trimestriellement. Cette source d'information est prisée par les professionnels en néphrologie et est indexée dans les bases de données suivantes : Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE et OVID.
- Nous sommes toujours à la recherche d'auteurs francophones et anglophones. Les auteurs peuvent consulter en ligne l'information relative à la publication de leurs articles. Vous pouvez également communiquer avec

l'éditrice en chef, Gillian Brunier, à gillianbrunier@sympatico.ca.

• Le nom du ou de la récipiendaire du Prix d'excellence de 2010 sera dévoilé pendant le congrès annuel qui aura lieu en novembre.

Site Web

- Notre site Web prend de l'expansion et nous permet d'explorer de nouvelles possibilités. Nous avons tenu nos premières élections en ligne en 2009 et nous continuerons de privilégier ce moyen.
- Nous invitons tous les membres à renouveler leurs cotisations en ligne, ce qui est plus rapide, plus économique et également plus écologique.
- Surveillez aussi les offres d'emploi qui sont hébergées sur le site Web.

Communication

- La communication est toujours une priorité pour le CA. Nous désirons que les voies de communication demeurent accessibles à tous les membres. Nous vous invitons à continuer d'utiliser le numéro sans frais (1-877-720-2819) ainsi que le site Web de l'ACITN pour nous joindre afin de nous transmettre vos questions ou vos commentaires. Nous sommes très ouverts à de nouvelles idées soumises par nos membres quant aux façons d'améliorer nos services et aux suggestions d'activités en néphrologie.
- Pour informer tous les membres, nous avons envoyé maints messages électroniques et avons compté sur le soutien des agents de liaison et des vice-présidents (v.-p.) régionaux. Une liste des activités régionales est affichée en ligne. Consultez régulièrement le site Web.
- La communication avec nos sociétés commanditaires demeure une priorité pour le CA. Nous avons présenté un nouveau formulaire pour évaluer le niveau de satisfaction de nos commanditaires. Lors du dernier congrès annuel, les membres du CA se sont promenés et ont discuté avec les commanditaires et leur ont demandé de remplir le formulaire d'évaluation révisé.

- Des groupes de discussion sur la pratique clinique continuent de se réunir.
 Surveillez le site Web pour les mises à jour sur ce qui est accessible dans votre domaine de spécialité.
- De nouveaux partenariats continuent de se former et d'élargir nos voies de communication, une telle communication a eu lieu lorsque nous avons signé la Déclaration d'Istanbul, exigeant la fin de pratiques douteuses relatives à la transplantation à l'échelle mondiale.
- La signature d'une entente de collaboration avec la European Dialysis and Transplant Nurses Association (EDTNA) a été un événement marquant cette année. Cela nous a amenés à reconsidérer nos nombreuses relations professionnelles et aux façons de solidifier nos partenariats. Nous travaillons actuellement avec l'American Nurses Association Nephrology (ANNA) et la National Association of Nephrology Technicians/Technologists (NANT) pour officialiser nos relations actuelles avec ces organisations.

Services administratifs

- Nous avons renouvelé le contrat de l'assistante administrative, Debbie Maure, après l'évaluation de son rendement par le CA en octobre 2009.
- Le format d'évaluation utilisé par notre planificatrice de congrès, Heather Reid, a été revu et corrigé par le CA lors de l'assemblée de cette année.
- Le CA révisera et mettra à jour ses règlements administratifs en 2010. Ces derniers seront passés en revue et votés au cours du congrès cet automne.

Normes de la pratique

- Le Comité de révision des normes de pratique lance une invitation à toute personne désireuse de prendre part au processus de révision qui aura lieu en 2010. Envisagez-vous de collaborer à ce processus? Dans l'affirmative, veuillez signifier votre intention en communiquant avec le bureau national par téléphone au numéro sans frais (1-877-720-2819) ou par le site Web: www.cannt.ca
- Les normes de pratique infirmière et de pratique technique sont accessibles en ligne sur notre site Web.

Prix d'excellence et bourses

 Vous trouverez toute l'information sur les prix et bourses sur le site Web de l'ACITN ainsi que dans le Journal de l'ACITN. La date limite d'inscription

- était le 1er mai 2010. Les récipiendaires de prix ou de bourses seront informés et présentés au cours du congrès annuel de l'ACITN à Toronto.
- Je tiens ici à encourager tous les membres à poser leur candidature pour les prix offerts. Certains prix ou certaines bourses n'ont pas reçu de mise en candidature cette année et ce serait formidable de pouvoir tous les remettre.

Comité des mises en candidature

 Un appel de mises en candidature ainsi que toute l'information utile sur les élections ont été envoyés à tous les membres et affichés en ligne. Le nouveau CA de l'ACITN sera présenté au cours du congrès annuel de l'ACITN à Toronto.

Association des infirmières et infirmiers du Canada (AIIC)

- Le nombre d'infirmières et d'infirmiers agréés en néphrologie augmente d'année en année. Plus de 1 103 infirmières et infirmiers ont été agréés en soins infirmiers en néphrologie au Canada comparativement à 963 en 2005. Je pense que cela reflète le professionnalisme des infirmières et infirmiers de néphrologie. Félicitations à ceux et celles qui ont obtenu leur agrément cette année!
- Rick Luscombe, notre président, donnera de nouveau un atelier de préparation pour passer l'examen d'agrément CNépho(C) de l'AIIC en avant-première du congrès de l'ACITN de 2010; les membres peuvent consulter sa présentation en ligne sur le site Web de l'Association.
- En tant que représentante de l'ACITN à l'AIIC, je me suis jointe à toutes les conférences téléphoniques au cours desquelles les enjeux en soins infirmiers dans toutes les spécialités au Canada ont été abordés. Il s'agit d'une plateforme fabuleuse pour échanger de l'information et des solutions. On m'a également demandé de prendre part à une téléconférence de l'AIIC portant sur les enjeux particuliers aux soins infirmiers en néphrologie.

Journée annuelle des professionnels de la santé en néphrologie : le 15 septembre 2010

 L'année dernière, nous avons célébré la première Journée annuelle des professionnels de la santé en néphrologie d'une manière vraiment multidisciplinaire. L'ACITN a préparé et distribué des affiches afin d'aider chaque unité de dialyse à souligner cette merveilleuse journée. Des collègues de la Canadian Association of Nephrology Social Workers (CANSW), de la Canadian Association of Nephrology Dietitians (CAND), du Renal Pharmacists Network (RPN) et de la Société canadienne de néphrologie (SCN) se sont joints à nous dans l'organisation et la promotion de cette journée.

 Nous enverrons de l'information et des affiches cette année encore. Pensez à de nouvelles façons de célébrer cette journée et envoyez-nous un compte rendu des activités que vous aurez organisées.

Congrès annuel de 2010 : du 18 au 20 novembre 2010, à Toronto, en Ontario

• Le Comité organisateur travaille d'arrache-pied à la planification de notre participation au congrès annuel de l'ACITN. Participant non seulement à des conférences téléphoniques et à des échanges de courriels, les membres de ce comité ont également tenu des réunions en personne au cours desquelles ils ont préparé un congrès fantastique comportant des sujets qui répondent à tous les besoins. J'ai pu me joindre à leur réunion qui s'est déroulée à Toronto et durant laquelle l'ordre du jour du congrès a été dressé. Beaucoup de travail a été accompli et j'attends avec impatience de participer à ce congrès. Le thème retenu est : Notre mosaïque des soins rénaux. Cette année, le congrès prend un nouveau format : journées pleines du jeudi au samedi, laissant la journée de dimanche pour visiter ou retourner à la maison. J'encourage tous les conférenciers à envisager de publier dans le Journal de l'ACITN à la suite de leur communication orale dans le cadre du congrès.

Ce fut une année de grande activité, mais très productive pour l'ACITN. Votre CA continue de promouvoir et de développer l'ACITN comme la voix des soins infirmiers en néphrologie au Canada. L'ACITN est votre Association. Nous serions heureux de recevoir vos commentaires et surtout votre candidature à l'un des postes vacants au sein du CA. La prochaine réunion du CA aura lieu en novembre 2010.

Canadian Institute for Health Information

Organ donation in Canada is up, but still not meeting the demand

By Colleen Wile, RN, CNeph(C), Clinical Nurse Educator, Community Dialysis, Halifax, Nova Scotia

According to Canadian Institute for Health Information (CIHI), in a report published in December 2009, despite an increase of 28% in the availability of donated organs over the last decade, it is not keeping up with the demand for organs in Canada. The demand for organs is increasing due to the increasing numbers of Canadians with organ failure and the associated medical advancements that are keeping these patients alive longer (CIHI, 2009).

The gap between supply and demand is increasing for kidney transplants according to the CIHI's study, *Organ Donor Activity in Canada*, 1999 to 2008. The last 10 years have seen a decline in the number of kidney transplants in relationship to the number of patients with kidney failure. In 2008, there were six kidney transplants per 100 patient years of dialysis, while in 1999 there were eight kidney transplants per 100 patient years of dialysis (CIHI). Jean-Marie Berthelot, Vice-President of Programs at CIHI, cites the rise in demand is related, in part, to the rise of diabetes-related

kidney failure cases in Canada (CIHI, 2009). Berthelot (CIHI, 2009) reports that with obesity on the rise in Canada, the number of new patients with end stage renal disease associated with diabetes has risen from approximately 1,000 new cases in 1996 to nearly 1,900 new cases in 2008 (see Figure 1).

Over eight years, the increase in the availability of donor organs has come from living donors. A living donor can only donate one organ or part of a lung or liver and are most commonly used for kidney transplantation. The rate of deceased donor organ donation has not increased significantly over the same timeframe. A deceased donor can provide up to six organs for transplant. However, in 1998, on average 3.6 organs per deceased donor were transplanted (CIHI, 2009).

Dr. John Gill, Associate Professor of Medicine, University of British Columbia—Division of Nephrology at St. Paul's Hospital in Vancouver, explains, "The need for transplantable organs has never been greater. The option of organ and tissue donation should be offered to all patients who die in Canadian hospitals and should be incorporated as an essential component of end-of-life care."

In 2008, about 215 Canadians died while waiting for an organ transplant. CIHI reported that during 2008, in Canada there were 2,080 solid organ transplants. Transplants included kidney (1,216), liver (453), lung (165), heart (164) and pancreas (82).

For more information on Organ donation and on the CIHI's study, Organ Donor Activity in Canada, 1999 to 2008 visit CIHI's website: http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=media_20091222_e

CIHI also released a report, *Treatment of End-Stage Organ Failure in Canada*, 1999 to 2008, in March 2010 showing that more than 36,600 Canadians by the end of 2008 were living with end stage renal disease. This represented an increase of 57% since 1999. The report showed that about three out of five of these patients (21,754) were on dialysis and two out of five (14,884) were living with a functioning kidney transplant.

For more information on the 2010 CORR report, *Treatment of End-Stage Organ Failure in Canada*, 1999 to 2008, visit CIHI's website at http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=PG_2790_E&cw_topic=2790&cw_rel=AR_5_E

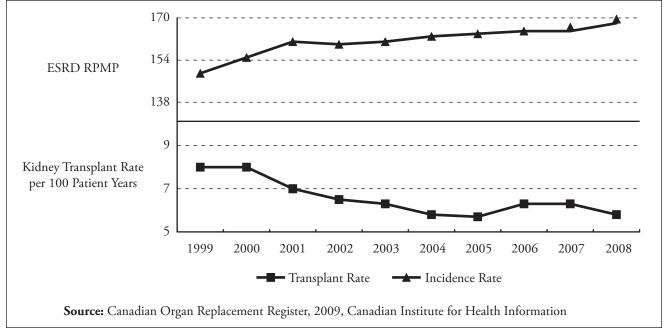


Figure 1. Incidence of end-stage renal disease rate per million population and kidney transplants per 100 patient years of dialysis, Canada, 1999 to 2008

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NOTICE BOARD

- Ottawa Supper Clubs- Contact Janet Graham, Nephrology Unit, Ottawa Hospital, jgraham@ottawahospital.on.ca
- * September 1–October 15, 2010. Registration time for the Nephrology Certification Exam. Contact Canadian Nurses Association Certification Program, e-mail: lvachon@cna-aiic.ca Website: www.cna-aiic.ca. Toll-free phone number: 1-800-450-5206
- * October 15, 2010. Deadline for applications for Allied Health Research Grants, Kidney Foundation of Canada. Website: www.kidney.ca
- * November 18–20, 2010. CANNT 43rd National Symposium. Metro Toronto Convention Centre, Toronto, Ontario. Conference Planner: Heather Reid: e-mail: hreid@innovcc.ca. Website: www.cannt.ca
- February 20–22, 2011. 31st Annual Dialysis Conference. Phoenix, Arizona. Website: www.som.missouri.edu/Dialysis/
- * March 10, 2011. World Kidney Day. A joint initiative of the International Society of Nephrology and the International Federation of Kidney Foundations. Website: www.worldkidneyday.org
- * March 15, 2011. Kidney Foundation of Canada. Deadline for Allied Health Fellowships and Scholarships. Contact: Coordinator, Research Grants and Awards, 1-800-361-7494, ext. 232, E-mail: research@kidney.ca. Website: www.kidney.ca
- * March 27–30, 2011. The American Nephrology Nurses Association (ANNA) 42nd National Symposium, Sheraton Boston & Hynes Convention Center, Boston, MA. Website: www.annanurse.org
- * April 9, 2011. Exam date for CNeph(C) certification exam. Contact Canadian Nurses Association Certification Program, e-mail: lvachon@cna-aiic.ca
 Website: www.cna-aiic.ca Toll-free phone number: 1-800-450-5206

DID YOU KNOW...?



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

- 1) Call TOLL-FREE from anywhere in Canada/US: 1-877-720-2819 or local dial 705-720-2819
- 2) E-mail: cannt@cannt.ca
- 3) Fax: 705-720-1451
- 4) Mail: 336 Yonge Street, Suite 322, Barrie, ON L4N 4C8



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CANNT 2010

Metro Toronto Convention Centre, Toronto, Ontario

November 18-20, 2010

OUR MOSAIC OF RENAL CARE

This conference, CANNT 2010, promises to be a stimulating forum where nephrology professionals... nurses, technologists, administrators, researchers and pharmacists... will be able to learn, share, network, discuss and socialize together.

Experience all that CANNT 2010 has to offer...

- Share in the messages of top-rated professional speakers...
- Choose from 63 concurrent sessions suited to all interests... topics range from nutrition, transplantation, end-of-life issues, pediatrics, infection control and much, much more...
- Peruse 30 poster presentations with contributing authors from one coast of Canada to the other—you'll be delighted in the diversity of nephrology topics being profiled this year!
- Interact with our corporate partners as they display their latest products and services, and share their expertise with delegates. With ample opportunities to network with corporate representatives, delegates should come prepared with questions and issues.
- Immerse yourself in this year's conference theme. Our social activities and the scientific program will inspire, educate, rejuvenate and motivate you for the everyday challenges of your professional and personal lives.

Register today! CANNT 2010 information is available as follows:

- 1) printed brochure available by calling: (519) 652-0364 (Innovative Conferences & Communications)
- 2) downloadable brochure on-line at www.cannt.ca
- 3) program, abstracts, on-line registration and secure payment on-line at www.cannt.ca

We're excited to welcome Canadian nephrology professionals to Toronto — to experience CANNT 2010.

Abstracts

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

CANNT's national conference, CANNT 2010, provides an excellent venue for accomplishing these goals of CANNT. However, only a portion of CANNT members are able to attend the national conference annually. Cognizant of this, CANNT is pleased to be printing 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 705-720-2819 or 1-877-720-2819 or cannt@cannt.ca to receive information regarding how to contact the author about the work. We hope you will carefully review these abstracts!

Gillian Brunier Editor, CANNT Journal



Conférence nationale annuelle de l'ACITN de 2010

Metro Toronto Convention Centre, Toronto, Ontario

18 au 20 novembre, 2010

NOTRE MOSAÏQUE DES SOINS RÉNAUX

La Conférence nationale annuelle de l'ACITN de 2010 promet d'être un forum stimulant où les professionnels de la néphrologie—infirmières, technologues, gestionnaires, chercheurs et pharmaciens—se donnent rendez-vous pour approfondir leurs connaissances, échanger leurs idées et opinions, réseauter, discuter et nouer des relations.

Venez vivre l'expérience de la Conférence nationale annuelle de l'ACITN de 2010...

- Venez écouter nos conférenciers-invités, tous experts dans leur domaine.
- Choisissez parmi 63 ateliers simultanés ceux qui répondent le plus à vos champs d'intérêt. Les sujets abordés vont de la nutrition, à la maîtrise de l'infection, en passant par la transplantation, les questions liées à la fin de la vie et les enjeux d'ordre pédiatrique. Et, beaucoup plus encore!
- Consultez 30 d'affiches scientifiques auxquelles ont participé des auteurs d'un bout à l'autre du Canada—vous serez enchantés par la diversité des thèmes qui sont présentés cette année sur la néphrologie!
- Venez rencontrer nos partenaires commerciaux. Ils vous feront part de leurs plus récents produits et services et partageront avec vous leur expertise. Comme nous vous offrons maintes occasions de réseauter avec les représentants de l'industrie, nous vous conseillons de préparer les questions ou sujets de discussion que vous aimeriez aborder avec eux.
- Laissez-vous vous imprégner du thème de la Conférence de cette année. Les activités sociales prévues et le programme visent notamment à vous inspirer, à parfaire vos connaissances, à vous régénérer et à vous motiver afin de relever les défis quotidiens qui jalonnent votre vie professionnelle, mais aussi votre vie personnelle.

Inscrivez-vous maintenant! Pour de plus amples renseignements sur la Conférence nationale annuelle de l'ACITN de 2010, veuillez consulter les sources d'information suivantes :

- 1) brochure imprimée en appelant au 519-652-0364 (Innovative Conferences & Communications)
- 2) brochure en ligne à www.cannt.ca
- 3) programme et actes de la conférence, inscription et paiement sécurisé en ligne à www.cannt.ca

C'est donc un rendez-vous à Toronto pour tous les professionnels canadiens de la néphrologie—venez vivre l'expérience de la Conférence nationale annuelle de l'ACITN de 2010.

Résumés

Conformément à certains de ses objectifs stratégiques clés, l'Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN/CANNT) doit diffuser des outils éducationnels à ses membres, médiatiser la recherche scientifique et offrir des occasions de réseautage aux collègues de la néphrologie.

Le Congrès annuel de l'ACITN/CANNT de 2010 offre un excellent cadre pour l'atteinte de ces objectifs. Toutefois, nous sommes conscients qu'une seule portion des membres de l'ACITN/CANNT peut y assister. Pour remédier à cela, nous avons le plaisir de vous annoncer que nous publierons les textes complets des communications et des affiches scientifiques du Congrès de 2010.

Les résumés suivants célèbrent la diversité des sujets en néphrologie qui font l'objet d'études et de discussions au Canada. Les membres de l'ACITN/CANNT qui désirent approfondir un sujet en particulier, abordé pendant le Congrès, peuvent communiquer avec le bureau de l'ACITN/CANNT, par téléphone au 705-720-2819 ou au 1-877-720-2819 ou par courriel à cannt@cannt.ca, afin d'obtenir la marche à suivre pour joindre le ou les auteurs.

Je vous souhaite une bonne lecture attentive de ces résumés!

Gillian Brunier

Rédactrice en chef, Journal de l'ACITN/CANNT



Vascular access: It's not in VAIN

Patty Quinan, RN, MN, CNS, CNeph(C), Humber River Regional Hospital, Toronto, ON, and Rosa Marticorena, RN, BScN, CNeph(C), DCE, St. Michael's Hospital, Toronto, ON

It is universally accepted among nephrology nurses and practitioners that the native arteriovenous (AV) fistula is the best vascular access for chronic hemodialysis patients. AV fistulas are associated with decreased mortality and morbidity, fewer hospitalizations and interventions, and improved long-term survival, when compared to AV grafts and central venous catheters (CVC).

Nurses play a vital role in improving patients' outcomes. Good clinical assessment of vascular access, close monitoring of treatment parameters related to access, and prompt reporting of access problems are all factors necessary for achieving and maintaining a functional vascular access.

The purpose of this session is to provide nephrology nurses (from novice to expert) with a theoretical and practical review of vascular access. This session includes information on venous and arterial mapping, AV access creation, assessment and troubleshooting strategies for successful cannulation of new and developed AV accesses, accessing CVC and strategies to improve catheter patency, prevention and standardized reporting of catheter-related blood stream infections (CR-BSI), monitoring machine and access parameters, and common surgical and radiological interventions. Case studies with radiological images will be presented of tunnelled CVC insertion, catheter-related central occlusion, stenosis treated with angioplasty, vascular access thrombosis, stent placement, and coiling of collateral/accessory veins. Opportunities for discussion will be encouraged.

The implications for nursing practice are to increase nurses' knowledge and understanding about vascular access, in order to optimize patient outcomes, reduce vascular access-related complications, and help prolong vascular access survival.

Implementing a patient empowerment philosophy

Linda Kloosterman, RN, BScN, CNeph(C), Baxter Canada, and Emily Harrison, BHSc, CNeph(C), Lakeridge Health Corporation, Toronto, ON

Patients living with chronic kidney disease (CKD) have multiple co-morbid conditions that require frequent intervention and support from the health care system. In fact, 66% of our CKD patients have more than five chronic conditions, yet these complex nephrology patients self-manage their care 94% to 99% of the time. The impact of behaviour change in this group could have significant impact on their clinical health outcomes.

Lakeridge Health Corporation, in partnership with Baxter Canada, is transforming how renal health care can be designed and delivered through the Renal Chronic Disease Prevention and Management (CDPM) initiative. Using the expanded chronic care model, a key area of focus is self-management/self-management support. Our model is aligned with the Ontario Provincial CDPM philosophy of care. Through partnership with the Central East Local Health Integrated Network self-management project, self-management support workshops for staff, follow-up coaching, creation of new educational materials, peer support group activities and development of self-management champions, a patient empowerment philosophy was achieved. The result is a self-management approach that encompasses many layers within the health care organization and community; starting with the patients with chronic kidney disease, the multidisciplinary staff at the local hospitals, health care industry leaders and the government.

The culture of vascular access cannulation among nurses in a chronic hemodialysis unit

Barbara Wilson, RN, MScN, CNeph(C), London Health Sciences Centre, London, ON, Lori Harwood, RN(EC), MSc, CNeph(C), London Health Sciences Centre, London, ON, and Abe Oudshoorn, RN, PhD(c), University of Western Ontario, London, ON

The native arteriovenous fistula (AVF) is the vascular access of choice for HD because of its longevity and lower complication rate, yet, despite this, AVF use is less than optimal. There are a number of contributing factors to low AVF use. While some of these factors may be patient-related, nursing interventions specific to cannulation may be a contributor. To date, little is known about nurses' attitudes and experiences around cannulation. The purpose of this study was to describe the culture and everyday practices of vascular access cannulation of the AVF from the perspective of the hemodialysis nurse. An ethnographic research design was employed, utilizing qualitative methods. Ten hemodialysis nurses were interviewed using a semi-structured interview tool. A number of themes were generated from the interviews. One overarching theme of "perpetual novice" was evident. Other common themes that emerged from the interviews were: a) limited fistula numbers, b) the fistula as a "hard sell" to patients, c) the skill of cannulation, and d) the assembly line. As a result of a number of factors, nurses were unable to acquire the skills necessary to become an expert cannulator and fewer opportunities to practise cannulation have resulted in wide variation in skill level

between nurses. Nurses identified a number of educational strategies and the need for improved documentation systems as means to increasing successful cannulation. Results of this study will be helpful in directing future educational, supportive, and practice interventions for hemodialysis nurses.

This study was funded by the Canadian Association of Nephrology Nurses and Technologists (CANNT) 2008 Research Grant.

Ethics e-learning: Helping nurses meet the ethical challenges they face in everyday practice

Laurie Sourani, BA, LLB, Canadian Nurses Association, Ottawa, ON, and Margot McNamee, RN, BA, MHA, Canadian Nurses Association, Ottawa, ON

The Canadian Nurses Association (CNA) Code of Ethics for Registered Nurses (2008) is a statement of the ethical values of nurses, defining nurses' commitments to persons with health care needs. Nephrology nurses can be faced with ethical challenges related to initiation of treatment, discontinuation of treatment, transplantation or allocation of scarce resources. Ethical challenges can also occur in their relationships with others, in enacting their responsibilities, and in their decision-making within a health care environment that is complex and ever-changing. To help nurses recognize and address these challenges and maintain their ethical commitments, CNA is unveiling a series of Online Ethics Learning Modules to be used by nurses, students, educators and others.

This session will showcase how these interactive modules can be used to engage nurses in the code, helping them to use the code's values in practice. Examples of learning objectives, thought-provoking case scenarios, and practice quizzes will be presented. This session will also provide an overview of methods used to create the online tools.

