CANNT|ACITN
Canadian Association of Nephrology Nurses and Technologists
l'Association canadienne des infirmières et infirmiers et des technologues de néphrologie

CANNT JOURNAL
JOURNAL ACITN

Volume 28, Issue 2 April–June 2018

IN THIS ISSUE:

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APRIL–JUNE 2018 • VOLUME TWENTY-EIGHT • ISSUE TWO

CANNT JOURNAL
JOURNAL ACITN

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JOVINA BACHYNSKI

Letter from the Editor

CANNT Journal is pleased and honoured to publish the seminal work by Marticorena et al. *(Ultrasound evaluation of intraluminal needle position during hemodialysis: Incidental findings of cannulation complications)* in this edition. As most of you know, the journal only considers manuscripts for publication on the condition that they are submitted **solely** to *CANNT Journal*; upon acceptance of the submitted material, the author(s) transfer copyright ownership to *CANNT*. Furthermore, material may not be reproduced/duplicated without the written permission of *CANNT*. *CANNT Journal* is an internationally-known, peer-reviewed publication. An article of this calibre could easily have been submitted to other peer-reviewed scholarly journals, but Ms. Marticorena felt that it should rest with those individuals for whom the paper should resonate the most: those of you at the frontline who look after our patients on hemodialysis and their vascular access.

CANNT Journal is also venturing into the open-access publication option in this issue. The journal editorial board had previously reprinted an article by the International Academy of Nursing Editors (INANE) "Predatory Publishing Practices" Collaborative in *CANNT Journal* in March 2015 that raised awareness about predatory publishing practices that have flourished with open access. Under open access, restrictions to the online access of peer-reviewed scholarly research articles are removed. Journals (such as *CANNT Journal*) have historically relied on journal subscriptions and advertisements for revenue; however, there are journals that rely on a publication system that is fee-based, i.e., open access (such as the *Canadian Journal of Kidney Health and Disease*, the official journal of the Canadian Society of Nephrology). In short, in order for their research to be published rapidly and widely under this system, authors or their funders *pay a fee* to the journal. Predatory publishers may engage in the dubious practice of promising expedited review and acceptance of an article for publication or subjecting said article to minimal or non-existent review process. The outcome is erosion of the integrity of the publication. The CANNT Board of Directors has recently made a calculated decision to approve limited open access with the publication of Marticorena et al.'s research study. Manuscripts under consideration for publication in *CANNT Journal* undergo a rigorous peer review process before they are showcased, and Marticorena et al.'s offering is no different. The difference lies in the fact that, once published after this rigorous review, under this limited open access arrangement, the author will pay a fee to grant online access to said article to the public at large, thus ensuring that access to this important work is