Resources that help nurses understand their ethical responsibilities, provide them with guidance, and support ethical reflection are essential in daily practice. Educators can also utilize these dynamic teaching tools, encouraging students to gain an appreciation of the code early on in their learning. The Code of Ethics Online Learning Modules are being developed as a tool to support ethical nursing practice and this session is designed to demonstrate their value in everyday nephrology nursing practice.

Clinical dilemma—The use of fondaparinux during nocturnal home hemodialysis in a pregnant woman

Elizabeth Wong, RN, BScN, CNeph(C), Toronto General Hospital, University Health Network, Toronto, ON, Celine D'Gama, RN, BHScN, CNeph(C), Toronto General Hospital, University Health Network, Toronto, ON, Rose Faratro, RN, BHScN, CNeph(C), Toronto General Hospital, University Health Network, Toronto, ON, and Stella Fung, RN, BHScN, CNeph(C), Toronto General Hospital, University Health Network, Toronto, ON

Thrombocytopenia in hemodialysis is rare, but may be associated with exposure to heparin, known as heparininduced thrombocytopenia (HIT). We describe a unique case of a 34-year-old pregnant woman who developed thrombocytopenia using standard systemic heparinization while undergo-

ing nocturnal home hemodialysis (NHHD). Given our suspicion of HIT, we chose other alternate strategies such as saline flushes and regional citrate anticoagulation. Despite multiple attempts, clotting of the dialysis circuit persisted until we administered fondaparinux 2.5 mg subcutaneously daily post hemodialysis. Pre- and post-hemodialysis drug concentrations were measured. Pre-hemodialysis levels remained relatively constant between 0.6 mcg/mL and 0.8 mcg/mL while posthemodialysis levels were between 0.47 mcg/mL and 0.72 mcg/mL. Approximately 25% of fondaparinux was removed by hemodialysis, serum drug concentrations of fondaparinux remained within therapeutic target and there was no demonstrable toxic accumulation of drug. The circuit remained clot free and there was no evidence of bleeding in the patient. To our knowledge, our case is the first to demonstrate the use of fondaparinux as a safe and efficacious anticoagulant in a pregnant patient undergoing intensive frequent hemodialysis.

Simple solutions: Home hemodialysis equipment—Cost-effective cart and lift system allowing one person transport of equipment

Kenneth Fast, MBA, BSc, Grand River Hospital, Kitchener, ON

The purpose of this oral presentation is to describe an innovative solution developed by the renal technologists at Grand River Hospital. The home hemodialysis program is a quickly growing service that has experienced many new and unique challenges. One of those challenges is trying to provide the appropriate manpower when there are a limited number of technologists available. In the event of an equipment failure, two individuals are often required to replace and/or exchange the equipment from the patient's residence. While attention to safety and proper ergonomics is a priority, a reasonable solution was needed to meet the clinical needs of the patients.

The technical group has resolved this issue by designing a customized cart for the portable reverse osmosis unit and water pre-treatment, which incorporates a clamp-on davit to lift equipment on and off the cart. The cart is designed specifically





for a hemodialysis water system. It is durable, user friendly and allows the technologist full access to work on the equipment without removal. The added davit-type crane allows a single person to completely transfer a reverse osmosis system while staying within ergonomic guidelines, as set out by the National Institute for Occupational Safety and Health (NIOSH).

The presentation will also demonstrate the cart is cost effective and exceeds the functionality of what is currently available in the market. The presentation also hopes to provide a framework for other renal programs to explore their own creative solutions in the best interests of their patients and staff.

Whose job is it anyway? The allocation of responsibilities between nurses and renal technologists in a home hemodialysis program

Nancy Evans, RN, BScN, CNeph(C), Grand River Hospital, Kitchener, ON, Clarence Graansma, Renal Technologist, Grand River Hospital, Kitchener, ON, and Elizabeth Dabrowski RN, Grand River Hospital, Kitchener, ON

This presentation will outline the process and challenges experienced by a new and evolving home hemodialysis (HHD) program at Grand River Hospital. Recognizing many new programs often begin with only preliminary resources, the success of growth required the team to work effectively and efficiently. This included the need to define the roles and responsibilities of the nurses and renal technologists within the program, with clear definitions and expectations for all team members, while recognizing all the various aspects provided within HHD services. This presentation will look at how the HHD team communicated and cooperated to achieve the desired outcomes. This will include the management of patient recruitment, initial home visits, patient training and clinical and technical support. Initial successes will be highlighted in the presentation, as well as the lessons learned as the program continued to evolve and expand. These experiences created many rewards, and frustrations for the team members working in HHD. Finally, the presentation will highlight how these learning experiences contributed to the success of the HHD program and, ultimately, met the care needs of our patients.

Shower and no-dressing technique for tunnelled central venous catheters: An update one year later

Julie Ann Lawrence-Murphy, RN(EC), NP, MScN, CNeph(C), London Health Sciences Centre, London, ON, Sue Seiler, RN, London Health Sciences Centre, London, ON, Alexandra Hooton, RN, London Health Sciences Centre, London, ON, Andrea Pember, RN, London Health Sciences Centre, London, ON, and Christine St. Roch, RN, London Health Sciences Centre, London, ON

In late 2008, a pilot project was implemented entitled "Shower and No-Dressing Technique". Our Vascular Access Best Practice Group at London Health Sciences Centre (LHSC) learned of this innovative technique where hemodialysis patients were taught to shower with tunnelled central-venous catheters. A literature review showed abundant information comparing infection rates between different dressings, but a paucity of information detailing the effects of 'no dressing' for tunnelled central lines. In addition, registered nurses often report patients arriving with wet and non-intact dressings due to showering. As a result of nurses' observation, available data on central line care, and reports of showering improving quality of life, the "Shower and No-Dressing Technique" has been introduced to three campuses at LHSC. Convenience sampling began in August 2008. Current data include 18 patients who are, or have been involved in the project with NO FURTHER episodes of adverse events above the one event reported at last update (CANNT 2009). Inclusion criteria include: catheter in situ for at least six months, no history of catheter-related bacteremia, ability to perform the proposed technique, and low contamination risk in the patient's work or home setting. Patients who had medications instilled in the catheter limbs (other than Citrate) were excluded, as well as those with nasal or rectal cultures indicative of resistant organisms. After 101.5 patient-months, there has been one catheterrelated infection. There have been no exit-site concerns. Water testing from participant homes was performed to identify possible vectors of pathogen transmission. These results have compelled our leadership teams to facilitate the implementation of a larger continuous quality improvement endeavour. This initiative will compare the "Shower and No-Dressing Technique" to the current standard of care. Data collection will be expanded to include infection rates, exit-site characteristics, quality of life, and cost comparisons.

System navigation: Improving health care transitions for patients and staff

Linda Kloosterman, RN, BScN, CNeph(C), Baxter Canada, and Emily Harrison, BHSc, CNeph(C), Lakeridge Health Corporation, Oshawa, ON

Navigating the health care system can be complex and inconsistent for all—patients and providers alike. People living with chronic kidney disease have multiple co-morbid conditions requiring frequent utilization and support from the health care system. The ability to improve patient flow during transition points of care is critical to ensure safe and timely transfer of accountability, clear and effective communication between health care providers, and comprehensive support for patients and caregivers.

Lakeridge Health Regional Nephrology System, in partnership with Baxter Canada, is taking a proactive and disciplined approach to implementing a Renal Chronic Disease Prevention and Management (CDPM) program. Using the expanded chronic care model, a key area of focus of the initiative is on delivery system design examining transition points of care. Through a series of patient process flow mapping exercises and transitional workshops with staff, gaps in health care service delivery were identified. Using the Plan Do Study Act (PDSA) model for rapid cycle quality improvement, action plans were created by the team to address gaps, with the goals to improve care coordination and communication, patient and provider satisfaction with care, workflow efficiencies and utilization of hospital resources.

Benchmarking for best practice and advanced competence in peritoneal dialysis

Patsy Cho, RN, MScN, Sunnybrook Health Sciences Centre, Toronto, ON, Emelie Exconde, RN, Sunnybrook Health Sciences Centre, Toronto, ON, Shirley Drayton, RN, BA, Cert Mediator, Sunnybrook Health Sciences Centre, Toronto, ON, Gillian Brunier, RN, MScN, CNeph(C), Sunnybrook Health Sciences Centre, Toronto, ON, and Virginia Sulit, RN, Sunnybrook Health Sciences Centre, Toronto, ON

This best practice educational initiative was undertaken to support advanced competence in peritoneal dialysis (PD) by addressing the need for standardized practice, increased knowledge through new staff training, and practice review of senior staff. Funding for the 230-hour program was provided by the Ontario Ministry of Health Late Career Nurse Initiative (LCNI)—a program designed to utilize the experience and skill of RNs aged 55 and up not yet ready for retirement, to mentor staff and be a resource. The program was delivered by the advanced practice nurse of the unit in collaboration with an experienced PD ward nurse to 40 (100%) staff nurses (seven new PD trainees and 33 practising PD nurses) working in an integrated inpatient medicine/nephrology unit. Members of the interprofessional peritoneal dialysis team from nursing, social work, nutrition, pharmacy, physiotherapy and occupational therapy were engaged in the educational process. The teaching program consisted of traditional didactic teaching and evaluation methods. Key program components were a theory workshop, a resource manual, a review of existing evidence underlying clinical standards, delivery of a written competence exam with return demonstrations, and use of tools developed specifically for the program that included PD flash cards and training videos. One hundred per cent of staff participated, surpassing the program target mandate of 75%. It is hoped that this PD initiative would lay the groundwork on the unit for future Canadian Nurses Association certification and establish a PD knowledge benchmark to support advanced competence in peritoneal dialysis.

CSI (clinical scenario investigation): Hyperkalemia

Ann Jones, RN(EC), MSN, CNeph(C), St. Michael's Hospital, Toronto, ON, Alison Thomas, RN(EC), MN, CNeph(C), St. Michael's Hospital, Toronto, ON, and Joyce Hunter, RN, St. Michael's Hospital, Toronto, ON

Hyperkalemia is a potentially life-threatening complication among hemodialysis (HD) patients. While dietary intake is the most common cause of excursions in serum potassium among HD patients, other contributing causes must be suspected.

Purpose: The purpose of our presentation will be to: review a case study of a HD patient with hyperkalemia and an AVF prone to stenosis; review dynamic venous pressure (DVP) monitoring; and heighten awareness of HD nurses regarding the clinical importance of DVP in AVF surveillance.

Description: DVP monitoring is an important surveillance method used by HD nurses to measure venous and arterial pressures on HD machines at a blood pump speed (Q_b) of 200 mL/min within the first five minutes of treatment. Divergence from expected venous or arterial pressures should alert the nurse to consider the cause for the change. Recirculation within the access should be a primary suspicion, prompting a CSI—including further patient, laboratory, and vascular access assessment. Our case study will illustrate the importance of DVP monitoring and overall vascular access evaluation.

Evaluation/outcome: Review of the patient's HD log sheets showed changes over time in DVPs with arterial pressures near zero at Q_b 200 mL/min. Further investigation uncovered AVF stenosis with interventional follow-up required.

Implications for nephrology practice/education: Elevations in the serum potassium in a stable chronic HD patient should be a red flag for HD nurses to investigate for vascular access malfunction. HD nurses are in a position to critically analyze and act on suspicious trends in venous and arterial pressures in order to avert the potentially lethal impact of hyperkalemia.

Creating a home first philosophy

Linda Kloosterman, RN, BScN, CNeph(C), Baxter Canada, and Colleen Cuddy, RN, MHS, Ottawa Hospital, Ottawa, ON

As the number of Canadians diagnosed with CKD continues to rise, the pressure to keep health care costs under control while maintaining high quality of care also rises.

The Ottawa Hospital, in partnership with Baxter Canada, is transforming the nephrology health care system using Chronic Kidney Disease Prevention and Management (CKDPM) approach to patient care. Our project, a major change initiative,





is designed to improve and enhance quality patient care delivered to nephrology patients while increasing efficiencies in workflow, reducing costs, improving outcomes and increasing patient and provider satisfaction. One aspect of this project is to increase home modalities where medically appropriate. This is strategically aligned with the Ontario Peritoneal Dialysis Initiative, the Ministry of Health and the newly formed Ontario Renal Network in emphasizing a "home first" philosophy.

Strategies implemented to assist with a home first philosophy:

- Strategic growth plan development/review
- Predialysis education restructuring
- Peer-to-peer patient education
- Acute start education program
- Radiologic placement of PD catheters
- Coordination with LHIN, CCAC and LTC facility
- Case management model in home dialysis unit
- Home Therapy Champion dinner/debate
- First annual Nephrology Home Therapies symposium

A radiating experience: Hemodialysis with radioactive iodine treatment

Lisa Sullivan, BTech, Eastern Health, St. John's, NL, Linda Ivany, RN, BN, Waterford Hospital, St. John's, NL, and Rick Scanlan, RTNM, Eastern Health, St. John's, NL

A recent dialysis patient in Newfoundland had to receive radioactive iodine (131 I) treatment for thyroid cancer. This was a new procedure for Newfoundland and Labrador and, in particular, Eastern Health. This presentation will give you a comprehensive overview on how Eastern Health accomplished this treatment safely and effectively. There were three areas of expertise that were essential in setting up and carrying through the project from start to finish: dialysis technologist, hemodialysis clinical staff and nuclear medicine.

These representatives met and determined how and where these procedures would take place. It was imperative that nuclear medicine in-serviced all the staff and discussed both the pre and post factors related to dealing with ¹³¹I, especially in limiting the amount of exposure to each individual involved.

The dialysis technologists had two main concerns. One was the location of the treatment room, specifically its access to RO water, and the location for the drain from the dialysis machine. The highest amount of radioactive exposure is through the drain tubing. Also, technologists had to determine, with nuclear medicine's assistance, when the machine would be free from any future radioactive exposure to patients or staff after each treatment.

Finally, the discussion will include clinical obstacles that were faced when dialyzing a patient beyond the scope of modern-day isolation. Analysis of nursing procedures adapted to a patient with such unique needs was thoroughly scrutinized. Nursing care for this patient took on its own identity and set the footprint for future distinctive dialysis treatments at Eastern Health.

Global exchange of knowledge

Judith Ferguson, RN, CNeph(C), York Central Hospital, Toronto, ON

Travel is an education in itself. The Amgen International Travel Grant provided cultural growth, knowledge exchange, renewed passion for growth of home therapies and motivation to put new ideas into practice in the peritoneal dialysis unit.

It was an AMAZING opportunity to visit Brisbane, Australia, and explore new ideas and emerging trends related to PD practice. In this session, I would like to communicate my experiences, which provided much sharing of information through an onsite visit to a PD unit. The presentation will include comparisons between the PD programs and strategies used to increase their PD population. I'll explore other ideas such as teaching tools, empowerment of self-management, new evidence-based research for exit site care, cognitive assessment prior to modality choice and what is a Renal Rover?

I also attended "The 3rd Annual Australian and New Zealand Home Therapies Conference" and will discuss how the renal health professionals view home dialysis. While at the conference, I presented a poster, "Collaboration and Partnership to Promote Peritoneal Dialysis Growth", which I will expand upon.

Travelling to Australia was a great motivator and gave me a new perspective in home therapies. Many of the new ideas generated will be reviewed and put into practice in our PD unit to promote patient-focused care. Home therapies represent a challenge all over the world and this is truly a global issue.

Whatever happened to...? A five-year retrospective review of "Acute Start" dialysis patients who were provided with education and support for modality choice

Diane Watson, RN(EC), MSc, CNeph(C), University Health Network, Toronto General Hospital, Toronto, ON, and Christopher Chan, MD, FRCP(C), University Health Network, Toronto General Hospital, Toronto, ON

Individuals who start dialysis acutely in hospital provide therapeutic and system challenges for nephrology programs, with the vast majority historically remaining on in-centre hemodialysis. The University Health Network (UHN) in Toronto initiated a nurse practitioner (NP) consultation service in 2005, whereby each patient starting dialysis acutely is seen by the consulting NP to provide education, support, and encouragement to consider home dialysis modalities—peritoneal dialysis (PD) or nocturnal hemodialysis (NHD). This paper will provide a five-year retrospective review of acute start

dialysis patients at UHN. It will highlight choice of modality, as well as describe the patient population including etiology of renal failure and co-morbidities, and will provide data regarding patient survival. We found a significant trend for those who started dialysis in the ICU to remain on in-centre hemodialysis rather than a home modality (21% versus 9%). Those with an etiology of glomerulonephritis or failed renal transplant tended to choose home dialysis (14% and 24% respectively), and those with cardiovascular disease tended to choose PD (29% versus 9% in-centre and 5% NHD). The results of this review provide evidence that intervention with individuals who start dialysis acutely is successful in encouraging home dialysis. The results have also unmasked some therapeutic challenges, such as the need for more extensive "predialysis" care for those with renal transplant, and the need for close renal care of those with other organ transplant.

Aligning the stars: Nursing shortage, changes in nursing college standards and moving nursing practice towards a collaborative care model

Mary Milton, RN, CNeph(C), Grand River Hospital, Kitchener, ON, Pam Cerquiera, RN, CNeph(C), Grand River Hospital, Kitchener, ON, and Kim Hendrick, RN, CNeph(C), Grand River Hospital, Kitchener, ON

For decades, the growth of acute hemodialysis centres has required patient care to be managed with models that included disciplines other than nursing. As non-nursing tasks increased, new job classes such as dialysis/renal assistants were implemented. The staffing mix also changed when renal technologists were trained to cannulate patients. All these strategies were introduced to create a balance in the appropriate skill mix and clinical demands on staff.

While many renal programs have registered nurses (RNs) as their predominate model of care, a growing number of organizations are introducing registered practical nurses (RPNs) into their renal services. With the recent revision of RPN college standards and the reality of the nursing shortage, renal administrators are actively implementing the collaborative practice of nursing between RN/RPNs. Grand River Hospital implemented this practice in April 2010 in the main 30-bed in-centre hemodialysis unit.

Concurrently, the renal program forged into uncharted territory by also introducing RPNs into the renal clinic. Our presentation will speak to the culture change, the integration of acquired knowledge from the experiences of the RPNs in both clinical areas during their introduction. The presentation will also review the lessons learned and opportunities for future growth, along with the evaluations that will reflect the success of our objectives.

Matching cannulators and accesses: Outcomes of a pilot project

Rick Luscombe, RN, BSN, CNeph(C), St. Paul's Hospital, Vancouver, BC, and Laurie Bates, RN, CNeph(C), Penticton Regional Hospital, Penticton, BC

It has been recognized in the hemodialysis (HD) community (1) that fistulas and grafts vary in the ease with which they can be cannulated; and (2) that there is a range of cannulation skills among HD nurses. Despite recommendations in the lit-

erature and in many national guidelines to match the degree of difficulty of an access to cannulate with the skill level of the cannulator, few (if any) programs exist to ensure this match.

In British Columbia in 2006, the Provincial Vascular Access Services Team (PVAST) developed a provincial guideline for cannulation of arteriovenous (AV) fistulas and grafts. The guideline recommended that the degree of difficulty of an access to cannulate be matched with the skill level of the cannulator. Formalized processes were developed to categorize the degree of difficulty of an access to cannulate (easy, moderately complicated or complicated) and the skill level of an individual cannulator (novice, skilled and advanced). The processes were tested at three "pilot" hemodialysis units in 2008/09 and 2009/10. The outcome, while different than expected, did result in an increased focus on vascular access and an improvement in overall care of hemodialysis patients.

This session provides examples of some of the innovative activities that were implemented as a result of this "pilot" project, and summarizes the outcome of attempts to match accesses and cannulators.

Bridging the gap—Quality nephrology services to remote community centres through telemedicine: Real-time videoconferencing

Manon Campbell, RN, CNeph(C), Ottawa Hospital, Ottawa, ON, Ayub Akbari, MD, Ottawa Hospital, Ottawa, ON, Stephanie Amos, PhD, Ottawa Hospital, Ottawa, ON, and Cameron Keyes, MSc, Ottawa Hospital, Ottawa, ON

Access to nephrologists in remote areas remains a challenge. Added cost and stress of travelling for follow-up visits can compromise patients' well being. A Nephrology Telemedicine Clinic pilot project was initiated at The Ottawa Hospital (TOH) in June 2008 to evaluate whether telemedicine follow-up visits are a viable option for patients with chronic kidney disease (CKD) before stage 5.

Surveys were developed to rate anonymous patient and provider responses to statements using a five-point Likert scale.





Open-ended questions were included to garner specific details of their experience. We evaluated the needs and expectations of patients, physicians and nurses, and analyzed staff-worked hours per visit from TOH's monthly financial and statistical reports and from the Clinic Summary Tool (CST) section of the surveys.

Data revealed that patient, nurse and nephrologist experience with care delivery via telemedicine was overwhelmingly positive. Patients expressed that they received effective support and wanted telemedicine to continue. Some patients indicated they would discontinue follow-up care if they had to commute to the city. The analysis of utilization data showed no significant increase in staff-worked hours.

Our results show that telemedicine is a viable option for CKD patient care. Physicians, nurses and patients unanimously support this pilot clinic. Telemedicine should be strongly considered for the care of remote CKD patients. Further research is needed to determine the clinical implications and outcomes for telemedicine CKD patients.

Calciphylaxis: A case review of extreme deposits

Charlotte McCallum, RN(EC)—Adult MN/ACNP, London Health Sciences Centre, London, ON, Sandy Perry-Tatone, RN, London Health Sciences Centre, London, ON, Rita Piccoli, RN, London Health Sciences Centre, London, ON, and Kathy McConville, RN, London Health Sciences Centre, London, ON

Calciphylaxis is a deposit of calcium into non-bone areas. Extra-osseous calcification can occur in blood vessels and in soft tissues. This 'rare' disorder most commonly occurs in patients with end stage renal disease. Soft tissue deposits can form large, hard masses. Scientifically, the 'medium' of this process is not fully understood. These deposits result in a very high mortality, can cause severe pain, and take months to resolve if the treatment is 'well done'.

This presentation is a case review of a patient with calciphylaxis, how it affected the patient's health, and how the problem was resolved. Utilizing current research, basic science is interspersed within this case presentation to explain the physiology of this rare complication, and treatment recommendations. The purpose of this presentation is to review the theory and physiology of this disorder in an interesting format, thereby increasing nursing knowledge. Objectives/outcomes for participants include being able to identify abnormal laboratory values, increase assessment skills, understand the rationale for treatment recommendations, and develop a nursing care plan utilizing a holistic approach.

Green dialysis for a greener tomorrow: Environmentally conscious hemodialysis therapy

Rejean Quesnelle, Renal Technologist, Halton Healthcare Services, Oakville, ON

An unavoidable fact in health care is the generation of medical waste. With a current trend towards the use of single-use devices and the growing number of elderly patients, the volume of waste generated by medical facilities has increased tremendously over the years. Hemodialysis therapy plays a significant role in the waste pyramid, with nearly all clinics and hospitals throughout Canada utilizing a single-use model over a reuse model common to many facilities in the United States.

The purpose of this project is to introduce a new approach to delivering hemodialysis therapy in Canada, and the establishment of new habits to reduce, reuse, recycle and rethink current practices, while redesigning them to incorporate a new sustainable model for a stronger and healthier system. This will have significant positive implications towards delivering better and a more efficient level of health care, all the while maintaining a focus on the hemodialysis area in particular.

Some questions that will be answered by the project are: How can your facility be more environmentally friendly? How can your facility reduce its annual waste volume and carbon footprint? How can you reduce your facility's operating expenses by way of changing current practices and policy? What new technology can be introduced to conserve water, reduce electrical demand, reduce waste, and minimize workplace toxic exposure?

Green dialysis hopes to prove that eco-minded and sustainable practices can not only be simple to implement, but also a trend that will soon become the norm.

Arterial stiffness in hemodialysis patients

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Purpose: Arterial stiffness (AI) is an independent predictor of mortality in ESRD patients and is increased in this population. This study examined AI in ESRD patients prior to, during and post hemodialysis (HD) and was also compared to that in healthy individuals.

Methods: Peripheral blood pressure was measured manually and central pressures (CP), augmentation index (AI) and subendocardium viability ratio (SEVR) were determined using applanation tonometry (SphygmoCor® CP). Measures were obtained at pre-, 10-min, 1-hr, 2-hr, 3-hr and 4-hr and 10-min post-HD in ESRD patients (n=23) on three consecutive days and in healthy controls (n=30) in three different days.

Results: AI (corrected to pulse pressure) did not change at 10-

min of HD, but was reduced at one through 4-hr of HD (p<0.05). At 10-min post-HD, AI increased above the 4-hr of HD value (p<0.05), but was not different from pre-HD. SEVR was greater than pre-HD at 1 to 4-hrs of HD (p<0.05). SEVR decreased at 10-min post-HD, but was still greater than at pre-HD (p<0.05). AI (corrected to pulse pressure/heart rate) and CP (systolic, diastolic) were greater in ESRD patients pre-HD, as compared to controls (p<0.05). SEVR was not different between ESRD and controls.

Conclusions: AI and SEVR improved during HD. This effect remained for SEVR post-HD. These improvements were not associated with volume loss since the effect occurred early in HD. AI and pressures were greater in ESRD versus controls pre-HD, but not post-HD.

Implications for nephrology care: During HD, decreased arterial stiffness and enhanced coronary flow contribute to lower cardiovascular stress.

Taking control of renal disease: A web-based patient portal for renal patients at Grand River Hospital

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The primary goal of this project is to utilize technology to increase patients' direct involvement in their health care with the goal of improving their outcomes. With the collaboration of the health care provider and the online tools available in the chronic kidney disease (CKD) patient portal, patients are able to set personal health goals and track their progress online. In response to a growing public demand for more health information, the CKD patient portal can be used by patients to find out more about their health, view their personal health information, which may include laboratory results, scheduled appointments and medication prescription renewal.

Grand River Hospital assembled a working group that included all of the health professionals who participate in the development and implementation of the patients' plan of care. Patients were also represented by members of the renal community council, who were active in all phases of the process. Community stakeholders were also involved in the development of content and linkages.

Preliminary results and lessons learned from the project will be presented. The conceptual development of "patient facing applications" remains in its infancy. The team plans to continually evolve the theoretical frameworks and build in the expected usability testing so that patients can have an impact on their communication with team members and, ultimately, their health outcomes.

Putting your best foot forward

Cheryl Cullimore, RN, BScN, CNeph(C), Brant Community Healthcare System, Brantford, ON

Foot complications account for approximately 20% of diabetes-related hospital admissions in North America (Canadian Diabetes Association [CDA] Clinical Practice Guidelines, 2008). The risk of a lower-limb amputation in people with diabetes and uremia is 10 times higher than for those people

with diabetes alone (Schomig, Ritz, Standl, & Allenberg, 2000). Together, the Niagara Health System, St. Joseph's Healthcare Hamilton, Brant Community Healthcare System and the Community Care Access Centre have set out to reduce the number of lower-limb complications in this population by providing foot care clinics within the dialysis centres.

The Best Foot Forward Program is an Ontario Local Health Integration Network (LHIN)-funded program. Community foot care nurses and chiropodists provide diabetic foot care to the patients on dialysis at no cost. Dialysis nurses make referrals for the patients to the clinic based on a comprehensive foot assessment created by the Registered Nurses Association of Ontario—Best Practice Guideline: Reducing foot complications in people with diabetes. Over the next few years, amputation rates, emergency department visits for lower-limb complications, and hospital admissions due to lower-limb complications will all be measured to evaluate the program's effectiveness on patient outcomes. During this presentation, you will have the opportunity to work through our comprehensive foot assessment form, see our basic foot and nail care handout for patients and families, and learn about our interdisciplinary foot care program.

"We are what we eat!" The impact of phosphate additives in chronic kidney disease

June Martin, RD, Grand River Hospital, Kitchener, ON

The purpose of this oral presentation is to raise awareness and build the knowledge of health care practitioners regarding the harmful impact of food additives to the overall well being of renal patients. In particular, phosphate additives that are commonly found in foods can cause patients to experience high levels of serum phosphorus, resulting in increased risks of cardiovascular mortality in chronic kidney disease patients. Despite medical and nutritional therapies, hyperphosphatemia remains a significant concern. Dietary restriction of phosphorus remains the first line of treatment in managing hyperphosphatemia. However, traditional dietary counselling has focused





on naturally occurring phosphates in food without recognizing the increasingly common addition of phosphate additives to the food supply, thereby changing the overall phosphate content of the diet. The effects of these additives or hidden sources of phosphate are not well understood. The objectives of this presentation is to review the nutritional guidelines for phosphate management in CKD; to identify dietary sources of added phosphate; and to review Canadian labelling laws as they relate to addition of phosphate, both as a food additive and as an aid to food processing. The presentation will also review strategies and tools to better educate patients, so that their health care goals and overall well being can be achieved.

Manual measurement of blood pressure in the office: Time for an alternative

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In daily clinical practice, clinicians' blood pressure (BP) readings of patients using conventional methods are prone to inaccuracy due to either improper technique or white-coat effect experienced by susceptible patients. Inaccurate BP measurement detrimentally affects the diagnosis of hypertension and treatment decisions. Over the last 20 years, efforts have been made to improve the technique of BP measurement with automated devices. In recent years, there has been an increase in routine use of automated BP devices in the office setting for recording BP readings. Research has shown that this approach virtually eliminates the white-coat effect with manual BP measurement and provides BP readings that are very close to the patient's true BP status. Consequently, the Canadian Hypertension Education Program (CHEP) now recommends automated BP measurement in the medical office or clinic, as an alternative to the conventional BP method for management of hypertension. Nephrology nurses working in clinics are in an ideal position to advocate for implementing these CHEP recommendations. This presentation will review the limitations of manual BP measurement and examine available research evidence supporting the use of automated BP measurement in the outpatient setting. In addition, current CHEP recommendations for validated automated office devices will be provided and accurate BP measurement technique using an automated office recorder will be demonstrated.

The influence of self-efficacy on physical activity in individuals with end stage renal disease

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Background: Self-efficacy is a strong predictor of exercise behaviour. However, little information is available on this relationship in the end stage renal disease (ESRD) population. The purpose of this study was to examine and to determine factors that may contribute to this relationship.

Methods: Dialysis patients (n=132) were recruited from the KGH dialysis units and clinics. Self-efficacy was measured using the Exercise Self-Efficacy Scale and the Chronic Disease Self-Efficacy Scale. Physical activity was measured using the Human Activity Profile; Maximum Activity Score (MAS) and Adjusted Activity Score (AAS). Contributing factors of age, co-morbidities, dialysis vintage, dialysis dose, medications, and nutritional markers (i.e., albumin) were obtained from patient records.

Results: The MAS and AAS scores, which averaged 62.5±15.6 and 49.1±21.0 (SD), were lower in older versus younger dialysis patients (p<0.05) and substantively less than that in the healthy population. AAS in those with lower levels of albumin (24-34 g/L) was less than in those with higher levels (p<0.05). MAS and to a greater extent, AAS, were significantly lower in those with diabetes (n=66) compared to those without (n=66). Age and self-efficacy explained 51% of the variance in MAS. Age, self-efficacy and albumin explained 59% of the variance in AAS.

Discussion: ESRD patients have lower functional capability at any age and this difference is more pronounced with diabetes. Physical activity was substantively influenced by self-efficacy, age and serum albumin level.

Implications for dialysis care: Self-efficacy must be taken into account and used to promote greater participation in physical activity in the ESRD population.

Home, home on the (range) road

Nicole Florent, RN, BA, MPA, LLM, CNeph(C), Belleville Satellite Hemodialysis Unit, Belleville, ON

Travel by a hemodialysis patient involves a significant amount of extra work for the hemodialysis staff, as well as a certain amount of discomfort and disquiet for the patient but, once completed, the psychological benefits, added knowledge and self-assurance gained by the patient continue long after the suitcases are unpacked and the clothes have been laundered after returning home. Except in a few limited circumstances, most patients benefit greatly from the adventure of travelling

100 kilometres or 5,000 kilometres away from home. Through the actual travel and critical observation, patients experience a richness of new procedures and ideas and new relationships, as well as a more in-depth knowledge and appreciation of their home base. They learn that while their lives are irrevocably changed by their declining kidney function, and a number of activities are curtailed by their kidney disease, all is not lost and with a little bit of planning and extra work, the world is still very much their oyster, and there are still many new experiences to be had. Being able to travel means one less loss with which to contend.

This presentation identifies the advantages and disadvantages of travel for hemodialysis patients, develops a plan for the assessment of an individual patient's suitability to travel, develops an awareness of travel resources and sources, develops an understanding of the usual requirements for travel by receiving units, maximizes the suitability of a match between the patient and the receiving unit, and identifies what the patient should, and should not come back with. The second portion of the program features photographs and descriptions of actual hemodialysis units in Canada, the U.S. and on cruise ships that were visited, with concurrent comments to highlight the advantages, as well as the challenges associated with each.

Vascular access camp

Mary Larade, RN, CNeph(C), Cape Breton District Health Authority, Cape Breton, NS, and Heather MacQueen, RN, BScN, CNeph(C), Cape Breton District Health Authority, Cape Breton, NS

The demand for hemodialysis continues to grow with greater challenges around vascular access. Vascular access is one of the significant quality indicators used to determine patient outcomes in our renal program. We were inspired to develop our own vascular initiative after viewing a poster presentation from York Central Hospital Dialysis Program on their vascular camp.

We were successful in obtaining an Integrated Quality Improvement Grant from the Cape Breton District Health Authority. Our camp goal was to provide education to support and enhance clinical excellence, with a focus on vascular access. Upon completion of a four-hour comprehensive vascular access camp that included lectures, interactive booths, open discussion, and feedback, each participant would attain predetermined learning objectives.

The camp was held twice within the same week so all available staff could attend. Funds received from the grant assisted with compensating staff for their time. We assembled a multidisciplinary team to participate. We used a pre- and post-test, an evaluation form, a crossword puzzle, and a chart audit to measure quality outcomes.

Feedback from the staff was positive. The staff particularly benefited from lectures from our vascular surgeon and interventional radiologist. Results indicated a 20% improvement in the post-test. We repeated a chart audit in one month with a 17% improvement in documentation.

We now have a great educational tool encompassing all aspects of vascular access care. Overall, the camp enabled us to share evidence-based practice with everyone receiving the same information, which enhances the continuity of patient care. Whether new to dialysis or a veteran of many years, we all can benefit from continuous professional development.

Antegrade or retrograde: Which way to go?

Audrey Miller, RN, CNeph(C), BScN, St. Paul's Hospital, Saskatoon, SK, and Jennifer Larson, RN, BScN, St. Paul's Hospital, Saskatoon, SK

It is our mandate to improve patient care and outcomes in our hemodialysis populations, wherever that is possible. The literature indicates some controversy over the practice of using a retrograde arterial needle for arterio-venous fistulae (AVFs). Does the direction of the arterial needle in an AVF impact dialysis adequacy?

A group of patients was selected for placement of a retrograde arterial needle. Patients with both upper- and lower-arm AVFs were included in the study. Routine monthly blood work was used to analyze KT/V and urea reduction ratio (URR), to compare antegrade and retrograde arterial needling. This poster will present our results and conclusions for our program.

Now what do we do? A clinical review of all cases involving retained central venous dialysis catheters

Dianne Summers, RN, CNeph(C), Grand River Hospital, Kitchener, ON

It is commonly accepted worldwide that arteriovenous (AV) fistulas are considered the best access option for dialysis patients whenever possible. However, there continues to be an alarming increase in the incidence and prevalence of central venous catheters utilization in renal programs. Although simple to insert and relatively low risk when used for a short term, longer term use of central venous catheters can lead to infections, thrombosis and central vein stenosis, all of which increase the patient's morbidity and mortality. While these risks can be somewhat monitored for and readily treated, there is a more subtle and menacing type of risk that has developed over the last several years. "Retained central venous dialysis catheter" occurs when the catheter becomes lodged in situ and is unable to be removed by the usual methods without potential serious consequences. Since 2005, the Grand River Hospital Renal





Dialysis Program has had a total of 11 retained catheters. This poster presentation will provide a brief summary of the current literature, review each clinical case including an outline of options, and conclude with the solutions with which each patient was presented. While four catheters were successfully removed by a vascular surgeon, seven catheters were unable to be removed. To date, there have been no untoward effects to these patients, but the long-term effects are currently unknown. This poster presentation will provide foundational knowledge regarding this emerging complication and further supports the importance of planned access for dialysis patients.

A three-step approach to conversion of prevalent catheter-dependant hemodialysis patients to arterio-venous access

Patty Quinan, RN, Clinical Nurse Specialist—Dialysis Access, Murray J. Berall, MD, FRCP, and David C. Mendelssohn, MD, FRCP, Humber River Regional Hospital, Toronto, ON

Conversion of patients with central venous catheters (CVC) to alternate access is problematic. In October 2006, all prevalent in-centre hemodialysis patients with CVC were reviewed to determine suitability for arterio-venous access creation. We describe a three-step process to convert suitable patients to arterio-venous fistulae (AVF) or arterio-venous graft (AVG). In step one, patients were assessed to determine suitability. In step two, suitable patients were scheduled to see the vascular surgeon. In step three, suitable patients who refused AV access creation were asked to sign a waiver.

Results: In step one, 65/102 (64%) patients were deemed to have suitable vessels for AV access creation and 37/102 (36%) patients were deemed unsuitable. In step two, 18/65 (28%) suitable patients refused conversion without assessment, nine refused conversion after assessment, five were deemed unsuitable, and seven were lost to follow-up. Twenty-one out of 26 suitable patients successfully converted, three patients experienced primary failures and were, thereby, deemed unsuitable, and 2/26 are still in the process of converting. In step three, all suitable patients who refused conversion were asked to sign a waiver.

Conclusion: Conversion of patients with CVC to better forms of access is challenging. Our three-step approach was partially successful, but more research into surmounting the psychosocial aspects of resistance to conversion is required. The waiver did not prove effective in converting patients, but may be helpful for medico-legal reasons.

Better vascular access is a 'big bang for the buck' item for improved patient survival and should be considered after every access failure.

Slipping into SLED (sustained low-efficiency dialysis): Building a partnership with the intensive care unit

Vanessa Godfrey, RN, BScN, MScN, University Health Network, Toronto General Hospital, Toronto, ON, Denise Williams, RN, BScN, MN, CNeph(C), University Health Network, Toronto General Hospital, Toronto, ON, Deloris Beech, RN, BScN, CNeph(C), University Health Network, Toronto General Hospital, Toronto, ON, and Debra Appleton, RN, MN, CNeph(C), University Health Network, Toronto General Hospital, Toronto, ON

Intermittent hemodialysis (IHD) and continuous renal replacement therapy (CRRT) have historically been the primary methods of dialysis within the critical care setting. IHD is typically carried out for four hours three days a week. However, it has often been problematic in the intensive care unit (ICU) since it can lead to severe hypotension and poor clinical outcomes. CRRT is a very expensive, labour-intensive option that restricts patient activities throughout the day and night. In the past, hemodialysis nurses initiated and discontinued CRRT, and ICU nurses provided intradialytic monitoring. As an option to CRRT, sustained low efficiency dialysis (SLED) is a hybrid therapy given for eight to 12 hours, six days per week. Our centre has transitioned from CRRT to SLED and one of the goals of this project is to adapt a model of care in which ICU nurses play an active role in managing aspects of SLED treatments. In this model, ICU nurses are trained and provided with ongoing support to perform basic SLED monitoring and discontinuation. Hemodialysis nurses initiate SLED treatments and standby in the ICU to support SLED-trained ICU staff. Interviews are conducted on an ongoing basis with ICU and hemodialysis staff to determine level of comfort. One of the challenges with this model is maintaining ICU RN competency post-SLED training. The beneficial outcomes of this model include: improved partnerships with the ICU, lower supply costs, decreased ICU nursing workload, less problems with anticoagulation, less restrictions on patient activities and a more cost-effective and efficient use of nursing time and resources.

Your life, your way: A chronic disease self-management program (CDSMP) model

Sharon Stephan, RN, St. Joseph's Healthcare, Hamilton, ON

Chronic disease is a global epidemic and the leading cause of death and disability worldwide. Morbidity, mortality and disability ascribed to chronic disease account for almost 60% of deaths and 40% of the global burden of disease. The four most prominent chronic diseases worldwide include cardiovas-

cular disease, cancer, chronic obstructive pulmonary disease and diabetes. These diseases are linked by universal and preventable risk factors. Diabetes and hypertension are the most common causes of chronic kidney disease. The spotlight is on controlling key risk factors through prevention and education.

The Stanford Chronic Disease Self-Management Program (CDSMP) is an evidence-based course that helps people with chronic conditions take control of their disease and their lives. The six-week program highlights prevention, symptom management and goal setting, and offers a practice component to enhance lifestyle changes. The underlying principles of the CDSMP recognize how people with chronic conditions have similar concerns and problems, must deal with their disease(s), and the impact diseases have on their lifestyle and emotions.

Through the support of the Registered Nurses Association of Ontario (RNAO) and the Kidney Urinary Program at St. Joseph's Healthcare Hamilton, the CDSMP was recently introduced to patients on hemodialysis. Conference participants will learn how a nurse trialed the CDSMP in the hemodialysis program, understand how this program has the potential to achieve long-term benefits and healthier lives for patients with chronic kidney disease, and recognize how the CDSMP reinforces the RNAO Best Practice Guideline entitled, "Decision Support for Adults Living with Chronic Kidney Disease."

Patient knowledge and attitudes towards independent hemodialysis: A structured literature review

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Study design: A literature review of quantitative or qualitative original research.

Summary: The increasing prevalence of kidney disease and limited human and financial resources to treat kidney disease have meant that innovative ways to manage end stage renal disease (ESRD) have become imperative. Studies have demonstrated that independent hemodialysis (IHD) is a safe and cost-effective form of renal replacement therapy (RRT) with improved clinical outcomes when compared with conventional hemodialysis (CHD). Despite this recognition, less than 5% of BC hemodialysis patients are on IHD.

Objective: To better understand why patients may or may not choose IHD.

Methods: Database search included PubMed (Medline) 2004 to 2009, CINAHL and Cochrane library 1999 to 2009. Search strategies inclusion criteria: original research, English, description of patient attitudes.

Results: Fifty-four articles were found. Eight met inclusion criteria. Five key benefits and barriers to uptake of IHD were identified. Benefits included: independence, quality of life, flexibility, increased health, and self-needling. Barriers included: fear of needling, being unsupervised, low self-efficacy of treatments, burden to family, and lack of education.

Conclusion: These results support the need for more research and for developing and promoting self-care behaviours.

Implications for nephrology care: Nephrology nurses and allied staff are in a unique position to assist in educating CHD patients regarding benefits of IHD and promoting self-care behaviours.

Promoting fit feet in a hemodialysis unit

Kathleen Humphries, RN, CNeph(C), York Central Hospital, Richmond Hill, ON, Cinda Hodgson, RN, CNeph(C), York Central Hospital, Richmond Hill, ON, and Kimmy Lau, RN, MN, CNeph(C), York Central Hospital, Richmond Hill, ON

Background: The risk of lower-limb amputation is 10 times higher for patients with diabetes and chronic kidney disease. Preventive foot care is the key to minimize the rate of amputation. Most patients with diabetes and on dialysis suffer impaired peripheral sensory function and vision. As a result, self-managing preventive foot care could be a challenge. At the same time, their days are already filled with multiple visits to dialysis centres and medical appointments with specialists. Visiting a preventive foot care service is a lower priority to them. Nephrology nurses, therefore, play a significant role in educating routine foot screening and detecting foot problems at the dialysis unit.

At this regional CKD program, in conjunction with the monthly foot screening during the "Socks Down" round, the nursing team collaborates with a community chiropody health agency to support on-site chiropody care for patients on hemodialysis since December 2008.

Objective: The purpose of this project is to examine the impact of regular on-site chiropody care at the satellite hemodialysis centre.

Intervention/action: Two nurses lead this project to provide education to patients on preventive foot care. They encourage all patients at this satellite hemodialysis centre to participate in this on-site chiropody service. Every two months, the chiropody nurse visits the enrolled patients while they are on dialysis to provide assessment, education and intervention. Chiropody care includes trimming of toe nails, callous debridement, foot massage, cleaning, and education on proper footwear and foot hygiene.





Conclusion: The on-site chiropody service provides a convenient point of care for the dialysis patients. The enthusiasm of the nursing team empowers our patients to be more involved in promoting fit feet and reducing risk of foot ulcers.

Learning is not a spectator sport: The restructuring of an orientation program

Kim Hendrick, RN, CNeph(C), Grand River Hospital, Kitchener, ON, Leanne Tremain, RN, Grand River Hospital, Kitchener, ON, Karen Campbell, RN, CNeph(C), Grand River Hospital, Kitchener, ON, and Steve Gobran, RN, BScN, CNeph(C), Grand River Hospital, Kitchener, ON

This poster will show how the Grand River Hospital hemodialysis program restructured its nursing orientation program into a progressive learning model. The poster will clearly outline the transition from before, during, and after the process. Adult principles of learning were utilized to rebuild the current orientation into a more dynamic and interactive process. This will include the first weeks of the program that were structured and content-based, as well as the evolution to the progressive learning model.

The poster will illustrate how the learners were tested to assess knowledge levels and learning needs. The process to develop individualized learning plans with active learner input will be included. The value of learner participation into this plan will be demonstrated by the inclusion of participant surveys. Process review by the education practice lead, skills educators and clinical manager as a group and with the learners at strategic points will be outlined. The poster will conclude with the lessons learned and suggestions for improvement for future orientations.

Changing the way we work

Doris Kane, LPN, Capital Health, Halifax, NS, Leslie Jackson, RN, Capital Health, Halifax, NS, and Sandy Lee Cranston, RN, Capital Health, Halifax, NS

Working in a busy clinic that provides acute and chronic hemodialysis treatments can be challenging for staff. Ensuring an adequate supply of health human resources now and in the future is also challenging. Imperative to safe patient care is

ensuring the right person is providing the right care at the right time and that no resources are being wasted. Our hemodialysis unit embarked on a new initiative "Changing the Way We Work", to create a practice environment in which RNs, LPNs, and NPs could optimize their respective scopes of practice within the hemodialysis unit to meet the needs of the patient population that we serve. An important component of the "Changing the Way We Work" initiative was to effectively integrate the support personnel into the care team. A working group consisting of LPNs, RNs, NP, renal assistants, nurse educators, a professional practice leader and the manager embarked on this journey to engage nurses and renal assistants as active participants in creating change and decision making at the point of care. This poster presentation will highlight the many tools and the work that was completed within our hemodialysis unit by the staff to create a patient/family-centred work environment, which supports nurses to work to their full scope of practice and provides an environment that supports effective utilization of the support staff.

The expanding role of the LPN

Doris Kane, LPN, Capital Health, Halifax, NS

The LPN has been a member of the hemodialysis team in our unit for the past 18 years. With the increasing volume of dialysis patients, it became more evident that the knowledge/skill and competency of the LPN needed to be drawn upon in a more effective manner. Historically, the role of the LPN was to act in the capacity of "ward aid". For example, the LPN role included weighing patients, assisting with blankets/snacks, and washing machines. The role of the LPN has evolved over the last eight years to maximize their scope of practice to help meet the needs of the patient population they service. To meet the educational requirements to fulfill these new competencies, the LPN was provided with educational opportunities to learn how to prime the dialysis machines, needle established fistulas, and perform transonic measurements, and education on how to work in a collaborative care model with RNs in the delivery of care for identified stable patients. Additionally, an initiative in the hemodialysis unit began in 2007 with a mandate to ensure that the right person was providing the right care at the right time for the right patient population. In accordance with this objective, the LPN scope of practice was further enhanced to include education on medication administration and care of stable tunnelled CVC catheters. All of these efforts have enabled LPNs to maximize their practice, thus enabling the RN to be able to coordinate and develop the plan of care for our dialysis patients.

The effects of an intra-dialytic exercise program on self-efficacy and physical activity

Hilary Felice, BSc, MSc(c), Queen's University, Kingston, ON, Trisha Parsons, BSc(PT), PT, PhD, Queen's University, Kingston, ON, Edwin Toffelmire, MDCM, FRCPC, FACP, Queen's University, Kingston, ON, and Cheryl King-VanVlack, BSc, MSc, PhD, Queen's University, Kingston, ON

Background: Low levels of self-efficacy (SE) with respect to exercise may contribute to a sedentary lifestyle in the ESRD population. Therefore, we examined the effects of an eightweek intra-dialytic (ID) exercise program on SE and physical activity (PA) in hemodialysis (HD) patients.

Methods: HD patients were randomized into an exercise group (EX, n=4) or a control group (CON, n=4). The EX group cycled for approximately 60 minutes during HD, thrice weekly for eight weeks. The CON group continued with the usual activity. At eight weeks, both groups could participate in the exercise program. PA was determined using the Human Activity Profile (Maximal Activity Score, MAS; Adjusted Activity Score, AAS) and SE was evaluated using the Chronic Disease Self-Efficacy Scale (CDSES) and Exercise Self-Efficacy Scale (ESES). Measures were obtained at pre-, post- and eight weeks following the intervention.

Results: No significant changes in PA or SE occurred between or within groups at any time point. Limited statistical power due to the small sample size and a ceiling effect due to initial high-function levels of the sample may have contributed to the lack of significant changes. MAS, AAS, CDSES, and ESES were generally lower in the control group. When corrected for age and serum albumin, these discrepancies between the groups were reduced.

Conclusions: Age and albumin must be taken into account when assessing physical activity in HD patients.

Implications for dialysis care: Recruitment of additional participants will determine the role of ID exercise in enhancing exercise self-efficacy and physical activity in HD patients.

"Ventilated dialysis patient" or "Ventilated patient on dialysis"? Providing appropriate care to a complex patient with changing medical needs

Kim Hendrick, RN, CNeph(C), Grand River Hospital, Kitchener, ON, and Ken Roberts, MSW, Grand River Hospital, Kitchener, ON

The purpose of this case study is to review the challenges and obstacles experienced by the multidisciplinary care team involved in developing a plan of care for a very complex renal patient with escalating and altering care needs. This case presentation will demonstrate the connection between the patient's medical needs and the multiple stakeholders involved, the demand on resources, the costs associated, and the overall management of care. The case study will be presented chronologically, and will provide details regarding how the team balanced the escalating complexity of care needs, which included dialysis, intubation and ventilator dependency with the patient's own advanced directives, and the larger ethical dilemma faced by team members. This poster will address how care needs and decisions were made, while also considering the values and ethical concerns expressed by each team member, especially when the complexity of services exceeded the team's initial assessments during the early days of care. The tension between patient choices and the organization's ability to effectively provide services to meet these choices will also be illustrated. A decision protocol will be presented that was utilized during this specific case, with the hope that it will assist others, as similar situations become more prominent in health care today.

Nursing responsibilities regarding vascular access: Primary nurse versus assigned nurse: Two views—One direction

Karen MacDonald, RN, CNeph(C), Cape Breton District Health Authority, Cape Breton, NS

Purpose: Vascular access is a vital component in hemodialysis. Preserving a good, functioning access relates directly to optimal patient care and quality of life. Maintaining an adequate access or prevention of complications requires use of the nursing process (assessment, planning, implementation and evaluation).

Description: Vascular access is a concern to all caring for the patient in the hemodialysis setting. Clear communication is a powerful tool in patient care. My presentation involves comparing the nursing responsibilities of the primary nurse and the assigned nurse. This involves two different views with all working in the same direction toward optimal patient care regarding vascular access.

Evaluation/outcomes: My target audience was the nursing staff working in the hemodialysis unit where I work. The responsibilities and expectations of the primary nurse and the assigned nurse regarding vascular access were the focus of the fistula camp seminar. Following the workshop, random chart audits revealed positive outcomes. However, it is a work in progress. Overall, I feel there was a beneficial response to the presentation.

Implications for nephrology practice/education: Without a vascular access, one cannot perform hemodialysis. The patient's access is their lifeline. Professionally and ethically, as nurses, we are obliged to treat the vascular access with the utmost importance in delivery of patient care. Maintaining the vascular access keeps hemodialysis as an option for treatment in end stage renal disease. This is a life-sustaining measure.





Improving program excellence... Improving patient care

Carmen Berglund, RN, BScN, Saskatoon Health Region, Saskatoon, SK, Julie Nhan, RN, MN, CNeph(C), Saskatoon Health Region, Saskatoon, SK, and Diane Shendruk, RN, Saskatoon Health Region, Saskatoon, SK

As of March 2010, 27% of dialysis patients at Saskatoon Health Region are receiving peritoneal dialysis (PD). This is a home-based dialysis therapy, where patients can continue to live in their own homes. What is the secret to our program's success when the national average is around 20%? The secret is with our multidisciplinary team of nurses, physicians, manager, pharmacist, dietitian and social work, who continuously strive to improve patient care and to promote best practices for optimal patient outcomes.

The PD program had a clear purpose: to support and empower our patients so they can continue to manage themselves at home. This requires offering ongoing education on prevention and health promotion, implementing quality improvement projects to incorporate best practices, and providing self-management skills to our patients so they can better deal with unforeseen complications/obstacles. Some of the innovative approaches that were undertaken include coordinating patient education days, initiating a peritonitis prevention clinic and implementing a consistent approach in assessing PD exit sites in clinics.

The hope is that these innovative approaches at the Peritoneal Dialysis Program at Saskatoon Health Region will not only help our patients to "live well" on PD, but it will also provide them with the skills to better manage themselves at home.

Redesigning the peritoneal dialysis teaching manual at the Capital District Health Authority, Halifax, Nova Scotia

Carrie Ann Boyd, RN, CNeph(C), Capital District Health Authority, Halifax, NS

The Capital District Health Authority Home Peritoneal Dialysis (PD) program has been teaching patients and their families self-care continuous ambulatory peritoneal dialysis

(CAPD) and cycler peritoneal dialysis since 1981. A *Peritoneal Dialysis CAPD Teaching Manual* that was developed by the home dialysis nursing staff is a key teaching tool that is used to teach patients and families to perform peritoneal dialysis safely at home. Upon critical evaluation of the components of the *Peritoneal Dialysis APD Teaching Manual*, it became clear to nursing staff that the teaching manual appeared to be more "nurse focused" than "patient-/family-focused".

This poster will outline the planning, development and implementation process for revision of the CAPD teaching. It will provide the CAPD manual Table of Contents, Health Assessment, Readiness Ruler and Patient Satisfaction tools that have recently been developed and added to the manual and implemented. It will also provide several new and innovative key teaching components that have been developed and incorporated into the *Peritoneal Dialysis CAPD Teaching Manual*. This poster will identify the key stakeholders involved in the evaluation, process redesign and implementation of the new *Peritoneal Dialysis CAPD Teaching Manual*.

Telemonitoring in the renal program: Empowering patients and engaging providers

Deb Bezaire, RN, BScN, MHST, London Health Sciences Centre, London, ON

London Health Sciences Centre (LHSC) is a university-affiliated teaching hospital with an active renal program caring for approximately 100 peritoneal dialysis (PD) patients. In an effort to enhance patient care and embrace the concepts of self-management, LHSC embarked on a pilot project with Baxter Corporation, which utilized an external health coach and a telemonitoring station installed in the patient's home. The purpose of the project was to assess quality of life and ease of use of the telemonitoring station through Patient Satisfaction and Quality of Life surveys. The telemonitoring station is an interactive device that asks patients a series of questions, on a daily basis, related to their therapy, continuous ambulatory peritoneal dialysis (CAPD) or automated peritoneal dialysis (APD) and diabetic status.

Patients were randomized (28 intervention and 21 control) and enrolled in the study. On a daily basis, the health coach and nursing staff assessed the patient responses, which were stratified by colour on a dashboard, red requiring immediate nursing response and orange or yellow requiring coaching intervention. Two-way videoconferencing was also available. Due to the size of the study, statistical significance was not the goal. However, the intervention group saw a lower percentage of patients transferred to hemodialysis, and decreased annualized rates for both emergency room (ER) visits and hospitalizations. Our poster presentation will provide information on individual case studies related to timely assessment and intervention, as well as nurse and patient satisfaction data.

Based on the favourable results of the pilot study, the LHSC program has chosen to continue the use of telemonitoring in the PD patient group. We believe the use of this technology will lead to more timely assessment and intervention of potential problems, decreased ER visits and hospitalizations, as well as assist the patient in becoming a better self-manager of his/her chronic condition.

Renal Health Outreach (RHO) in Manitoba: Opportunities for improvement?

Lesley Cotsianis, OT Reg. (Mb.), Health Sciences Centre, Winnipeg, MB, Alison Lindsay, RN, BN, BHEc, Health Sciences Centre, Winnipeg, MB, and Joanne Plamondon, RN, CDE, CNeph(C), St. Boniface Hospital, Winnipeg, MB Introduction: The Manitoba Renal Program's (MRP) RHO interdisciplinary team (nurses, dietitians, pharmacists, an exercise therapist, an occupational therapist, and an Aboriginal liaison coordinator) has provided renal health education to First Nation communities in Manitoba since 2001. The RHO team educates health care providers and the public regarding risk factors and early identification of renal disease.

Purpose: This project seeks to explore perspectives of key stakeholder groups regarding important content delivery methods, and barriers to provision of renal health education in First Nation communities.

Methodology: Five open-ended, semi-structured focus groups with a total of 32 participants were conducted in June and July 2009 to gather perspectives of community members and health care providers, elders, and leaders of a First Nation community in Manitoba, as well as the MRP staff. Qualitative description was used to identify themes.

Findings: Consideration of environmental and contextual factors in communities is important, along with building partnerships between communities and current health care programs. Multiple delivery methods (including storytelling and interactive lectures) are preferred methods to engage community members. Many community participants felt that hearing stories from people living with renal disease was valuable, as well as providing renal health education to children. Health care providers emphasized the importance of early identification and screening, which was not identified as a priority by community members.

Outcome/implication: The participant perspectives obtained in this study will help guide future directions for RHO in Manitoba, providing increased relevancy of renal health education for First Nation communities.

CKD outreach: A collaborative approach in Aboriginal communities

Mary Lou Dyck, RSW, BSW, St. Paul's Hospital, Saskatoon, SK, Iris Keindel, RN, St. Paul's Hospital, Saskatoon, SK, and Carolyn Cyr, University of Saskatchewan, Saskatoon, SK

The Saskatoon Health Region Chronic Kidney Disease (CKD) Aboriginal Outreach Program is partnering with chronic disease management programs in central and northern Saskatchewan with the goal of increasing the opportunity for early CKD diagnosis and management in First Nations and Métis communities. This population is known to be at risk for CKD due to the high incidence of diabetes, hypertension, and by virtue of race. The clinical arm of the CKD program provides clinical management and education to individuals diagnosed with stage 3 and 4 kidney disease. However, the percentage of First Nations and descendants' follow-up in

the CKD clinic (15%) is disproportionately low compared to the percentage on dialysis (33%). Statistics prompted the formation of the CKD Aboriginal Outreach Program (2007), which provides culturally sensitive education and screening programs at a community level, in order to diagnose CKD at an earlier stage and to prevent the progression to renal failure and dialysis.

Due to the barriers that Aboriginals encounter resulting from the social determinants of health, their attendance in the CKD clinic's renal education classes is also low. To overcome these barriers, the CKD Aboriginal Outreach Program travels to communities to provide educational presentations. These presentations are given to a variety of clients, including health care professionals, students, elders and communities in diverse settings such as schools, hospitals, clinics, wellness centres, treaty days, and health fairs. CKD Aboriginal Outreach program complements the chronic disease management initiatives to increase awareness, screening, prevention, and health promotion in First Nations communities.

The journey of bringing pre-dialysis care closer to home

Shirley McCarthy, RN, Stevenson Memorial Hospital, Alliston, ON, Catherine Ronan, RN, CNeph(C), Stevenson Memorial Hospital, Alliston, ON, Patricia Watt, RN, Stevenson Memorial Hospital, Alliston, ON, Lorraine Johnston, NP, Stevenson Memorial Hospital, Alliston, ON, and Doreen Neamtu, RN, Stevenson Memorial Hospital, Alliston, ON

This presentation will share our experience with developing and implementing a pre-dialysis care clinic in our satellite unit at Stevenson Memorial Hospital in Alliston, Ontario. This is a service that had not been provided locally for patients with chronic kidney disease (CKD). Prior to this, CKD patients would travel approximately 70 km to Orillia Soldiers Memorial Hospital in Orillia to receive this service.

With the dedication of staff (physician and nurses) and the support of the hospital administration, we are now providing





this care. We are still in the early stages of developing our program and now provide all disciplines of this care including: nephrologists, registered nurses, nurse practitioner, diabetes education clinic, dietitian, pharmacy, and social worker support. Our clinic is rapidly growing, as local physicians become aware of its presence. We started this service in November of 2009. We have had excellent feedback from patients who are grateful to not have to travel so far for care, given limited resources for travel expenses. We have found that patients who didn't go to the pre-dialysis clinic at the home unit before due to distance are now attending.

With the support of our home unit at Orillia Soldiers Memorial Hospital, we have provided a general education day via telemedicine for selected patients. It is still a work in progress, but a journey that ensures all patients have the opportunity for care closer to home.

Highlighting collaborative learning and sharing in a provincial renal educators group

British Columbia Renal Educators Group with Lead, Wanda Dean, RN, BSN, Prince George, BC

Purpose: Developing consistency in nursing nephrology practice across the province of British Columbia historically has been difficult due to geographical challenges and, at times, competing priorities. The purpose of this poster presentation is to highlight how the British Columbia Renal Educators Group (BCREG) works together to overcome these challenges in an attempt to standardize nephrology care across the province.

Who we are: The BCREG began informally in 2002 with key educators in different parts of the province "keeping in touch" via email and teleconference around practice issues/concerns. Collectively, the group would work towards resolution but with no formal structure in place, their impact provincially was minimal. As the number of educator positions increased, the need to formalize became more apparent and the British Columbia Provincial Renal agency moved to incorporate funding for the group into their operating budget in 2006.

What we do: Currently, the group meets monthly via teleconference and is funded to meet twice annually for a face-toface meeting with an educational component. Annual work plans are developed and committees are formed around the project work. An important focus for the group is around guideline development with the intent to standardize nursing nephrology practice provincially. Resource sharing, mentorship and support for group members are vital components of the group.

Formal medication reconciliation process in an outpatient hemodialysis program

Julie Cates Scott, BScPhm, ACPR, PharmD, RPh, Grand River Hospital, Kitchener, ON, Shelley Parker, BSc, BSc(Pharmacy), RPh, Grand River Hospital, Kitchener, ON, and Vivian Ng, BScPhm, ACPR, RPh, Grand River Hospital, Kitchener, ON

The purpose of this poster presentation is to demonstrate the process of completing medication reconciliation (Med Rec) at least every six months for all hemodialysis outpatients, with the best possible medication history (BPMH) updated in the electronic chart. Recognizing medication reconciliation is an industry best practice, and a Required Organizational Practice by Accreditation Canada, a formal Med Rec process was implemented. A pharmacy technician reviewed the patient list monthly and provided reminder notes to identified patients to bring in all of their medications. When the patient brought in his/her medications, the nurse would complete a "BPMH Update Form" to document any discrepancies. The BPMH Update Form was reviewed and signed by the nephrologists during his/her next patient rounds. Changes were then updated in the electronic charting system by the nurse. Specific criteria for pharmacist referral were defined within the policy. Prior to implementation, a sample audit of 48 charts indicated 87% of patients had a BPMH recorded within the previous six months. However, only 70% had been signed by the physician and updated in the electronic record. Six months following implementation of the formal process, the performance improved to 90%. The key implication for practice within nephrology is introducing a shared responsibility model, with clearly defined roles for nursing, pharmacy, and physicians. This model proved successful during the implementation of Med Rec in an outpatient hemodialysis setting, and may be appropriate for other implementation projects in the future.

Determining the test-retest reliability of a low-cost measure of arterial stiffness

Jenny Picoulet, MSc(c), Queen's University, Kingston, ON, Edwin Toffelmire, MDCM, FRCPC, FACP, Queen's University, Kingston, ON, Cheryl King-VanVlack, BSc, MSc, PhD, Queen's University, Kingston, ON, and Trisha Parsons, BSc(PT), PT, PhD, Queen's University, Kingston, ON

Increased arterial stiffness is associated with a higher risk of cardiovascular events. In patients with chronic renal disease, this risk appears to be far greater than in the general popula-

tion. Several methods are available to determine arterial stiffness, and pulse wave velocity (PWV) appears to be the most accurate. Applanation tonometry (AT) is the gold standard method to measure PWV. Although non-invasive and predictive of adverse cardiovascular outcomes, this method is technically challenging and expensive. An innovative, non-invasive tool using the principle of reflectance photo-plethysmography to detect cardiovascular pulse waves has recently been developed. This device has previously been shown to be a valid index of PWV, as compared to the AT technique in healthy subjects. The purpose of this study was to determine the test-retest reliability of this device.

Healthy volunteers were recruited to participate. Infra-red probes were placed over the point of greatest pulse at the carotid and radial arterial sites. Signals were acquired for one minute, following which the apparatus was removed from the patient and reapplied for a total of three tests within a given day. Trials were repeated on three separate occasions, each visit being one to seven days apart. Testing was performed at the same time of day and under similar conditions.

To date, eight subjects have been recruited. The preliminary results show a mean coefficient of variation of 12.3%.

The preliminary results suggest that this device may offer a reliable, low-cost alternative for the clinical assessment of PWV.

The journey to the chronic care model

Linda Kloosterman, RN, BScN, CNeph(C), Baxter Canada, and Colleen Cuddy, RN, MHS, Ottawa Hospital, Ottawa, ON

Redesigning a renal health care system from a reactive to a proactive approach to chronic kidney disease (CKD) is our greatest opportunity in this century. The Ottawa Hospital, in partnership with Baxter Canada, is transforming the nephrology health care system today using a grassroots strategy for chronic kidney disease prevention and management. Our project is designed to improve and enhance quality patient care delivered to nephrology patients.

Our process involved a comprehensive needs assessment across the entire renal organization at The Ottawa Hospital. A total of 16 focus groups and feedback from all key stakeholders from leadership to front-line staff were included in order to assess the programs' strengths and opportunities for improvements in the care and management of patients living with CKD. Opportunities were explored using the Expanded Chronic Care Model as our framework for discussion. Benchmark data obtained from patient satisfaction surveys and employee satisfaction surveys provided another objective opportunity for evaluation by the teams, as to where they could focus their efforts.

Leveraging the team's strengths and prioritizing opportunities for improvement, the team's focus to identify rapid cycle improvement using lean opportunities in the areas of: longitudinal care/transition points and self-management support for patients living with CKD. Change is complex and our ability to prioritize and focus will support our success to transform how renal care services will begin to evolve.

Use of the Health Outcomes for Better Information Care (HOBIC) safety measure to determine the prevalence of falls among hemodialysis patients

Ann Jones, RN(EC), MSN, CNeph(C), St. Michael's Hospital, Toronto, ON, Anita Amos, RN, BScN, CNeph(C), St. Michael's Hospital, Toronto, ON, and Anne Stephens, RN, MN, St. Michael's Hospital, Toronto, ON

Falls have a devastating impact on an individual's functional status and quality of life. In the general population, falls are a leading cause of accidental death among the elderly (Fuller, 2000). Adults over the age of 65 are at increased risk of falls, hip fractures, delayed recovery, and impaired functional status prompting the need for rehabilitation (Cook, Tomlinson, Donaldson, et al., 2006; Fuller, 2000). The average age of patients receiving HD at St. Michael's Hospital is approximately 61 years of age. The purpose of this survey was to determine the proportion of HD patients who experienced falls within a 90-day period. Description: The falls Health Outcomes for Better Information Care (HOBIC) safety measure was used to survey whether patients experienced falls in one of three categories: no falls in the last 90 days; no fall in the last 30 days, but fell 31 to 90 days ago; one fall in the last 30 days. Evaluation/outcome: 174 of 210 HD patients were surveyed. The average age of the patients was 63.5 years. Twenty falls were reported. Eighteen (18) of 23 patients (78%) who fell were 65 or older. Implications for nephrology practice/education: HD patients over 65 at SMH are at an increased risk of falls. Further investigations of the patient characteristics and contributors of falls are required. Determining whether a patient has had a fall is an important nursing assessment. Interventions should target patients at high risk for falls.





Redesigning chronic kidney disease (CKD) services in northern British Columbia

Sue Saunders, RN, BSN, MScN(c), Northern Health, Prince George, BC

Background and context: Early identification and treatment of chronic kidney disease (CKD) can result in the prevention and/or delay of complications related to decreased kidney function. The Northern Renal Program Chronic Kidney Disease Clinic located in Prince George, B.C., is currently the only outpatient renal clinic in Northern Health; a health authority serving the health care needs of approximately 300,000 people residing over an area of approximately 600,000 square kilometres.

To date, the Northern Renal CKD Clinic serves the predialysis needs of approximately 520 patients with GFR <50 ml/min. However, the number of patients requiring service has grown exponentially. Due to limited resources and time, the CKD team is currently only able to see new referrals at stage 4 or later in the disease progression, thereby limiting the capacity to slow progression and prevent associated disease processes.

Project: In September 2009, the Northern Renal Program began a project to redesign the services of the CKD clinic to better meet the needs of Northern Health residents and, ideally, bring services closer to home. Nephrology nurses from across the country have given input to assist us in this endeavour. This presentation will report on the process and findings of the project to date, emphasizing the need to draw from a myriad of resources both nationally and at the community level.

Nursing care in 2010 and beyond: Attitude is everything

Fran Boone, RN, London Health Sciences Centre, London, ON, Sue Molloy, RN, London Health Sciences Centre, London, ON, and Catherine de Ruyter, RN, London Health Sciences Centre, London, ON

Life is a continuous process of change and the hospital environment is no exception to this fact. Change is like a "mosaic"—constantly shifting, and it can be difficult to keep up with the pace. The challenge to balance the daily stresses of work and

home faces all nurses on a daily basis. As health care providers, we interact with everyone we meet in a positive or negative way.

This presentation will highlight personal insights from a recent autobiography, *A Stroke of Insight*, by Jill Bolte Taylor, PhD. This brain scientist suffered a stroke and, during her hospitalization, was able to determine which nurse had a touch or a caring word and communicated a feeling of safety. Although she could not comprehend the spoken word, the facial expression and body language spoke volumes as to the nurse's level of compassion. What is this quality? What does the nurse need to know to develop this approach when communicating with patients?

Our interactive presentation will present some simple "ABC" exercises that nurses can utilize to develop a more positive and caring attitude. These strategies can easily be incorporated into one's daily routine and learning them will assist one in becoming more centred when interacting with patients and staff. This, in turn, will prepare nurses to cope more effectively with the continuous stresses in life and not only "survive, but thrive!" Anything is possible... if you are willing to try!

Hydrothorax complication of a child on nocturnal intermittent peritoneal dialysis (NIPD)

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A three-year-old boy with end stage renal disease (ESRD) due to bilateral renal dysplasia was switched to peritoneal dialysis (PD) after vascular access failure on intermittent haemodialysis. PD, with a Tenckhoff catheter, was started seven weeks after insertion. He was doing well until, on physical exam 45 days after the beginning of PD, abnormal findings on pulmonary auscultation were uncovered. Chest x-rays showed a right-sided pleural effusion suggestive of hydrothorax. Thoracocentesis confirmed the presence of peritoneal fluid in the pleural space with a high glucose concentration. The nature of the peritoneo-pleural communication was identified by peritoneal scintigraphy showing a massive hernia. Despite conservative treatment used in this patient with different postures and decrease in the infusion volume, the clinical situation worsened with respiratory problems leading to a second thoracocentesis. Because of the recurrence of hydrothorax, PD had to be stopped and the patient was switched to haemodialysis. Hydrothorax secondary to the peritoneo-pleural leaks is a rare (1%), but serious, complication of PD in children. Intraperitoneal pressure (IPP) measurements could be useful to prevent it and systematic pulmonary x-rays, one week after maximal intraperitoneal volume is reached, could help to diagnose this complication before the clinical consequences.

The culture of vascular access cannulation among nurses in a chronic hemodialysis unit

By Barbara Wilson, RN, MScN, CNeph(C), Lori Harwood, RN(EC), MSc, CNeph(C), Abe Oudshoorn, RN, PhD(c), and Bonita Thompson, RN, BA

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Abstract

The native arteriovenous fistula (AVF) is the vascular access of choice for patients on chronic hemodialysis (HD) because of its longevity and lower complication rate. Yet from 2001 to 2004 in Canada, there has been a notable increase in both incident and prevalent central venous catheter (CVC) use with a corresponding decrease in AVF use over the same time period (Moist, Trpeski, Na, & Lok, 2008). A similar trend has been found in other countries (Moist, Chang, Polkinghorne, & McDonald, 2007). There are a number of contributing factors to low AVF use in patients on chronic hemodialysis. While some of these factors may be patient-related, nursing interventions specific to cannulation may be a contributor. To date, little is known about HD nurses' attitudes and experiences regarding cannulation.

The purpose of this study was to describe the culture and everyday practices of vascular access cannulation of the AVF from the perspective of the HD nurse. An ethnographic research design was employed, utilizing qualitative methods. Ten HD nurses were interviewed using a semi-structured interview tool, and a number of themes were generated from the interviews. One overarching

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theme of "perpetual novice" was evident, acknowledging the failure to transition from novice to expert cannulator despite working in HD for a number of years. Other common themes that emerged from the interviews were a) the lack of fistulas, b) the fistula as a "hard sell" to patients, c) the skill of cannulation, and d) the assembly-line approach to care. As a result of a number of factors, HD nurses were unable to acquire the skills necessary to become an expert cannulator. Moreover, the decrease in opportunities to practise cannulation has resulted in wide variation in skill level among HD nurses. To improve cannulation skills and achieve successful cannulation of AV fistulas, HD nurses identified a number of educational strategies that should take place. They also identified the need for an improved documentation system in order to track cannulation-related problems. Results of this study may be helpful in understanding the culture of cannulation in a chronic HD unit and in directing future educational, supportive, and practice interventions for HD nurses.

Key words: arteriovenous fistula, vascular access, cannulation, nursing skills

Introduction

Vascular access is referred to as the "lifeline" for individuals receiving hemodialysis (HD). Clinical practice guidelines in both the U.S. and Canada recommend the arteriovenous fistula (AVF) as the preferred type of access for patients requiring chronic HD. The AVF is the vascular access of choice for HD because of its longevity and lower complication rates when compared to arteriovenous grafts (AVG) and central venous catheters (CVC) (Jindal et al., 2006; NKF, 2006). While the associated costs of vascular access are high among all HD patients, AVF use is associated with the lowest costs during the first year of HD (Manns et al., 2005). Furthermore, initiation of HD with a CVC is associated with significantly higher mortality and morbidity—including known risks such as infection, central vein stenosis, and thrombosis—than for those individuals commencing HD with an AVF (Moist, Trpeski, Na, & Lok, 2008; Polkinghorne, McDonald, Atkins, & Kerr, 2004; Xue, Dahl, Ebben, & Collins, 2003).

Yet, despite the numerous disadvantages of CVC and the advantages associated with AVF use, results from the Dialysis Outcomes and Practice Patterns Study (DOPPS) suggest that AVF use is less than optimal (Rayner et al., 2004). In Canada, a recent review of data from the Canadian Organ Replacement Registry (CORR) from 2001 to 2004 demonstrates an increase in both incident (76.8% to 79.1%) and prevalent (41.8% to 51.7%) CVC use with a corresponding decrease in AVFs over the same time period that could not be explained by changes in patient characteristics (Moist et al., 2008). A similar trend has been found in other countries, as well (Moist, Chang, Polkinghorne, & McDonald, 2007). A number of contributing

factors have been suggested for the declining use of AVFs. These include patient-related demographic and clinical factors such as the increasing age of the end stage renal disease population, a higher proportion of diabetics, and multiple co-morbidities including extensive peripheral vascular disease (Allon & Robbin, 2002). In addition, Moist et al. (2007) suggested that changes in practice patterns within dialysis facilities and patient preferences against AVF creation may be factors, as well.

Cannulation is an essential skill necessary for all hemodialysis nurses in order to provide HD treatments and, while both the AVF and AVG require this skill, cannulation of the AVF was specifically chosen for this study. Cannulation-related complications may be significantly higher in patients with AVFs, as compared to those with an AVG (van Loon, Kessel, van der Sande, & Tordoir, 2009a). Furthermore, our HD unit has few AVGs, accounting for only 1% of total vascular accesses.

Ongoing patency of the AVF depends on a number of factors. In addition to the quality of blood vessels and surgical technique used to create the AVF, the way in which the AVF is handled and cared for by the dialysis staff may also affect patency and, ultimately, AVF use (van Loon, et al., 2009b). At our centre, the registered nurse (RN) is responsible for cannulation of the AVF and for the purposes of this paper, the term HD nurse will be used throughout. The authors recognize that some HD centres employ registered practical nurses (RPNs) and other dialysis staff for cannulation.

Unsuccessful cannulation may result in trauma to the AVF or access loss and, thereby, necessitate the need for CVC placement, which, in turn, may result in an increase in CVC use and a decrease in AVF use. Therefore, cannulation skills may be an additional factor contributing either positively or negatively to AVF use. Yet, there is very little research available specific to cannulation and even less on nurses' attitudes and experiences with cannulation.

Literature review

At the present time, available literature would suggest that there is significant variability in the use of AVFs for HD and this variation would appear to occur within HD programs, across regions, and between countries. In a recent study by Xi et al. (2010), nephrologists from across Canada and the U.S. were surveyed to examine patient variables that they considered when determining the timing and type of HD access, perceived barriers, and absolute contraindications to arteriovenous (AV) access creation. Nephrologists were more likely to refer patients for an AVF if they were less than 65 years of age, had minimal co-morbidities, and no prior history of failed AV access. In older patients and those with increased co-morbidities, Canadian nephrologists indicated a preference for the CVC. Perceived barriers to establishing a mature AVF included patient refusal for creation (77%), refusal to be cannulated (58%), and high failure-to-mature rates (52%) (Xi et al., 2010).

A number of complications can arise from cannulation of the AVF including hematoma, aneurysm formation, infection, and miscannulation requiring more than one needle for arterial or venous connection for the HD treatment (van Loon et al., 2009b). One study examining cannulation-related complications in HD is reported in two separate publications by van Loon et al. (2009a; 2009b). The studies used a

prospective, observational design and compared newly placed AVFs and AVGs in 120 incident HD patients during the first six months of cannulation with two needles. A number of outcomes were examined, including the types and frequency of cannulation-related problems, factors associated with successful and unsuccessful cannulation, CVC dependence, and the frequency and factors associated with AV access failure. Cannulation techniques and practices used by the HD nurses were also examined. During the six-month follow-up period, only 9% of patients with a vascular access (AVF or AVG) had uncomplicated cannulations with two needles for every treatment, while miscannulations occurred in 31% of patients (van Loon et al., 2009a). The frequency of miscannulations with AVFs was two times higher than with AVGs, and cannulation-related complications were significantly higher in the AVF group resulting in the use of single-needle dialysis (33%), when two needles were not possible, and 22% of patients required a CVC placement for HD (van Loon et al., 2009a). Furthermore, cannulation-related problems resulted in either CVC placement or single-needle use and were significantly associated with AV access failure (van Loon et al., 2009a). No predictors were found to be associated with successful cannulation and the experience level of the HD nurse was not a significant factor (van Loon et al., 2009b).

While van Loon et al. (2009b) concluded the experience level of the HD nurse was not predictive of successful cannulation of the AVF, results from the DOPPS analysis would suggest otherwise (Pifer et al., 2002). The DOPPS study examined the impact of professional HD staff experience on vascular access (AVF and AVG) outcomes. Results demonstrated that for each 20% increase in the percentage of experienced HD staff (i.e., those working in HD > 3 years), a reported 11% decrease in AVF and AVG failure was realized (Pifer et al., 2002). Pile (2004) contends that the DOPPS findings lend support for the need for education, protocols and procedures, as well as mentoring of staff members who manipulate and care for vascular access, as critical to successful patient outcomes. Certainly, the use of a multidisciplinary team approach has been shown to increase AVF creation (and decrease AVG placement), with one component of the program that includes a comprehensive HD staff education program (Nguyen, Griffith, & Treat, 2003).

Vascular access preferences among hemodialysis nurses and patients have been examined in two studies. The first study by Bay, Van Cleef, and Owens (1998) surveyed 129 individuals on HD and 64 medical personnel (nephrologists, access physicians, dialysis nurses and technicians) about their preferences and concerns regarding vascular access. The access preferred most by physicians was the AV fistula in the lower arm, while nurses preferred the AVG in the lower arm. Patients, however, preferred an access in the forearm that was easy to cannulate, had minimal effect on their appearance, provided quick hemostasis after dialysis, and enabled arm comfort during dialysis. In addition, patients were most concerned about pain during needle insertion, while physicians' concerns pertained to thrombosis and infection of the vascular access.

The second study by Young et al. (2002), as part of the DOPPS study, examined vascular access preferences among medical directors and nurse managers, as well as practices

within a number of HD facilities in the U.S. They found that 21% of medical directors and 40% of nurse managers preferred the AVG for HD. Interestingly, patients who reported a preference for the AVG were more than twice as likely to have an AVG than an AVF. The investigators suggested that staff preference for one type of access over another may influence the type of access created. Neither study explored nurses' attitudes and experiences regarding cannulation.

Cannulation is an essential skill for all HD nurses. Based on a review of the literature regarding cannulation practices and from observations made in our HD unit, it would appear that cannulation-related complications continue to be a significant problem. With the gradual decline in AVF use in recent years, efforts aimed at understanding the reasons for this trend are essential. To date, there have been no studies examining cannulation from the nurse's perspective and little is known about cannulation-related problems as experienced subjectively by the HD nurse.

Purpose

The purpose of this study was to describe the cannulation experiences of HD nurses, with a particular interest in exploring the context in which nurses practise. To this end, the study will attempt to answer the following research question: What is the culture of AVF cannulation among HD nurses?

Methodology

Design

An ethnographic research design was employed, utilizing qualitative methods. Ethnography is used in the health and social sciences as a means of studying the culture of groups of people and describing and interpreting cultural patterns (Streubert Speziale & Carpenter, 2003). According to Poland,

Table 1. Interview Guide

- Can you tell me how long you have worked a) as a nurse, b) as a hemodialysis nurse, and c) in the current hemodialysis unit? Are you full-time, part-time, casual?
- 2. Can you tell me about your experience with cannulation?
- 3. Can you tell me about the nursing procedure of cannulating a dialysis access?
- 4. Can you tell me about your knowledge and beliefs pertaining to cannulation?
- 5. Can you tell me about the impact of your nursing interventions regarding patients a) having an access created, b) cannulation of the access, and c) maintaining the access?
- 6. Can you tell me what influences your decision whether to cannulate (or not) when the patient has both an AV access and a Permcath in place?
- 7. All of the questions today have asked about your experience with cannulation. Is there anything you want to say specific to your experience cannulating either fistulas or grafts?

Any other comments?

Lehoux, Holmes and Andrews (2005), "cultures involve common/shared beliefs or values at a variety of scales; cultures give meaning to ways of life and act as a lens through which we look at the world that both affects and represents our behavior; and cultures produce (and are reproduced through) material and symbolic forms" (p. 172). Of particular interest in this study is the concept of cannulation as a practice that occurs within the culture of a dialysis unit. A fundamental characteristic of ethnography is cultural immersion, whereby the researcher becomes a part of the culture through participant observation, recording of observations, and interviewing individual members of the group (Streubert Speziale & Carpenter, 2003). As a result, multiple methods including observation, in-depth interviews, and focus groups were utilized for this study.

Sample and methods

The hemodialysis unit where the research study took place cares for approximately 185 patients receiving chronic HD, provides management of acute HD for in-patients within the same hospital, and back-up services for regional satellite HD units. The hospital is located within an urban, academic health centre in Canada. At the time of the study, there were approximately 85 HD nurses working, a combination of full-time, part-time and casual hours, who were eligible to participate.

This research study received ethical approval from the local research ethics board. Consistent with an ethnographic qualitative research design, the research assistant began by participating in two observational experiences in the HD unit (Mulhall, 2003), observing cannulation by a number of different HD nurses, on different patients, and at different times throughout the day. To maintain anonymity of subjects, a research assistant with experience involving ethnographic research was hired, since the investigators (B.W. and L.H.) were employed in the HD unit where the study took place. Participant observation can contribute to a study's rigor through increased credibility (Streubert Speziale & Carpenter, 2003). Field notes were recorded immediately after each session and shared with the team for review and analysis (Emerson, Fretz, Shaw, & Thompson, 1995).

To capture thoughts of participants and the nuances of behaviours that could be missed in observation, all HD nurses working in the unit at the time of the study were invited to participate in in-depth interviews. Sample size in qualitative research is typically small and purposeful, whereby subjects are selected for the purpose of describing an experience or, in this case, a culture of which they are a part (Molzahn & Sheilds, 1997; Streubert Speziale & Carpenter, 2003). A hypothetical sample size of 15 nurses was proposed at the outset based on a broad reading of qualitative work focused on capturing practice phenomena. However, after 10 interviews, data collection was terminated, as the data appeared saturated.

Eligible participants were informed about the study by the primary investigator and a letter was provided inviting nurses to participate. HD nurses interested in participating in the study were instructed to contact the research assistant directly to arrange a time to be interviewed. Informed consent was obtained by the research assistant to participate in one 45- to 60-minute interview.

A semi-structured interview tool was used by the research assistant to guide each session (see Table 1). Each interview

took place in a private area away from the HD unit or in the participant's home—whichever was preferred by the participant. Throughout the interviews, subjects were asked for clarification regarding their comments. This reduces misinterpretation and contributes to the study's credibility (Lincoln & Guba, 1985). All interviews were audiotaped and transcribed verbatim to allow for "a faithful reproduction of the aural record" (Poland, 1995, p. 291) and, therefore, contribute to the data's rigor. In addition to the interview, nurses who participated were asked to complete a short demographic form requesting information about gender, years of experience in nursing, and years of HD experience.

Following completion of interviews and verbatim transcription, key themes were identified by the investigators, initially independently and then discussed as a group. Once there was agreement among investigators regarding the key themes, focus groups were then utilized as a means of enhancing data analysis, as preliminary findings were brought back to the HD nurses for discussion and refinement. Four focus groups, each between 45 and 60 minutes in length, were conducted over two days, and involved previous interview participants, as well as other HD nurses from the unit. In total, 31 members attended focus groups and assisted in confirming key themes from the data, consistent with their experience. Practical recommendations for improvement were also identified.

Results

All participants were female, with an average of 23.9 years (range 11 to 40 years) of nursing experience and an average of 13.3 years (range 2.5 to 39 years) of nephrology nursing experience. At the time of the HD nurses' interviews in 2009, 14% of the chronic patients in the unit were using an AVF, 85% had a CVC, and 1% had an AVG in place for HD. A comparison of vascular access prevalence data over the previous five years demonstrated an overall reduction in AVF use (21% to 14%) with an increase in CVC use (78% to 85%). There was minimal change in AVG use (2% to 1%).

Results of observational experiences demonstrated good patient engagement among HD nurses working "with" not "on" the patient being cannulated. In addition, the observational experiences demonstrated that nurses varied in their level of clinical experience and expertise with cannulation. Nurses appeared willing to help their peers when difficulties with cannulation arose within the context of the peer relationship.

A number of themes emerged from the interviews and focus groups. The overriding perceptions among all nurses were of a) the lack of fistulas; b) fistulas were a "hard sell"; c) the skill of cannulation; and d) the assembly-line approach. Issues surrounding the variation in skill level among nurses were also recognized. Environmental influences within the HD unit itself were also identified as a contributing factor affecting successful cannulation. As a result, a variety of patient, nurse and environmental factors prevented many nurses in transitioning from novices to experts, leading to what we have termed the "perpetual novice."

The lack of fistulas

The lack of AVFs being used for HD was described as a concern by all HD nurses who were interviewed, resulting in challenges to maintain competency and cannulation skills. Participants also recognized a number of patient factors con-

tributing to the lack of AVFs, including the aging HD population and associated multiple co-morbidities, including diabetes. Nurses recognized the population of patients in the HD unit included individuals who were generally too ill to do home therapy and/or receive HD at one of the outlying satellite units. Thus, what was seen in our HD unit was a cluster of older, sicker patients who were perhaps not medically suitable for AVF surgery. As one nurse summarized:

"...part of it, I think, is because the people that we have in-centre anyway, the people who are younger and probably have a fistula go out to the satellites because they are more stable and healthier. And we have the sicker, elderly patients. I'm not sure what our average age is now in the unit. It is probably 75 or higher. And, there are factors that more and more of our patients have complications or co-morbidities like diabetes. So their vessels aren't good to start with. In which case, then the chances of a fistula functioning is even less than it would have been if they were a healthy 60-year-old except for renal failure. So I think it's a combination of factors of why we don't have as many (fistulas)."

From another nurse,

"We have an awful lot of Permcaths for the number of patients we have. We just don't have enough fistulas... We have a fair number of elderly patients, or frail patients in dialysis. That might be a factor too."

There was recognition among several nurses who were interviewed that creation of an AVF may not be suitable for all patients, and that the appropriateness of referrals needs to be assessed on a case-by-case basis, "You certainly have to look at the individual to see what, you know, whether they are a good candidate for a fistula."

During the interviews, nurses acknowledged the importance of the vascular surgeon to the process of AVF creation and the need to maintain dedicated vascular surgery time and expertise. In addition, there was a perception that more could be done within the chronic kidney disease (CKD) clinics to create more fistulas prior to the initiation of HD. One nurse commented, "The problem is that once the patients get the line, they prefer the line. So, it's important to get a fistula in before they start dialysis."

Fistula as a hard sell

Hemodialysis nurses acknowledged that despite continued efforts to promote the AVF and educate patients about its benefits, convincing a patient to go for an AVF can be a hard sell, and an even harder sell in those patients with an existing CVC in place. A number of reasons for this were suggested. First, patients get accustomed to the CVC and may perceive that it is working well so, "Why go for surgery when this (the CVC) is working just fine." Or, as other HD nurses suggested, the deterrent may be the needles associated with the AVF versus no needles with the CVC. Even more significant was the impact of "waiting room chatter" on the development of patients' negative attitudes towards the AVF.

"It's a hard sell because the patients all sit out in the waiting room and talk and they hear horror stories and they are like, 'not gonna happen'. And it doesn't matter how much you talk about how much better it (the AVF) is for them, less risk of infection, all of that, they're like, 'Ya, I've heard the horror stories.' And then I see the horror stories and I find it a tough sell after 10 years. I find it a tough sell now because of the problems with cannulations."

A comment by another HD nurse about patients in the waiting room:

"I think they see the problems people have and they can hear it and it just scares them. Or, they'll talk about it in the waiting room and they just get turned off."

The outcome of the waiting room discussions and the belief among many of the HD nurses is that "nothing you can say will change their mind after that, unfortunately."

The skill of cannulation

The HD nurses who were interviewed had several years of nephrology nursing experience and they generally expressed enjoyment at cannulating fistulas. The majority viewed cannulation as something to be learned, while a few envisioned cannulation as something one was naturally or instinctively good at. Many described having good days and bad days with cannulation and, for some, there was an element of luck involved in successful skill performance.

The key notion among all HD nurses was the importance of learning and having opportunities to practise as a means to refining their skill. At the same time, there was recognition that this was becoming more difficult with the limited number of AVFs and the perception that many HD nurses have become less comfortable with cannulation over time. One participant commented: "A lot of nurses just don't feel comfortable with it (cannulation) and I think it is because they don't do it enough, because we don't have enough." With fewer opportunities to practise, there is recognition of anxiety on the part of the HD nurse to get it right:

"I think the opportunity (to cannulate) is not there. It's a big unit and then you don't have as many (fistulas), so sometimes there isn't the opportunity, and they (the nurses) are nervous because they haven't done it as often. So, it's kind of a double-edged sword in a way."

The importance of a proper assessment of the fistula at each treatment was identified as the key to successful cannulation. HD nurses described the processes of what they look for and what they feel for, as part of their assessment. The second key notion to being successful with cannulation was the need to take time in doing the assessment and in taking time, this can also help to alleviate any patient anxiety that may exist. "I get my stethoscope and listen to it. I get the ultrasound machine and look at it. I will sit down and feel with my fingers to see where it actually is before cannulating." From another HD nurse, "I just go slow and easy and just, you know, try to put them at ease... getting the arm warmed up and talking to them, and listening and feeling..." A comment from a third HD nurse:

"I always take my time and tell them at the beginning, I say, 'I only want to do this once, I don't want to keep poking you, so I'm going to take my time and choose the best possible spot and really be sure of myself before I put the needle in.' That usually calms them and then I don't feel too bad about taking time."

Participants suggested that the lack of proper assessment and failure to take time with cannulation were reasons why so many HD nurses were having problems with cannulation. A few even suggested that, for some, there was no assessment at all and that HD nurses used the needle marks from previous treatments as their landmark for insertion. Others suggested

that a lack of knowledge around how to do a proper assessment was the reason for what they were seeing in practice. One nurse commented:

"The majority of nurses, the nurses I know that work in dialysis, will use somebody else's track marks or where their last needle was put in the fistula and I think that's why some patients have a lot of problems. Because it depends on the texture of the skin that day, how much fluid they have on board, the vessels move because they are inside the body... they (the nurses) don't really know how to feel it (the AVF) and know where it is to put the needle in. I would guess at least 50% go by what spot they saw the last person using instead of doing an inspection of the vessel."

Assembly-line dialysis

Apart from issues specific to the knowledge and skills surrounding cannulation, HD nurses also identified environmental influences that can impact on their success with cannulation. Specifically, the pace of the unit during on/off procedure times and the perceived culture of the 'assembly line' during these times is a significant factor, as evidenced by the following comments, "It's like an assembly line. Get 'em on, get 'em off" or, "get 'em on, get 'em off. It's a little race." HD nurses acknowledged that pace pressures come from a variety of sources including themselves, the other HD nurses working that day, the volume and acuity of patients requiring dialysis, and the need to fit everyone in during regular work hours, as well as pressure from the patients. Another nurse commented:

"Certainly, the pace has picked up a lot (more) than it had been a few years ago. No doubt about it. And, I think, people feel pressured to keep up that pace, too. The patients, really, as much, they just want to get here, get on, get done, and get out of here... Or, you feel pressure from your co-workers."

Constraints of the system appear to play a role, as well.

"You have to do this number of patients in a day and staff only work from seven in the morning until 11 at night... and if you stayed longer, then somebody has to pay overtime and then, they say, oh well, we're over budget we'd better cut back, better cut corners, no more overtime..."

The outcome of the pace pressures is the tendency to take less time, rush, and not do a proper and meaningful assessment.

"...we're all in an assembly-line dialysis community now-adays, where it's get the patient on, get them dialyzed, get them off, and you do whatever is quickest and easiest. We don't take the time to assess the arm."

The perpetual novice

The limited number of AVFs and fewer opportunities to acquire adequate skill, combined with pace pressures that may impact on proper assessment and cannulation technique, lead to an environment whereby the new HD nurse is unable to acquire the necessary skills for cannulation. In essence, these new HD nurses become stuck, as the "perpetual novice" cannulator. The perpetual novice theme acknowledges that the transition from novice to expert cannulator, a term coined by Benner (2001), is somehow delayed or even halted altogether, despite working in the HD unit for a number of years. This can lead to wide variation in level of cannulation skill, and recognition and description of HD nurses, as either "good" or "bad" cannulators. HD nurses appear to be very aware of who is a good cannulator versus who is a bad cannulator. For the

most part, the HD nurses reported willingness to help out their peers when there were problems with cannulation and they identified the "good" cannulators as those nurses routinely asked for help.

"Well if you can't get it, then you get one of the other nurses to help. I mean, everybody knows who can cannulate and who can't. So you go find one of the good cannulators and say can you give me a hand with this?"

According to one HD nurse, the downside to being identified as an expert or "good" cannulator is the pressure to come in and make things right when problems arise.

"One thing I hate is when, if a nurse has been having problems and then she calls you in and they say, 'I'm going to get so and so because she is the expert.' Well now, that puts the patient's expectations extremely high and if that nurse has made a mess of the arm, you might not be able to get it in, even if you are a so-called expert, because you may not be able to feel it because it is so full of damaged tissue and blood that you can't find the vessel."

Participants acknowledged the added pressures that may be felt by HD nurses less comfortable with cannulation and, for some, they felt pressured by patients to be successful. For nurses transferring into HD from other hospital departments, there may be added pressure to be an expert cannulator right away. "They (the nurses) are experts in their area that they came from and they feel like they should be experts right away here." Over time, with limited opportunities to improve one's skills through practice, there may be a tendency to avoid cannulation altogether. This avoidance may be subtle or obvious.

"Some (nurses) who are not comfortable doing fistulas don't want to admit they are not comfortable doing it and... will go and do another patient who has a line or will simply ignore the patient... will look busy, so that somebody else will actually go over and put that patient on because they don't want to admit they can't do it or that they need help... why would I want to bother, I can go and do this easy one and I don't have to put any effort into it."

In the long term, the tendency to avoid cannulation creates even fewer opportunities to develop one's skill and this becomes a vicious cycle. In a busy outpatient setting, it may be easy to avoid cannulation during the day. However, there is recognition that evening on-call can or may become an issue if the HD nurse on-call is a "bad cannulator" and there is no one to help out when problems arise.

"Somebody will say, I don't do fistulas. I say, well what would you do in the middle of the night if the patient comes in and has a fistula? You can't say, I don't do fistulas. So you have to try. And I think the less they do, the less experience they have. Even if they are a rotten cannulator, they could maybe learn a bit. There are fistulas here and they do have to use them."

Discussion

Results of this study provide a starting point in examining the culture of vascular access cannulation of the AVF from the subjective experience of the HD nurse. Cannulation is an essential skill for the HD nurse, yet nurses are indicating that there are fewer and fewer opportunities to develop and/or maintain their cannulation skills. Currently, HD nurses acknowledge there is wide variation in skill level between them, so-called "good" and "bad" cannulators. Several factors,

including patient, nurse and environmental factors have contributed to what we themed "the perpetual novice" nurse; one who is unable to acquire the necessary skills to become an expert cannulator.

Benner's (2001) work on skill acquisition in nursing provides a suitable model by which to examine the development of HD nurses' clinical expertise around cannulation. The model suggests that skill development occurs on a continuum, as the learner passes through five levels of proficiency: novice, advanced beginner, competent, proficient, and expert. At one end of the spectrum, the novice has no experience to draw upon. He/she functions using a defined set of rules, protocols, and policies to guide his/her clinical practice. At the other end of the spectrum, the expert no longer relies on principles, roles and guidelines to connect his/her understanding of a situation to an appropriate action. Instead, the expert nurse uses his/her wealth of experience and intuitive grasp of each situation to guide decisions around the best action for a particular situation.

The concepts embedded in Benner's (2001) novice to expert model are widely applicable to cannulation concerns, as identified by the HD nurses who participated in our study. First, the model has applicability to both newly graduated nurses, as well as experienced nurses transferring from other clinical areas. For the latter group, Benner would argue that even experienced nurses entering a new clinical area where they have no prior clinical experience with a particular patient population may be limited to novice level of performance if the goals and tools of patient care are unfamiliar to them. Thus, according to Benner (2001), one cannot expect an expert nurse in one clinical area (e.g., critical care) who transfers to HD to be an expert cannulator right away.

The second important concept inherent in Benner's model (2001) is the suggestion as to how individuals learn, and this has implications for HD nurse orientation and staff development programs. Benner proposes that learning is an active process that occurs as a result of exposure to actual clinical situations. From a cannulation perspective, the model would, therefore, support HD nurses' views that they need more opportunities to perform the skill and it is through these opportunities that proficiency and expertise will develop. The model also acknowledges that individuals learn differently, depending on their stage in the novice to expert continuum. The novice, for example, must first learn the policies and procedures around the skill in question while learning becomes more and more abstract, as one proceeds further along the continuum towards the expert level. This has implications for nephrology educators and/or nurse mentors providing instruction and mentoring around cannulation and should guide decisions around what and how the information is provided during initial orientation for new staff and ongoing education for those with more experience.

The challenge in developing any orientation and/or continuing education plan is the need for creative solutions that allow for variation in skill level between learners. Hayes (1998) reported on her experience with the development and implementation of a structured cannulation program in the U.K. The program consists of three components: a) an access scoring system that rates the ease or difficulty in cannulating a particular AVF; 2) a formalized documentation system for com-

municating access issues; and 3) a structured staff cannulation training program that recognizes three competency levels of learners; level 1 (learner), level 2 (established) and level 3 (experienced). Outcomes of the implementation have included positive reports by all staff, improved documentation, a greater liaison with nephrologists and vascular surgeons, and fewer reported access complications.

Apart from examining how best to improve learning opportunities for HD nurses, results from this study also highlight the need to look at ways to improve the culture of the HD unit, as it relates to cannulation. While all acknowledged the need to slow down and take time, there seemed to be more value placed on completing the task in the shortest amount of time so as not to get behind and keep other patients and colleagues waiting. In this case, looking at alternative ways to schedule the on/off times for those with AVFs might be considered. This also requires HD nurses to be more considerate in allowing others sufficient time to complete their assessment and cannulation.

The notion of culture change applies to HD nurses' attitudes, as well. Further exploration of comments like, "I don't do fistulas" needs to occur in an effort to determine the attitudes and experiences behind this type of statement. The organization should provide HD nurses with adequate education and experiential opportunities, and this has been identified by participants as an area for improvement. At the same time, it is also important to acknowledge that, as professionals, HD nurses need to demonstrate accountability in identifying their own knowledge deficits and seek out learning opportunities within the clinical setting. Opportunities to continue learning in a non-threatening environment may contribute to less avoidance. A change in the cannulation experience over time from negative to positive may help to create a more positive culture in the HD unit. In the long term, this may result in less 'waiting room chatter' and, ultimately, an increase in the number of AVFs as vascular access for HD.

Limitations

This study provides an early look at cannulation of AVFs from the perspective of the HD nurse using a qualitative methodology. Due to the small sample size (n=10), generalizations cannot be assumed to be representative of all nephrology nurses performing AVF cannulations. As well, the majority of those inteviewed had been working in HD for some time and all of them interviewed indicated that they liked to cannulate. The conclusions drawn from this study may have been different if more junior HD nurses with less nursing experience, and/or nurses with a dislike for cannulation participated in the study.

A second limitation of this study relates to the context within which this study took place. The HD unit of study is located in a large tertiary care centre in Canada managing a sizable chronic outpatient population. The majority of chronic HD patients we service are older adults with multiple co-morbidities, and may not be representative of other units providing outpatient HD services.

An additional contextual factor to consider as a limitation for this study was the environmental climate of the HD unit at the time the interviews took place. In-services for HD nurs-

es specific to giving and receiving feedback in the workplace had been organized by nursing leadership and had taken place just prior to the cannulation interviews. It is likely that there was heightened awareness of the need for appropriate interpersonal communications between staff and this may be reflective of how HD nurses responded to questions about their peers during the interviews.

Implications for practice

The results of this study have a number of implications for nephrology nursing practice. At the unit level, participants we interviewed identified a number of strategies aimed at improving cannulation skills. First, HD nurses verbalized the need for standardized orientation on cannulation procedures with an expert cannulator providing cannulation education. This might mean that the individual providing orientation for cannulation may not be the same individual providing the remainder of orientation related to other HD skills. Formalized follow-up with each new HD nurse once orientation is complete was suggested as a means to identifying continued learning needs. Formal evaluation of the orientation process, as a whole, was also recognized as valuable. Nurses reported great value in ongoing education regarding cannulation and suggested such strategies as an anatomically correct practice arm, inservices on vascular anatomy and physiology and AVF assessment, as well as a photo gallery with pictures of various AVFs. A mentoring system was also recommended, pairing a novice with expert cannulator, as designated "cannulators" for a period of time. In addition, floating to other units within the region where there are a higher number of AVFs was also suggested, as a means to gain more hands-on experience.

The need for improved documentation systems was also recommended by participants. While vascular access documentation systems are already in place, the HD nurses we interviewed verbalized variability in what was documented and the level of detail that was recorded. Greater attention to detail with respect to what was effective for a particular treatment and/or problems that were encountered during cannulation would be valuable for those providing subsequent treatments for the patient with an AVF. This strategy may promote greater success for the HD nurse with subsequent cannulations while, at the same time, facilitating greater patient confidence that the nurse will be successful. Furthermore, continued opportunities to be successful with cannulation may contribute to a more positive environment for HD nurses and their patients.

Last, participants were interested in continuing education related to the skill of cannulation. It was suggested that this be provided in a manner that required all HD nurses to participate, regardless of their comfort level with cannulation. In this way, they would not be expected to single themselves out as requiring assistance in order to receive it. An annual inservice was one suggestion, where participants complete a teaching module and then perform cannulations with a recognized expert on hand. All HD nurses would complete the continuing education sessions, which would serve as a refresher for all nurses, especially those who may not be utilizing best practices or who are less skilled or comfortable with cannulation.

Implications for research

The present study interviewed HD nurses, all of whom had considerable HD experience and they were asked to reflect on their attitudes and experiences regarding cannulation. Replication of this study through interviewing the most junior HD nurses (e.g., less than one year experience) may yield different results. Further research specific to needling techniques for cannulation would be helpful in determining best practice, as currently there appears to be wide variation in practices between dialysis centres. Finally, while the earlier study by Bay, Van Cleef, and Owens (1998) surveyed medical personnel and patients regarding their preferences and concerns

regarding vascular access, this study focused its attention only on the attitudes of HD nurses around cannulation. Further study of patients' attitudes towards cannulation may also be helpful in determining their concerns/perspectives.

Conclusion

This study provides valuable insight into HD nurses' experiences with cannulation and contributes to a greater understanding of the subjective nursing experience of cannulation. This information may be helpful in directing future educational, supportive and practice interventions for HD nurses.

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Effet d'un programme de gestion de la fatigue auprès des personnes hémodialysées

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Impact of a fatigue management program in patients on hemodialysis

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Abstract

The purpose of this study was to evaluate the impact of a fatigue management program on 25 hemodialysis patients regarding their level of fatigue and their rate of satisfaction towards knowledge. The study took place inside a hemodialysis unit in a health care facility located in New Brunswick. This research design was pre-experimental. The before-after design, with only one group of subjects, makes it possible to compare the level of fatigue, as well as the rate of satisfaction towards pre- and post-program knowledge. According to the results of our study, it seems that the subjects, after benefiting from a fatigue management program, managed to significantly decrease their level of fatigue and gain satisfaction related to the acquisition of knowledge. Even though our number of participants was small, our research supports the idea that a fatigue management program can meet the need of fatigue management in this population. The results of this study foresee the need to develop a fatigue management program in hemodialysis units and to evaluate its effectiveness in the medium or long term in selecting quasi-experimental studies, including a broader population of patients.

Key words: patients on hemodialysis, fatigue management, satisfaction of knowledge

Résumé

Cette étude avait pour but d'évaluer les effets d'un programme de gestion de la fatigue auprès de vingt-cinq personnes hémodialysées quant à leur niveau de fatigue et à leur satisfaction relative aux savoirs. L'étude s'est déroulée à l'intérieur d'une unité d'hémodialyse dans un établissement de santé situé au Nouveau-Brunswick. Cette recherche est de type pré-expérimental. Le devis avant-après, avec un seul groupe de sujets permet de comparer le niveau de fatigue et la satisfaction des savoirs pré et post programme. Il se dégage de notre étude qu'après avoir bénéficié d'un programme de gestion de la fatigue, les sujets ont parvenu à diminuer de manière significative leur niveau de fatigue et à retirer de la satisfaction relative à l'acquisition des savoirs. Même si notre nombre est petit, notre recherche appuie l'idée qu'un programme de gestion de la fatigue peut répondre au besoin de prise en charge de la fatigue chez cette population. Les résultats de cette étude laissent entrevoir le besoin de mettre sur pied un programme de gestion de la fatigue dans les unités d'hémodialyse et d'évaluer son efficacité à moyen et à long terme en retenant des études de type quasi expérimental incluant de larges échantillons.

Mots clés : personnes hémodialysées, gestion de la fatigue, satisfaction des savoirs

Introduction

L'insuffisance rénale chronique a affecté la santé de 286,567 canadiens entre 1998 et 2007. De ce nombre, un total de 137,742 personnes sont hémodialysées (Institut

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Soumis pour publication : Le 11 février 2010. Accepté pour publication dans sa forme révisée : Le 30 avril 2010. canadien d'information sur la santé, 2007). La fatigue représente le symptôme le plus fréquemment vécu par les personnes hémodialysées (Cho & Tsay, 2004; Su, Wu, Lee, Wang, Liu, 2009; Wilson, Malahy, Read, Scialabba, & Woodrow, 2006). Elle apparaît au début de l'insuffisance rénale et la fatigue est attribuable particulièrement au processus de la maladie chez les personnes hémodialysées (McCann & Boore, 2000). Cho et Tsay (2004) affirment que le taux élevé de fatigue et l'impact de ce symptôme sur la vie des personnes hémodialysées ont reçu une attention minimale jusqu'à ce jour, puisque très peu d'interventions ont été développées pour réduire la fatigue chez cette population. Les personnes hémodialysées peuvent apprendre comment prendre en charge la fatigue chronique et, pour y parvenir, elles doivent avoir recours à l'infirmière (Lee, Lin, Chaboyer, Chiang & Hung, 2007). Clark et Lacasse (1998) soutiennent que les personnes atteintes de fatigue s'attendent à ce que les professionnels de la santé proposent des interventions efficaces pour la diminuer. Plusieurs auteurs sont d'avis qu'il est essentiel de donner de l'information aux personnes aux prises avec des symptômes de fatigue (Chapman & Rush 2003; Kaba et al., 2007). Ces mêmes auteurs signalent que la satisfaction à l'égard de l'information donnée aux personnes demeure grandement inexplorée.

Cho et Tsay (2004) précisent que les personnes hémodialysées se sentent impuissantes face à la fatigue qui accompagne cette maladie chronique. Pratt (2002) explique que les personnes hémodialysées doivent fréquemment aller se coucher pour une durée de cinq heures suivant leurs traitements de dialyse. Pendant cette période, elles ressentent un niveau élevé de fatigue et elles n'éprouvent aucune volonté d'accomplir des tâches quotidiennes ou d'avoir des rapports sociaux. Sklar et al. (1996) et Tsay (2004) indiquent qu'un nombre élevé de personnes hémodialysées tentent de surmonter cette fatigue par l'inactivité et le sommeil. De l'avis de Heiwe, Clyne et Dahlgren (2003), l'activité physique, les périodes de repos et la conservation d'énergie représentent des interventions qui peuvent réussir à diminuer la fatigue.

L'enseignement basé sur le savoir-agir est une étape importante des soins prodigués aux personnes hémodialysées. Ces personnes doivent apprendre à faire face à différents symptômes vécus dans leur milieu naturel (Wingard, 2005). L'information qui est transmise aux personnes hémodialysées et les apprentissages qu'elles réalisent à partir de cette information font croître leur pouvoir de prendre des décisions conduisant à l'intervention (Heiwe et al., 2003; Wingard, 2005). Harwood, Locking-Cusolito, Spittal, Wilson et White (2005) sont d'avis que les personnes hémodialysées pourraient adopter de meilleurs comportements de santé si elles recevaient davantage d'information. Armistead (2005) est d'avis qu'enseigner des interventions pour diminuer la fatigue contribuerait à améliorer la satisfaction des personnes atteintes d'insuffisance rénale, à l'égard des soins qu'elles reçoivent. La satisfaction d'avoir acquis de nouveaux apprentissages amène la personne à intégrer plus facilement les interventions apprises à sa vie quotidienne (Richard & Lussier, 2005) optimisant ainsi la prise en charge et conduisant à une meilleure gestion de la fatigue. La satisfaction fait appel au contentement de la personne (Aucoin-Gallant,

1996). En cherchant à satisfaire les besoins d'apprentissage de la personne, la professionnelle de la santé, dans ce cas-ci l'infirmière, s'engage à lui donner des informations qui s'avèrent utiles, bien structurées et formulées dans un langage clair et simple et qui s'appuient sur des éléments visuels. La professionnelle de la santé se préoccupe aussi de la compréhension et de la mémorisation des informations transmises à la personne (Richard & Lussier, 2005).

Cadre de référence

Le cadre de référence retenu pour cette recherche est celui du modèle d'Orem puisque l'autogestion est une composante du concept d'autosoins. En santé rénale, l'autogestion peut signifier que la personne hémodialysée gère elle-même sa fatigue en adoptant des interventions proposées par l'infirmière pour prendre en charge cette fatigue. Afin de faciliter cette tâche, l'infirmière peut s'inspirer du modèle d'Orem pour enseigner et soutenir la personne. Dans ses écrits, Orem (2001) mentionne que l'infirmière évalue les capacités physiques et émotives d'apprentissage de la personne de même que ses besoins d'apprentissage avant de débuter l'enseignement. Elle adapte son enseignement à l'individualité de la personne, à ses besoins et à ses attentes. Elle structure son enseignement de manière à présenter l'information pertinente dans un langage connu de la personne. Elle renforcit l'information verbale en utilisant du matériel écrit ou audiovisuel. L'infirmière vérifie souvent la compréhension de la personne pour ce qui est de l'information transmise. Elle invite la personne à poser des questions ou à émettre des commentaires. L'infirmière aide la personne à acquérir des connaissances.

But de l'étude

Le but de cette étude pré-expérimentale est d'évaluer l'effet d'un programme de gestion de la fatigue auprès des personnes hémodialysées quant à leur niveau de fatigue et à leur satisfaction à l'égard de l'information donnée relative à la gestion de la fatigue.

Hypothèses de recherche

Deux hypothèses sont retenues dans le cadre de cette recherche : 1) les personnes hémodialysées ayant bénéficié d'un programme de gestion de la fatigue démontreront une diminution de leur niveau de fatigue; 2) les personnes hémodialysées ayant bénéficié d'un programme de gestion de la fatigue retireront de la satisfaction à l'égard de l'information donnée concernant la gestion de la fatigue.

Méthode

Cette recherche est de type pré-expérimental et elle offre un devis avant-après avec un groupe unique de sujets. Ce type de devis nécessite un nombre moindre de sujets mais il présente une limite soit l'absence d'un groupe de comparaison (Burns & Grove, 2009). L'étude s'est déroulée à l'intérieur d'une unité d'hémodialyse localisée dans un établissement de santé au Nouveau-Brunswick après avoir reçu l'approbation des comités d'éthique de la recherche. Cette recherche a été menée auprès de 25 sujets adultes hémodialysés. Tous les sujets connaissaient leur diagnostic d'insuffisance rénale chronique et ils étaient hémodialysés

trois fois par semaine. Tous les sujets avaient exprimé vivre le phénomène de la fatigue et ils comprenaient la langue française ou anglaise. Les sujets qui présentaient une autre maladie chronique dans laquelle la fatigue est prédominante, par exemple, la sclérose en plaques, l'insuffisance cardiaque et le cancer ainsi que ceux qui étaient amputés des membres inférieurs ont été exclus de l'étude. Tous les sujets avaient signé un formulaire de consentement libre et éclairé.

Dans cette recherche, un formulaire des données sociodémographiques et cliniques, deux instruments de mesure et un journal de bord ont été utilisés. Les deux instruments retenus sont la Piper Fatigue Scale (PFS), version française abrégée, et l'indice de satisfaction à l'égard des savoirs (ISS). La version française de la PFS abrégée a d'abord été utilisée auprès de 229 patients atteints de tumeurs cancéreuses. Cette version française de la PFS possède une bonne fidélité d'homogénéité démontrée par un alpha de Cronbach variant entre 0,85 et 0,92. La validité externe a aussi été vérifiée au moyen de deux outils, soit l'index de performance de l'Organisation Mondiale de la Santé (OMS) et l'échelle visuelle analogue (EVA). Il existe une forte corrélation entre le score de la PFS de 22 items, le score de l'OMS et le score de l'EVA (Gledhill, Rodary, Mahé & Laizet, 2002; Piper et al., 1998). La version révisée de la PFS a été utilisée auprès des personnes hémodialysées dans des études antérieures (Cho & Tsay, 2004; Tsay, 2004). À l'intérieur de notre recherche, l'échelle de la fatigue de Piper s'est dotée d'un alpha de Cronbach de 0,973 au temps 1(T1) et il a obtenu un alpha de Cronbach de 0,972 au temps 2 (T2). L'instrument de l'indice de satisfaction à l'égard des savoirs a été élaboré par Aucoin (1998) et il permet à la personne atteinte d'une maladie chronique d'indiquer son degré de satisfaction pour ce qui est des savoirs acquis. Cet instrument de mesure possède une fidélité d'homogénéité de 0,80 et une fidélité de stabilité de 0,84 (Aucoin-Gallant, 1999). L'instrument est composé de 14 énoncés et il comprend une échelle de Likert à cinq points s'échelonnant de pas du tout satisfait (1 point) à tout à fait satisfait (5 points). Dans notre étude, l'ISS a obtenu un alpha de Cronbach de 0,917 au T1 et de 0,868 au T2. Le journal de bord a été réalisé dans le but de dresser un profil symptomatique de la personne hémodialysée et d'offrir à la personne la possibilité de bien noter la mise en pratique des interventions effectuées pour gérer la fatigue.

Le programme de gestion de la fatigue destiné aux personnes hémodialysées constitue la variable indépendante de l'étude. Il a été élaboré à partir du concept d'autogestion, des principes éducatifs énoncés par Orem et des écrits de divers chercheurs qui précisent des interventions susceptibles de diminuer la fatigue. Le contenu du programme comprend deux parties. La première partie du programme de gestion de la fatigue explique le concept de la fatigue, les facteurs étiologiques et l'évaluation de la fatigue par les personnes hémodialysées. La deuxième partie du programme fait état des interventions que la personne hémodialysée peut effectuer afin de diminuer la fatigue. Cette section met en évidence la prise en charge de la fatigue par la personne hémodialysée qui effectuera diverses interventions liées à la conservation de l'énergie, aux périodes de repos, à l'observance de la diète, à la pratique régulière de l'exercice physique, à la prise efficace

des médicaments, à la gestion efficace du stress, à la relaxation et aux massages d'acupression. En somme, cette partie met en évidence comment la personne hémodialysée peut gérer efficacement la fatigue en adoptant des interventions susceptibles de diminuer la fatigue. Ce programme met l'accent sur les savoir-faire qui sont énoncés sous forme d'évaluation et d'interventions de manière à favoriser l'autogestion. Un livret présentant le contenu du programme a été élaboré et il a été présenté aux sujets dans leur langue d'usage. Le contenu du programme a été vérifié par quatre néphrologues, une infirmière ressource en néphrologie, une infirmière soignante ayant cumulé une expérience importante auprès des personnes hémodialysées et une professeure universitaire. Quelques suggestions mineures ont été recommandées et retenues. À titre d'exemple, il est conseillé de modifier la séquence de la présentation de l'ordre des interventions. Il est aussi suggéré de présenter les points d'acupression selon une appellation de nombre, en mentionnant, par exemple, le point 1 et le point 2 au lieu de retenir le nom correspondant, soit Yanglingchuan et Zusanli. De plus, la compréhension des termes utilisés dans le programme a été vérifiée par six personnes ayant subi une transplantation rénale. Ces personnes ont eu recours à l'hémodialyse dans le passé. Elles ont fait part de leur compréhension du texte contenu dans la brochure. Les six personnes ont mentionné que le texte était utile et qu'il était rédigé dans un langage connu.

Dans notre recherche, il y a deux temps d'évaluation. La première mesure (T1) a été effectuée deux semaines avant la livraison du programme et ce, durant une journée opposée au traitement d'hémodialyse de chaque sujet. L'enseignement du programme incluait quatre séances éducatives de trente minutes par semaine. Les séances éducatives se sont déroulées pendant les traitements d'hémodialyse. De plus, les membres de la famille étaient encouragés à participer à chacune des séances. Quatre semaines après la période d'expérimentation, la deuxième mesure (T2) a été effectuée une journée opposée au traitement d'hémodialyse. Le seuil de signification a été fixé à un alpha 0,05.

Résultats

Vingt cinq sujets ont pris part à l'étude et ont franchi toutes les étapes relatives à la collecte de données. De ce nombre, 56 % des sujets sont de sexe masculin. La moyenne d'âge des sujets est de 61,72 avec un écart-type de 7,174. Plus d'un tiers des sujets (40 %) possèdent un diplôme d'études postsecondaires. Près des trois quarts des sujets (72 %) sont à la retraite. Près des deux tiers des sujets (64 %) ont un revenu familial annuel inférieur à 30 000 \$. En moyenne, les sujets sont hémodialysées depuis 2,23 années. La plupart des sujets (84 %) ont une augmentation de poids entre les traitements d'hémodialyse variant entre 1 et 3,5 kilogrammes, et le gain de poids moyen obtenu est de 2,40 kilogrammes. Au tableau 1, nous constatons que pendant les journées d'hémodialyse, 56 % des sujets indiquent être beaucoup fatigués. Par contre, les journées opposées au traitement d'hémodialyse, seulement 12 % des sujets vivent beaucoup de fatigue.

Selon la première hypothèse, les sujets ayant bénéficié d'un programme de gestion de la fatigue démontrent une diminution de leur niveau de fatigue. Les résultats obtenus à l'aide de l'échelle de la fatigue démontrent que la moyenne de la fatigue globale est passée de 6,655 à 3,536. En comparant ces deux moyennes, nous avons obtenu un résultat du test t de 6,017 et une valeur p de 0,0000. Inférieur au seuil critique fixé à 5 %, la première hypothèse est acceptée. Il ressort aussi de notre étude que toutes les dimensions de l'instrument de fatigue ont nettement diminué, par exemple, la dimension comportementale a obtenu une moyenne de 7,160 en préexpérimentation et une moyenne de 3,753 en postexpérimentation. Les valeurs p se situent à 0,000 pour ce qui est de toutes les dimensions de l'échelle de la

D'après la deuxième hypothèse, les sujets ayant reçu un programme de gestion de la fatigue retirent de la satisfaction à l'égard de l'information donnée concernant la gestion de la fatigue. Dans notre recherche, la moyenne de l'indice global de satisfaction concernant les savoirs est passée de 2,271 à 4,223. En comparant ces deux moyennes, nous avons obtenu un test t de -11,280 et une valeur p de 0,000. Inférieure au seuil critique de 5 %, les chercheuses peuvent dire que la deuxième hypothèse est acceptée.

Discussion

Dans notre recherche, la moyenne d'âge des sujets est de 61,72 ans. Michaud et Loiselle (2003) expliquent que les personnes hémodialysées se retrouvent souvent dans une population vieillissante puisqu'elles présentent divers problèmes de santé, par exemple, l'hypertension et le diabète. Dans notre recherche, plus d'un tiers des sujets (40 %) hémodialysés et néo-brunswickois (N.-B.) possèdent un diplôme d'études postsecondaires. Ce pourcentage est un peu plus élevé que celui rap-

Tableau 1. Répartitions des sujets selon les caractéristiques cliniques				
Caractéristiques cliniques	Fréquence	Pourcentage		
Durée du traitement de l'hémodialyse				
Moins d'une année	5	20 %		
Entre une année et deux années	11	44 %		
Entre 2,1 années et trois années	4	16 %		
Entre 3,1 années et quatre années	3	12 %		
Plus de quatre années	2	8 %		
Gain de poids entre les dialyses				
Moins de 1 kilogramme	3	12 %		
Entre 1,0 et 2,4 kilogrammes	10	40 %		
Entre 2,5 et 3,5 kilogrammes	11	44 %		
Plus de 3,6 kilogrammes	1	4 %		
Habitude de sommeil				
Bonne	6	24 %		
Moyenne	11	44 %		
Pauvre	8	32 %		
Pratique de l'activité physique				
Aucune	6	24 %		
Moins de trois fois par semaine	12	48 %		
Trois fois par semaine et plus	7	28 %		
Niveau de fatigue durant la journée d'hémodialyse				
Peu	2	8 %		
Moyen	9	36 %		
Beaucoup	14	56 %		
Niveau de fatigue durant les journées sans traitement d'hémodialyse				
Peu	13	52 %		
Moyen	9	36 %		
Beaucoup	3	12 %		
Autres problèmes de santé				
Maladie cardiovasculaire	18	72 %		
Hypertension	14	56 %		
Diabète	11	44 %		
Maladie pulmonaire obstructive	4	16 %		
Autres : goutte, arthrite, hyperparathyroïdie, etc.	12	48 %		

Tableau 1. Répartitions des sujets selon

porté par Aucoin-Gallant et al. (2005). Dans l'étude effectuée par ces chercheurs auprès d'un même type de population situé au N.-B., 33 % des sujets possèdent un diplôme d'études postsecondaires. Wingard (2005) précise que le niveau de scolarité est un facteur important dont il faut tenir compte pour favoriser le processus d'apprentissage. Il est essentiel que l'infirmière s'adapte au niveau d'éducation de chaque personne hémodialysée en utilisant un langage connu de celle-ci afin de permettre l'acquisition de nouveaux savoirs.

La plupart des sujets de notre étude (84 %) présentent un gain de poids moyen de 2,40 kilogrammes entre les traitements d'hémodialyse. Welch, Perkins, Johnson et Kraus (2006) sont d'avis que la prise de poids entre les dialyses ne devrait pas dépasser 2 kilogrammes. Il apparaît que les sujets de notre étude éprouvent de la difficulté à obtenir le poids recherché entre leur prochaine prédialyse et leur précédente postdialyse. Welch et al. (2006) rapportent que plusieurs personnes hémodialysées éprouvent de la difficulté à suivre la limite liquidienne. Pendant les journées de dialyse, 56 % des sujets mentionnent vivre beaucoup de fatigue. Leurs résultats concernant l'intensité de la fatigue ne sont pas surprenants puisque 64 % des sujets indiquent que le traitement d'hémodialyse constitue le facteur le plus important du phénomène de la fatigue. Dans le même ordre d'idées, Tsay et Chen (2003) mentionnent que le traitement d'hémodialyse est un facteur reconnu pour aggraver le niveau de fatigue.

Les résultats obtenus dans notre recherche démontrent que le niveau de fatigue a diminué de façon significative chez les sujets après qu'ils ont bénéficié d'un programme de gestion de la fatigue. Dans le contexte de notre étude, les interventions éducatives étaient centrées sur la personne et tenaient compte des différences individuelles. De plus, l'unicité des sujets a été prise en considération puisque chaque personne apprend à son propre rythme et de manière différente. Orem (2001) est d'avis que chacun apprend de diverses façons et que l'infirmière doit s'adapter à l'âge de la personne, à son niveau d'éducation et à ses expériences antérieures. Orem ajoute que l'infirmière doit aussi considérer le contexte de chaque personne, son style de vie et sa façon de penser afin de lui transmettre des informations individualisées. La majorité des sujets posaient beaucoup de questions en ce qui concerne l'intervention relative à l'acupression et ce, dès le début de l'enseignement du programme. Ils ont fait preuve de curiosité intellectuelle à l'égard de cette intervention éducative, ce qui démontre leur désir de vouloir acquérir de nouvelles connaissances. Orem (2001) est d'avis que la personne doit être prête à vouloir apprendre et à démontrer de l'intérêt afin de pouvoir assimiler l'information donnée.

Puisque notre recherche est novatrice, il est impossible d'effectuer des comparaisons avec les résultats de d'autres études se rapportant à la même population. Effectivement, aucune étude n'a estimé l'effet d'un programme de gestion de la fatigue auprès des personnes hémodialysées. En tenant compte de notre population, les seules comparaisons que nous pouvons faire ont trait aux résultats de recherche concernant l'effet d'une intervention éducative pour ce qui

est de l'acupression. L'étude de Tsay (2004) avait pour but d'évaluer l'effet de l'acupression sur le niveau de fatigue de 106 personnes hémodialysées. Après avoir bénéficié de l'intervention relative à l'acupression, les résultats démontrent que la fatigue a diminué de manière significative chez les sujets (p = 0,003). Ces résultats vont dans le même sens que ceux obtenus dans l'étude de Cho et Tsay (2004). Ces deux auteurs ont réalisé une étude auprès de 58 personnes hémodialysées qui se plaignaient de fatigue dans le but d'évaluer l'effet de l'acupression sur le niveau de fatigue et de dépression chez les personnes hémodialysées. Les résultats démontrent que le niveau de fatigue des sujets a diminué significativement après l'intervention relative à l'acupression (p = 0,004).

Selon nos résultats de recherche, la satisfaction relative à l'information donnée concernant la gestion de la fatigue a augmenté de façon significative chez nos sujets après qu'ils ont bénéficié d'un programme de gestion de la fatigue. Il est clair que les sujets de notre étude ont retiré de la satisfaction après l'acquisition de nouveaux savoirs. Nos résultats se comparent facilement avec ceux de Aucoin-Gallant et al. (2005). Leur étude avait pour but de comparer deux méthodes d'enseignement d'un programme éducatif en prédialyse, soit l'enseignement offert à distance et celui donné en face à face, quant à l'acquisition des savoirs et à la satisfaction relative aux savoirs. Cette recherche a été réalisée auprès de 33 personnes hémodialysées. Il en ressort un niveau élevé de satisfaction chez les sujets lorsqu'ils acquièrent de nouveaux savoirs. Dans le même ordre d'idées, plusieurs auteurs sont d'avis que lorsqu'un besoin d'apprentissage est comblé, la personne ressent de la satisfaction (Chapman & Rush, 2003; Knowles, 1990; Richard & Lussier, 2005).

Cette étude permet de conclure que l'offre d'un programme de gestion de la fatigue s'avère favorable pour diminuer la fatigue et permet aux personnes hémodialysées de retirer de la satisfaction. Toutefois, cette recherche présente des limites. D'abord, la petite taille de notre échantillon pose une limite. L'échantillon de convenance apporte une seconde limite, car nous ne pouvons pas généraliser les résultats obtenus. De plus, notre étude ne comprenait aucun groupe témoin. Finalement, l'évaluation du programme de gestion de la fatigue a seulement été réalisée à court terme. En s'appuyant sur les résultats de notre recherche, nous croyons qu'il serait approprié de mettre sur pied un programme de gestion de la fatigue dans les milieux hospitaliers pour les personnes hémodialysées et pour leur famille. Un tel programme devrait être coordonné par une infirmière clinicienne spécialisée qui pourrait orienter les infirmières dans l'enseignement à offrir. À l'intérieur de la démarche de soins, l'infirmière enseignerait à la personne hémodialysée et à sa famille à évaluer le niveau de fatigue, à reconnaître les facteurs étiologiques et à mettre en route des interventions susceptibles de la diminuer. Elle offrirait à la personne hémodialysée et à sa famille un suivi d'appui à l'autogestion de la fatigue. Une autre recommandation, au point de vue de la pratique infirmière, propose que le programme de fatigue soit adapté afin de répondre aux besoins des personnes qui doivent subir la dialyse péritonéale et qui vivent aussi le phénomène de la fatigue. Sur le plan de la recherche, il serait aussi approprié de savoir si les sujets pratiquent toujours les interventions de gestion de la fatigue proposées six mois et un an après l'expérimentation. De plus, il serait novateur de mettre sur pied un programme de gestion de la fatigue à distance pour les personnes hémodialysées étant donné que de plus en plus d'unités de dialyse satellites ouvrent leurs portes dans la région du Nouveau-Brunswick et d'évaluer ses effets

sur la fatigue et la qualité de vie. Il serait intéressant de mener une recherche concernant un suivi téléphonique d'appui à l'autogestion de la fatigue auprès des personnes hémodialysées. Finalement, puisque les personnes hémodialysées de notre étude éprouvent de la difficulté à obtenir le poids recherché entre deux traitements de dialyse, il serait pertinent d'entreprendre des études concernant l'observance et l'apport des liquides auprès de cette population.

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Treatment of hyperkalemia in patients with chronic kidney disease—A focus on medications

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Objectives

After reading the article, the reader will be able to:

- Describe signs and symptoms of hyperkalemia
- Describe medical conditions associated with hyperkalemia
- Describe medications associated with hyperkalemia
- Compare and contrast currently available pharmacologic agents to treat hyperkalemia.

Introduction

Hyperkalemia is a common electrolyte abnormality characterized by elevated serum potassium. Hyperkalemia is defined as serum potassium (normal range 3.5–5.0 mmol/L) concentrations greater than 5.5 mmol/L (Nyirenda, Tang, Padfield, & Seckl, 2009). In the body, the majority (98%) of potassium is intracellular, and the remainder (2%) is extracellular, and is required for nerve conduction and muscle contraction. For this reason, extracellular potassium concentration (measurable) is tightly regulated through renal potassium excretion (Nyirenda et al., 2009; Sood, Sood, & Richardson, 2007). Up to 90% of dietary intake of potassium is excreted by the kidney. As kidney function declines, the kidney compensates and aldosterone levels increase in order to enhance potassium excretion. However, compensatory mechanisms can become overwhelmed, and lead to hyperkalemia (Sood et al., 2007).

Potassium plays a critical role in normal nerve and muscle function. Because of this role, abnormalities in serum potassium can lead to membrane excitability and significant nerve, muscle and cardiac dysfunction, including ventricular arrhythmias and sudden cardiac death (Nyirenda et al., 2009; Parham,

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Mehdirad, Biermann, & Fredman, 2006). It is estimated that between 1% and 10% of patients admitted to a hospital experience hyperkalemia, with a mortality rate of one per 1,000 (Nyirenda et al., 2009).

Diagnosis

The diagnosis of hyperkalemia is usually based on laboratory values indicative of high potassium, as patients may not present with clinical signs and symptoms. Patients generally do not exhibit symptoms until potassium concentrations are greater than 7 mmol/L (Rose, 2009). Symptoms of hyperkalemia are related to altered neuromuscular transmission and include: muscle weakness (usually starts in lower extremities and progresses to trunk and upper extremities), paraesthesias, fatigue or palpitations (Nyirenda et al., 2009; Rose, 2009). Electrocardiogram (ECG) abnormalities associated with hyperkalemia include tall peaked T waves with a shortened QT interval (Rose, 2009). This can progress to prolonged PR and QRS intervals, loss of P waves, widened QRS complexes and sine waves, and life-threatening ventricular arrhythmias such as ventricular fibrillation (Nyirenda et al., 2009; Rose, 2009). The ECG changes associated with hyperkalemia are presented in Figure 1. Many other arrhythmias can result from hyperkalemia due to interpatient variability and concomitant

Serum potassium	Typical ECG appearance	Possible ECG abnormalities	
Mild (5.5–6.5 mEq/L)	+	Peaked T waves Prolonged PR segment	
Moderate (6.5–8.0 mEq/L)	→	Loss of P wave Prolonged QRS complex ST-segment elevation Ectopic beats and escape rhythms	
Severe (>8.0 mEq/L)	~~	Progressive widening of QRS complex Sine wave Ventricular fibrillation Asystole Axis deviations Bundle branch blocks Fascicular blocks	

Figure 1: Electrocardiographic manifestations of hyperkalemia (1mEq/L = 1mmol/L)

From Emergency management and commonly encountered outpatient scenarios in patients with hyperkalemia by M.M. Sood, A.R. Sood, & R. Richardson. (2007). *Mayo Clinic Proceedings*, 82(12), 1553–1561. Reprinted with permission.

medical conditions or electrolyte disturbances. Patients with acute increases in potassium concentrations are more likely to experience ECG changes than those with chronically elevated potassium concentrations (Rose, 2009).

Pathophysiology and associated medical conditions

Major causes of hyperkalemia are listed in Table 1. Hyperkalemia results from either increased potassium release from cells (e.g., hyperglycemia or rhabdomyloysis) or reduced potassium excretion (e.g., renal failure) (Nyirenda et al., 2009; Rose, 2009). Medications are common causes of hyperkalemia (Table 1). Frequently used medications associated with hyperkalemia include: potassium supplements, angiotensin converting enzyme (ACE) inhibitors (e.g., ramipril), angiotensin receptor blockers (ARBs) (e.g., irbesartan), potassium sparing

Table 1. Causes of hyperkalemia

(Sood et al., 2007)

Factitious hyperkalemia (laboratory value higher than serum value)

- Hemolysis due to specimen handling or collection error
- Laboratory error

Increased intake of potassium

- Potassium supplements (e.g., Slow K®, K Dur®)
- Penicillin G potassium
- Nutritional supplements

Increased shift of potassium from intracellular space

- Exercise
- Tissue destruction (e.g., tumour lysis syndrome, rhabdomyolysis, trauma)
- Normal anion gap acidosis
- · Lack of insulin
- Hyperosmolality (e.g., mannitol)
- Hyperkalemic periodic paralysis
- Medications (succinylcholine, beta blockers, digoxin intoxication, intravenous amino acids)

Impaired renal potassium excretion

- Decreased flow (e.g., from decreased effective circulating volume, chronic or acute renal failure, nonsteroidal anti-inflammatories)
- Hypoaldosteronism
- Primary adrenal insufficiency
- Medications (e.g., spironolactone, triamterene, amiloride, ACE inhibitors, ARBs, trimethoprim, pentamidine, cyclosporine, tacrolimus, heparin)
- · Primary renin insufficiency
- Pseudohypoaldosteronism
- · Distal renal tubular acidosis
- Congenital adrenal hyperplasia
- Interstitial renal disease

Unknown mechanism

 Herbal medicines (e.g., alfalfa, dandelion, noni juice, horsetail, milkweed, thistle)

ACE = angiotensin-converting enzyme;

ARB = angiotensin receptor blocker.

diuretics (e.g., amiloride), aldosterone antagonists (e.g., spironolactone), non-steroidal anti-inflammatories (e.g., ibuprofen, naproxen) and herbal supplements (e.g., alfalfa) (Sood et al., 2007). As patients with CKD frequently take ACE inhibitors or ARBs for the treatment of renal or cardio-vascular disease, these medications often cause hyperkalemia in patients with CKD. Hyperkalemia associated with ACE inhibitors is rarely reported in patients with normal renal function and is most common in patients with underlying renal impairment (Sood et al., 2007). Many common foods and salt substitutes are associated with hyperkalemia (Table 2). Renal dietitians play a key role in assisting patients with making lower potassium food choices.

Treatment

Treatment of hyperkalemia includes preventing serious complications of hyperkalemia, restoring potassium balance, and removing or correcting the underlying cause (Nyirenda et al., 2009). Strategies to treat hyperkalemia involve stabilizing the cardiac membrane from the actions of potassium, shifting extracellular potassium into cells and removing potassium from the body (Rose, 2009). Pharmacotherapeutic options for the treatment of hyperkalemia are reviewed in Table 3.

Due to the potential for life-threatening arrhythmias, which are often unpredictable, prompt assessment and treatment of hyperkalemia is necessary. First, pseudohyperkalemia (or factitious hyperkalemia) should be excluded. The most common cause of pseudohyperkalemia is a hemolysed sample (Nyirenda et al., 2009; Sood et al., 2007). If serum potassium concentrations are greater than or equal to 6.0 mmol/L with ECG changes suggestive of hyperkalemia, or greater than 6.5 mmol/L (regardless of ECG changes), immediate treatment is required (Nyirenda et al., 2009; Rose, 2009). It has also been suggested that individuals without ECG changes, but at high risk for developing arrhythmias (such as those with a rapidly increasing serum potassium concentration or with other electrolyte disturbances) may benefit from intravenous calcium (Sood et al., 2007). In scenarios where

Table 2. High-potassium foods

(National Kidney Foundation, 2010)

- Salt substitutes and salt free broth
- · Yogurt, milk
- Molasses
- Seaweed
- Chocolate
- Bran cereal, wheat germ, granola
- Vegetables (acorn squash, artichoke, bamboo shoots, beets, broccoli, brussel sprouts, Chinese cabbage, carrots, greens (except kale), kohlrabi, mushrooms (canned), parsnips, potatoes, pumpkin, rutabagas, spinach, tomatoes, vegetable juices)
- Dried fruit (apricot, dates, figs, raisins, prunes)
- Nuts and seeds, (peanut butter)
- Dried peas and beans (lima beans, black beans, refried beans, lentils, legumes)
- Fruit and juice (apricot, avocado, banana, cantaloupe, grapefruit, honeydew, kiwi fruit, mango, nectarine, orange, papaya, pomegranate, prune)

Table 3. Pharmacotherapy for hyperkalemia				
Drug class (example dose and route)*	Advantages	Administration Onset and Duration Adverse effects		
Calcium Calcium gluconate 500–1000 mg (5–10 mL of 10% solution) IV over 3–5 minutes with cardiac monitoring May repeat after 5 minutes if ECG changes persist	- only indicated for hyperkalemia with significant ECG findings (i.e., not peaked T waves alone) - effective for emergency management of severe hyperkalemia - rapid onset (immediate) - antagonizes cardiac membrane effects of hyperkalemia -effective when patient is normocalcemic	- requires intravenous administration through a central line (calcium chloride) - rapid onset (1–5 minutes) with short duration (30–60 minutes) - requires constant ECG monitoring - irritating to veins; extravasation can cause tissue necrosis - also requires administration of other agents to shift potassium into cells and remove potassium - cannot be given with bicarbonate containing solutions (precipitates) - calcium can exacerbate digoxin toxicity		
Insulin and glucose (e.g., 10–20 units Humulin R with 50 mL of 50% glucose IV over 5 minutes) Use both if glucose normalor mildly elevated, insulin alone if patient already hyperglycaemic	- effective for emergency management of severe hyperkalemia - onset within 15 minutes - pushes potassium into cells - decrease in serum potassium concentration of 1 mEq/L within 60 minutes has been reported in dialysis patients	- requires intravenous administration - onset within 15–20 minutes (peak 30–60 minutes) with short duration – lasts for up to 6 hours - can lead to hypoglycaemia – requires blood glucose monitoring every 20 minutes - also requires administration of other agents to remove potassium		
Beta agonists Salbutamol 10–20 mg in 4 mL saline via nebulizer	- effective for emergency management of severe hyperkalemia - pushes potassium into cells - decrease in serum potassium concentration of 0.6–1.0 mEq/L for 10–20 mg, respectively within 2 hours has been reported in dialysis patients	- may require intravenous administration - onset 1–2 minutes, peak 40–80 minutes, duration 4–6 hours - may lead to rebound hyperkalemia after dialysis - potential for tachycardia, tremor, flushing, anxiety - may precipitate angina or trigger arrhythmias; avoid with coronary artery disease and caution with end stage renal disease - also requires administration of other agents to remove potassium		
Diuretics Furosemide 20–240 mg IV (but higher doses required for CKD) oral or IV	- effective for longer term management of hyperkalemia - can administer via oral route - removes potassium from the body through urinary excretion	- individuals with persistent hyperkalemia (CKD) will not likely respond to diuretics - fluid losses must be monitored		
Potassium binding resins Sodium polystyrene sulfonate (Kayexalate*) Calcium polystyrene sulfonate (Resonium*) Oral or rectal route (e.g., 15–30 grams po can be repeated every 4–6 hours or 50 g mixed with 150 mL tap water as an enema)	- may be effective for longer term management of hyperkalemia - can administer via oral route - removes potassium from the body through fecal elimination	- onset 1–2 hours – duration 4–6 hours - potential exacerbation of edema due to sodium retention with sodium polystyrene sulfonate - potential for hypercalcemia with calcium polystyrene sulfonate - potential for constipation - potential for diarrhoea or colonic necrosis with sorbitol		

CKD = chronic kidney disease; ECG = electrocardiogram (Nyirenda et al., 2009; Rose, 2009; Sood et al., 2007; Allon, Dunlay & Copkney, 1989; Parham, Mehdirad, Biermann & Fredman, 2006)

^{*} for complete dosing information or parenteral products, please refer to your institutional parenteral therapy manual

hyperkalemia is suspected, such as a cardiac arrest in a patient receiving dialysis, or if an ECG suggested hyperkalemia, it may be appropriate to initiate therapy while waiting for laboratory results to confirm the diagnosis (Nyirenda et al., 2009).

The first step in the emergency treatment of hyperkalemia is the administration of intravenous calcium, which stabilizes the cardiac membrane and reduces susceptibility to arrhythmias. The second step includes therapies that shift extracellular potassium into cells, such as insulin and glucose or salbutamol. Sodium bicarbonate is an alternative agent that is useful if patients have hyperkalemia and acidemia. However, due to uncertain benefit, sodium bicarbonate is not routinely used for treatment of hyperkalemia. Emergency treatments of hyperkalemia such as intravenous calcium, insulin and glucose or salbutamol act relatively quickly. Patients require frequent monitoring of ECG effects and other laboratory tests (especially serum potassium and glucose) after they have received these therapies (Sood et al., 2007).

Calcium, salbutamol and insulin do not remove potassium from the body and generally only act for several hours, so strategies to remove potassium from the body are also employed. For the treatment of severe hyperkalemia, volume resuscitation with normal saline may be indicated and, if urine output is present, a diuretic may be indicated in order to remove potassium (Sood et al., 2007). Dialysis is a very effective therapy for hyperkalemia; for patients with serum potassium greater than 6.5 mmol/L without ECG changes normally treated with hemodialysis, dialysis should be initiated. Hemodialysis is also used if the patient has acute hyperkalemia and if pharmacotherapy fails, or if the patient has significant tissue breakdown and large amounts of intracellular potassium is released (Rose, 2009). For every hour of hemodialysis, the serum potassium can decrease by 1.0 mmol/L to 1.5 mmol/L (Blumberg, Weidmann, Shaw, & Gnadinger, 1988).

Potassium binding resins remove potassium from the body, but have a slow onset of action, and are therefore not used alone for the emergency treatment of hyperkalemia (McGowan, Saha, Chu, Resnick, & Moss, 2009). These medications are useful in mild to moderate hyperkalemia, or in the treatment of severe hyperkalemia only after the shorteracting agents have been used. Potassium binding resins are also very commonly used in the event of missed dialysis for patients receiving dialysis, or in patients with chronically elevated potassium due to ongoing CKD and concurrent use of ACE inhibitors or ARBs. Chronic use of resins is not ideal, as patients often complain of tolerability and/or palatability. Sodium polystyrene sulfonate (Kayexalate®) is most commonly used, although an alternate agent, calcium polystyrene sulfonate (Resonium Calcium®) is also available in Canada. Unlike sodium polystyrene sulfonate, calcium polystyrene sulfonate does not provide a sodium load and therefore, does not worsen edema. Patients are usually instructed to mix the powdered potassium binding resin with water or low-potassium juice such as cranberry juice to administer orally. However, these medications may also be administered rectally. The oral route is more effective due to a longer transit time (Sood et al., 2007).

The routine use of potassium binding resins in combination with osmotic laxatives has been called into question due to concerns about safety and efficacy (Kamel & Wei, 2003; McGowan, et al, 2009; Sterns, Rojas, Bernstein, & Chennupati, 2010). The efficacy of these agents to lower serum potassium has even been questioned, as there are very few studies that demonstrate any beneficial effect (Sterns et al., 2010). A study that compared placebo to sodium polystyrene sulfonate alone and with sorbitol in six dialysis patients with normal and mildly elevated serum potassium concentrations found no effect on serum potassium 12 hours after 30 g sodium polystyrene sulfonate, 30 g of sodium polystyrene sulfonate with 60 g of sorbitol or 60 g of sorbitol alone (Gruy-Kapral et al., 1998). However, a single centre retrospective study of 30 patients (50% with creatinine clearance < 30 mL/min) demonstrated an average decrease of 0.99 mmol/L (from 5.63 mmol/L to 4.64 mmol/L standard deviation 0.64 mmol/L) with a 30 g dose of sodium polystyrene sulfonate. The same authors conducted a prospective study of 24 patients, with an average serum potassium decrease of 1.01 mmol/L (from 5.69 mmol/L to 4.68 mmol/L standard deviation 0.67 mmol/L) with 30 g of sodium polystyrene sulfonate (Mikrut & Brockmiller-Sell, 2004).

Adverse effects of the binding resins can include constipation and even fecal impaction. Historically, in order to overcome this potential problem (and to hasten the removal of potassium from the gut), the potassium binding resins were administered with osmotic laxatives such as sorbitol or lactulose. There is a commercially available product that combines sodium polystyrene sulfonate with sorbitol in a suspension (Sterns et al., 2010). However, there is no published evidence that the addition of sorbitol to sodium polystyrene sulfonate improves efficacy in reducing serum potassium (Kamel & Wei, 2003; Sterns et al., 2010). Recently, cases of the serious and potentially fatal adverse effect of colonic necrosis associated with the co-administration of sodium polystyrene sulfonate with sorbitol have caused the Food and Drug Administration to issue a warning advising against the practice of concomitant sorbitol administration (McGowan et al., 2009; Sterns et al., 2010). It is estimated that the incidence of intestinal necrosis and bowel perforation is 0.27% to 1.8% among patients who receive enemas of sodium polystyrene sulfonate (Rogers & Li, 2001). However, the true incidence is unknown. The mechanism of this adverse effect is felt to be related to direct damage to the intestinal mucosa by sorbitol with resulting vasospasm and inflammation (McGowan et al., 2009). Other adverse effects of sodium polystyrene sulfonate in sorbitol include mucosal lesions in the gastrointestinal tract, fatal chemical pneumonitis and rectal stenosis (Sterns et al., 2010). The combination of sodium polystyrene sulfonate with sorbitol should be avoided (McGowan et al., 2009; Sterns et al., 2010).

Other important aspects to the treatment of hyperkalemia include: nutritional counselling, a careful evaluation of foods and medications—especially potassium supplements, e.g., Slow K*, K Dur* or any potassium containing salts (salt substitutes). Non-potassium-sparing diuretics such as furosemide could be considered (McFarlane & Culleton, 2008).

Monitoring and prevention

Careful cardiac monitoring and repeated ECG studies are essential to the emergency management of severe hyper-kalemia. Serum potassium should be repeated to determine the response to therapy. Patients with hyperkalemia also require frequent monitoring for resolution of signs and symptoms, and for adverse effects of therapy. The frequency of monitoring depends on the severity of the hyperkalemia.

Strategies to avoid hyperkalemia include working closely with a renal dietitian in order to avoid high-potassium foods, carefully monitoring or avoiding medications known to cause hyperkalemia where possible and minimizing fasting where possible (Rose, 2009).

Patients can be instructed to be aware of their serum potassium concentrations. The National Kidney Foundation instructs patients that concentrations of serum potassium of 3.5 mmol/L to 5.0 mmol/L are safe, to be cautious about serum potassium concentrations between 5.1 mmol/L to 6.0 mmol/L

and that serum potassium concentrations greater than 6 mmol/L are dangerous (National Kidney Foundation, 2010).

Implications for practice

Patients with CKD experience electrolyte disturbances, including hyperkalemia, frequently. The consequences of hyperkalemia can be severe, and even life threatening.

The process of preventing and managing hyperkalemia requires a multidisciplinary approach. This requires reducing high-potassium foods and medications that cause hyperkalemia where possible, and assessing and treating hyperkalemia based on the severity of the laboratory abnormality and ECG abnormalities immediately. Members of the renal health team, including nephrologists, nurses, dietitians, pharmacists, social workers, occupational therapists and physiotherapists can work together in order to provide patients with the education and comprehensive team-based care required to manage hyperkalemia.

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Please send all submissions, questions or comments to:

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Treatment of hyperkalemia in patients with chronic kidney disease—A focus on medications

By Colette B. Raymond, PharmD, MSc, Amy R. Sood, PharmD, and Lori D. Wazny, PharmD

- 1. Symptoms of hyperkalemia include which of the following:
 - (a) muscle weakness
 - (b) paraesthesias
 - (c) palpitations
 - (d) all of the above
- 2. Peaked T waves on electrocardiogram (ECG) are associated with hyperkalemia.
 - (a) True
 - (b) False
- 3. Patients with acute increases in serum potassium are more likely to experience ECG changes than patients with chronically elevated serum potassium concentrations.
 - (a) True
 - (b) False
- 4. Hyperkalemia associated with angiotensin converting enzyme (ACE) inhibitors is most common in patients with:
 - (a) normal renal function
 - (b) impaired renal function
 - (c) diabetes mellitus
 - (d) hypothyroidism

- 5. Other medications associated with hyperkalemia include:
 - (a) angiotensin receptor blockers
 - (b) non-steroidal antiinflammatories
 - (c) potassium sparing diuretics
 - (d) all of the above
- 6. Sodium polystyrene sulfonate (Kayexalate) powder may be mixed with which of the following juices:
 - (a) orange juice
 - (b) cranberry juice
 - (c) apple juice
 - (d) mango juice
- 7. The only route of administration that should be used for insulin administration in hyperkalemia is:
 - (a) intradermal
 - (b) subcutaneous
 - (c) intravenously
 - (d) inhaled

Case 1

A 65-year-old woman had just been admitted to hospital with acute renal failure. The medical resident states that her serum potassium is 6.8 mmol/L and an ECG showed peaked T-waves and

QRS prolongation. Hemodialysis has been ordered, but the medical resident wants to know how to stabilize the patient in the meantime.

Questions 8 to 10 refer to this case.

- 8. Which of the following medications should be given first?
 - (a) calcium gluconate
 - (b) salbutamol
 - (c) furosemide
 - (d) sodium polystyrene sulfonate
- 9. Which of the following medications work to lower serum potassium by pushing the potassium into cells?
 - (a) calcium gluconate
 - (b) insulin
 - (c) furosemide
 - (d) sodium polystyrene sulfonate
- 10. For every hour of hemodialysis, the serum potassium concentration can decrease by:
 - (a) 1-1.5 mmol/L
 - (b) 2-2.5 mmol/L
 - (c) 3-3.5 mmol/L
 - (d) 4-4.5 mmol/L

CONTINUING EDUCATION STUDY Answer Form

CE: 2.0 hrs continuing education

Treatment of hyperkalemia in patients with chronic kidney disease—A focus on medications

Volume 20, Number 3

By Colette B. Raymond, PharmD, MSc, Amy R. Sood, PharmD, and Lori D. Wazny, PharmD

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10. a

Guiding decisions about end-of-life care: Navigating the nursing role

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In June of 2009, the College of Nurses of Ontario (CNO) released the practice guideline: Guiding Decisions About End-of-Life Care replacing the Resuscitation, 1999 practice standard (available at www.cno.org/docs/prac/ 43001_Resuscitation.pdf). The 2009 guideline helps nurses understand their roles and responsibilities when providing end-of-life care (EOL), and assists them in making safe clinical decisions. The guideline outlines "key concepts" that can assist nurses in supporting patients/families in the decision-making process and in communicating their wishes about treatment such as resuscitation and other end-of-life care issues. It is applicable to nurses across all settings. The CNO suggests that nurses use this guideline in conjunction with other CNO standards or guidelines such as Consent, Ethics, Therapeutic Nurse-Client Relationship (College of Nurses of Ontario, 2009), as well as other policies and procedures in their work place. This paper uses a case study to illustrate how the guideline might apply to nephrology nurses.

Four main principles are highlighted in the guideline. They include: 1) providing clients with support at the end of their lives or in making decisions about end-of-life care in any practice setting; 2) supporting informed discussions about care goals and treatment options by facilitating communication with clients and members of the interprofessional team; 3) contributing to client well-being and acting in the best interest of the client by facilitating the implementation of the client's wishes about treatment and end-of-life care; and 4) knowing and understanding current legislation relevant to treatment and endof-life care.

Case: Ms. Peterson is an 87-year-old female on long-standing hemodialysis who was admitted to hospital due to escalating right upper quadrant abdominal pain radiating to her back. She was found to have gallbladder stones on imaging. Her comorbidities included: congestive heart failure, Grade 3-4 left ventricular function, myocardial infarction, below-knee

amputation of the right leg, and peripheral vascular disease. The patient was seen by the general surgery team who felt that surgery would be too great a risk. The family was devastated with this news. The team proposed a palliative or comfort approach to care, which would include stopping dialysis and establishing a Do Not Resuscitate (DNR) order. The family felt they needed more time to consider these issues. Several days later, the family came in to visit and found Ms. Peterson had deteriorated with a fluctuating level of awareness. The nurse was called to assess the patient and, upon completing her assessment and finding the patient comfortable, informed the family that a DNR order had been placed on the patient's chart and a comfort approach to care was being taken. On further discussion with the daughter, the nurse learned that the patient had expressed a wish for "everything possible to be done" prior to her coming into hospital. The patient's daughter then asked "What will happen to my mother now? We are not ready for her to die." As the nurse caring for this patient, how would you respond?

- a) "The decision for DNR has already been made by the team and we have been keeping your mother comfortable."
- b) "I don't know—this is my first time caring for your mother; this is how she has been during my shift. You will need to speak to the doctor."
- c) "Can you tell me more about your mother's wishes and your concerns so that I may communicate them to the team?"

By Kalli Stilos, RN, MScN, CHPCN(C) and Patricia Daines, RN, MN, CHPCN(C)

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Department Editor: Eleanor Ravenscroft, RN, PhD, CNeph(C).

The CNO (2009) guideline focuses on two key concepts: *communication* and *implementation*.

- Communication is defined as "Nurses communicate with clients and members of the interprofessional team to guide informed discussion about the goals of care and treatment" (p. 5).
- Implementation is defined as "Nurses advocate for the client and help implement the client's treatment and end-of-life care wishes" (p. 6).

Under each of these key concepts, the guideline highlights examples of nursing actions

As health care providers at the front lines of patient care, nurses represent the larger part of the health care team when communicating with patients and families. As illustrated in the above case, nurses often find themselves in the midst of families' questions and concerns regarding the families' loved ones' care. While nurses may not always have the answers to questions raised by families, this CNO guideline states that

nurses have a duty to explore these concerns and communicate them to the interprofessional team.

In the above-mentioned case, the nurse provided the daughter the opportunity to share the patient's perspective and identify her mother's goals of care. The nurse felt that the daughter had a good understanding of her mother's current status. On reviewing the patient's chart, however, the nurse noted no documentation of DNR status discussion. The nurse informed the daughter of this and contacted the on-call physician to involve her in the discussion of clarifying the end-of-life care wishes. The physician stated that her impression after the recent family meeting was that code status was DNR. She offered to come to the ward and respond to the daughter's concerns.

As part of her role, the nurse reviewed the patient's goals of care with the daughter and the physician, facilitating ongoing communication about the end-of-life care plan. Once the goals of care were clarified (DNR, continuing dialysis for now, assess and manage symptoms of discomfort), the nurse documented the discussion so that all would be informed.

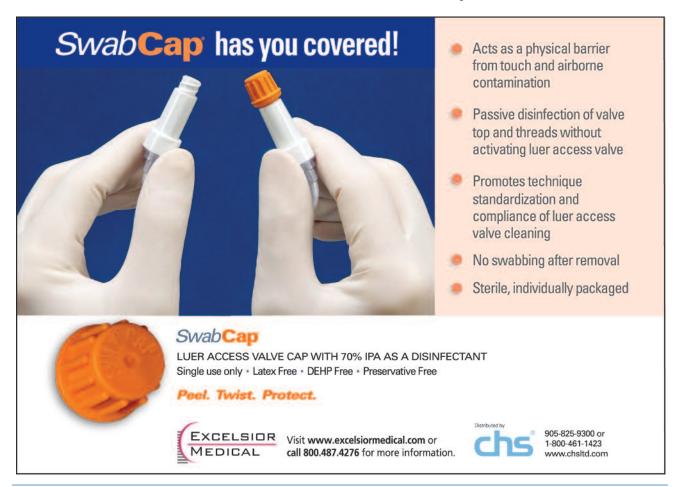
Regardless of the setting, nurses need to strive to achieve an understanding of specific end-of-life care issues from the perspective of each patient or family in order to promote the highest quality of care. It is important that nurses keep abreast of practice standards and guidelines provided by their governing province, as they are the overarching structure for nursing Enhancing one's knowledge, skills, judgment, and attitudes through the use of practice standards and guidelines leads to continued improvement in competency and safe clinical practice.

Correct answer for above multiple-choice question is: C

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Bedside Matters...

The days of our lives

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Valentine

It has been seven years Since we prepared your wife For your imminent demise

She seemed so unaware We were so sure

A shift passed Very little changed 12 hours more The same

One more shift, The tide had turned

You asked about your daughter Heard she'd called After all these years

Seven Februarys later You're calling to remind me We celebrate the anniversary again. Miracles do happen.

Cafeteria Survival

Lunch break time scheduled like another job to be done thirty minutes your co-worker is waiting hurry off.... rush to line up the food search... find someone you know in the sea of faces munching strangers and employees everywhere twenty minutes remain converse noise rumbles in your head deep breath in... try to blow it away rush five minutes left if only... you could close your eyes for a moment of peace quiet to gather strength for the rest of the day.



The Jewelry Box

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By Lee Beliveau, RN, CNeph(C), staff nurse, hemodialysis unit, at Surrey Hospital, Surrey, British Columbia

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

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

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

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Gastrointestinal

The safety and efficacy of RENAGEL in patients with dysphagia, swallowing disorders, severe gastrointestinal (GI) motility disorders, or major GI tract surgery have not been established. Caution should be exercised when RENAGEL is used in patients with these GI disorders.

Pregnant Women: The safety of RENAGEL has not been established in pregnant women. In preclinical studies, there was no evidence that RENAGEL induced embryolethality, fetotoxicity or teratogenicity at the doses tested (up to 1 g/kg/day in rabbits; up to 4.5 g/kg/day in rats). RENAGEL should only be given to pregnant women if the benefits outweigh the risks.

Nursing Women: There have been no adequate, well-controlled studies in lactating, or nursing women.

Pediatrics: The safety and efficacy of RENAGEL has not been established in pediatric patients. The minimum age of patients treated with RENAGEL in clinical trials was 18 years old.

Geriatrics: No special considerations are needed for elderly patients.

Monitoring and Laboratory Tests

rum phosphorus and serum calcium should be monitored every 1 to 3 weeks until the target phosphorus level is reached. The dose of RENAGEL should be adjusted based on serum phosphorus concentration and titrated to a target serum phosphorus of .≤ 1.8 mmol/L.

RENAGEL does not contain calcium or alkali supplementation; serum calcium, bicarbonate, and chloride levels should be monitored.

ADVERSE REACTIONS

(See Supplemental Product Information for full listing)

Clinical Trial Adverse Drug Reactions
In a combined safety database comprised of 483 patients with end-stage renal disease undergoing hemodialysis, the most common adverse events were nausea (25.3%), vomiting (24.4%), diarrhea (21.2%), headache (18.4%), dyspepsia (15.7%) and dyspnea (15.7%). From this database, the most common adverse events from a single 52-week randomized clinical study of RENAGEL vs. calcium (calcium acetate and calcium carbonate) were vomiting (22.2% vs. 21.8%), nausea (20.2% vs. 19.8%), diarrhea (19.2% vs. 22.8%), dyspepsia (16.2% vs. 6.9%) and nasopharyngitis (14.1% vs. 7.95). The adverse events are not necessarily attributed to RENAGEL treatment. The incidence of these events was

In one hundred and forty three patients with end-stage renal disease undergoing peritoneal dialysis with treatment duration of 12 weeks, adverse events reported at an incidence ≥10% were dyspepsia (17.5%), vomiting (11.3%) and peritonitis (11.3%). These adverse events are not necessarily attributed to RENAGEL treatment. The incidence of these events was not dose related.

The most frequently occurring serious adverse event with RENAGEL use was peritonitis at 8.2%, compared to 4.3% with calcium. Patients receiving dialysis are subject to certain risks for infection specific to the dialysis modality. Peritonitis is a known complication in patients receiving peritoneal dialysis (PD). Therefore, patients on PD should be closely monitored to ensure the reliable use of appropriate aseptic technique with the prompt recognition and management of any signs and symptoms associated with peritonitis.

Less common clinical trial adverse events

The following adverse events have been observed with RENAGEL use with an incidence of <10%, but greater than calcium and without attribution to causality, including: abdominal distension, constipation, diarrhea, nausea, chest pain, fatigue, pyrexia, catheter site infection anorexia, headache, cough and pruritis.

Some patients experienced adverse events related to hypercalcemia in the calcium group but not in the RENAGEL group.

Post-Market Adverse Drug Reactions

During post-marketing experience with RENAGEL, the following have been reported without attribution to causality: pruritis, rash, and

DRUG INTERACTIONS

Drug-Drug Interactions

RENAGEL (sevelamer hydrochloride) was studied in human drug-drug interaction studies with digoxin, warfarin, enalapril, metoprolol and iron. RENAGEL had no effect on the bioavailability of these medications. However, in a study of 15 healthy subjects, a co-administered single dose of 7 RENAGEL Capsules (approximately 2.8g) decreased the bioavailability of ciprofloxacin by approximately 50%. Consequently, RENAGEL should not be taken simultaneously with ciprofloxacin.

When administering any other medication where a reduction in the bioavailability of that medication would have a clinically significant effect on safety or efficacy, the physician should consider monitoring blood levels or dosing that medicine apart from RENAGEL (at least one hour before or three hours after RENAGEL). Patients taking anti-arrhythmic and anti-seizure medications were excluded from the clinical trials. Special precautions should be taken when prescribing RENAGEL to patients also taking these medications.

Drug-Food Interactions

There have been no adequate, well-controlled studies regarding the effect of a variety of foods on the intestinal phosphorus binding of RENAGEL

Drug-Herb Interactions

There have been no adequate, well-controlled studies regarding drug-herb interactions.

Drug-Laboratory Interactions

There have been no adequate, well-controlled studies regarding drug-laboratory interactions.

Drug-Lifestyle Interactions

 $\overline{\text{There}}\ \text{have}\ \overline{\text{been no adequate, well-controlled studies regarding drug-lifestyle interactions.}$

For more details on adverse events reported during clinical trials, see ADVERSE REACTIONS in the Supplemental Product Information.

To report a suspected adverse reaction, please contact Genzyme Canada by:

Toll-free telephone: 1-877-220-8918

Fax: 905-625-7811

Or by regular mail: Genzyme Canada Ltd., 2700 Matheson Blvd. East,

West Tower, Suite 800, Mississauga, Ontario L4W 4V9

♦ Administration

DOSAGE AND ADMINISTRATION

Dosing Considerations

- The tablets should not be bitten, chewed or broken apart prior to dosing.
- RENAGEL (sevelamer hydrochloride) should be taken immediately prior to or with meals, since its action is to bind ingested phosphate (see ACTION AND CLINICAL PHARMACOLOGY, Mechanism of Action in the product monograph)
- When administering any other medication where a reduction in the bioavailability of that medication would have a clinically significant effect on safety or efficacy, the physician should consider monitoring blood levels or dosing that medicine apart from RENAGEL to prevent GI binding (at least one hour before or three hours after RENAGEL).

Recommended Dose and Dosage Adjustment

The recommended dosing to be used when initiating RENAGEL in patients not using another phosphate binder are outlined below:

Starting Dose		
Initial Serum Phosphorus	RENAGEL Tablets 800 mg	
> 1.8 and < 2.4 mmol/L	3 tablets per day (2.4 grams)	
≥ 2.4 mmol/L	6 tablets per day (4.8 grams)	

When switching from calcium-based phosphate binders to RENAGEL, an equivalent starting dose on a mg/weight basis of RENAGEL should be

Dosage adjustments, when necessary should be recommended every 1 to 3 weeks by increasing one tablet per meal (3 per day) until the target serum phosphorus levels are met.

The total daily dose should be divided according to meal portions during the day.

Average Maintenance Dose: Dosage should be adjusted based upon the target serum phosphorus levels. The dose may be increased or decreased by one tablet per meal at two week intervals as necessary. The average final dose in the chronic phase of a 52 week Phase 3 clinical trial designed to lower serum phosphorous to 1.6 mmol/L or less was approximately 7.1 grams, (approximately nine 800 mg tablets per day equivalent to three 800 mg tablets per meal). The maximum average daily RENAGEL dose studied was 13 grams

If a dose is forgotten, it should be skipped. Double dosing is not advisable

STORAGE AND STABILITY

Store at controlled room temperature 15°C to 30°C. Protect from moisture.



Study Reference

Renagel® product monograph, Genzyme Canada, October 2007.

Supplemental Product Information

ADVERSE REACTIONS

Clinical Trial Adverse Drug Reactions

Because clinical trials are conducted under very specific conditions the adverse reaction rates observed in the clinical trials may not reflect the rates observed in practice and should not be compared to the rates in the clinical trials of another drug. Adverse drug reaction information from clinical trials is useful for identifying drug-related adverse events and for approximating rates.

In a combined safety database comprised of 483 patients with end-stage renal disease undergoing hemodialysis, adverse events reported at an incidence ≥ 10% are provided in Table 1 below. From this database, adverse events are also presented separately from a single long-term randomized clinical study for RENAGEL and calcium. The adverse events presented in the table below are not necessarily attributed to RENAGEL treatment. The incidence of these events

Table 1: Adverse Events in Patients with End-Stage Renal Disease undergoing Hemodialysis

	Total AEs reported	52 weeks Study of RENAGEL vs. calcium (calcium acetate and calcium carbonate)	
System Organ Class Event	RENAGEL N = 483 %	RENAGEL N = 99 %	calcium N = 101 %
Gastrointestinal Disorders			
Vomiting	24.4	22.2	21.8
Nausea	25.3	20.2	19.8
Diarrhea	21.1	19.2	22.8
Dyspepsia	15.7	16.2	6.9
Constipation	13.3	8.1	11.9
Infections and Infestations			
Nasopharyngitis	13.9	14.1	7.9
Bronchitis	5.4	11.1	12.9
Upper Respiratory Tract Infection	7.0	5.1	10.9
Musculoskeletal, Connective Tissue and Bon	Disorders		
Pain in Limb	13.7	13.1	14.9
Arthralgia	11.4	12.1	17.8
Back Pain	6.0	4.0	17.8

Table 1: Adverse Events in Patients with End-Stage Renal Disease undergoing Hemodialysis (cont'd.) Skin Disorders 9.9 13.1 10.4 Respiratory, Thoracic and Mediastinal Disorders Cough 12.9 Vascular Disorders Hypertension 9.3 10.1 5.9 **Nervous System Disorders** 18.4 9.1 15.8 General Disorders and Site Administration Disorders Dialysis Access Complication 10.9

In one hundred and forty three patients with end-stage renal disease undergoing peritoneal dialysis with treatment duration of 12 weeks, adverse events reported at an incidence ≥ 10% are provided in Table 2 below. The adverse events presented in the table below are not necessarily attributed RENAGEL treatment. The incidence of these events was not dose related.

Table 2: Adverse Events in Patients with End-Stage Renal Disease Undergoing Peritoneal Dialysis

System Organ Class Event	RENAGEL (N=97) %	calcium (N=46) %	
Gastrointestinal disorders			
Dyspepsia	17.5	8.7	
Vomiting	11.3	4.3	
Peritonitis	11.3	4.3	

Since RENAGEL (sevelamer hydrochloride) is not absorbed, the risk of systemic toxicity is minimal. RENAGEL has been given to healthy volunteers at doses up to 14 grams per day for 8 days with no adverse effects. The maximum average daily dose of RENAGEL that has been given to hemodialysis patients is 13

Full product monograph is available from : Genzyme Canada Ltd., 2700 Matheson Blvd. East, West Tower, Suite 800, Mississauga, Ontario L4W 4V9



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ON/NL: 13% HST; NS: 15% HST	☐ Master's	☐ Master's	
I enclose \$	☐ Doctorate	☐ Doctorate	
made payable to Canadian Association of Nephrology Nurses and Technologists.	Primary area of practice Progressive renal insufficiency (pre-dialysis)		
Method of payment: ☐ Cheque ☐ Money order ☐ Visa ☐ Mastercard	☐ Transplantation☐ Hemodialysis		
Cardholder Name:	☐ Peritoneal		
Cardiloidel Ivaine.	☐ Pediatrics		
Visa Number:	☐ Other (Specify)		
Expiry Date:	Datum	to CANNT	
C		to CANNT ag Address:	
Signature:			
☐ I have attained CNeph(C)/cdt designation Year of designation	Debbie Maure, CANNT, Suite #322, 336 Yonge St., Barrie, Ontario, L4N 4C8		
Professional registration #	Telephone (705) 720-2	819 Fax (705) 720-1451	
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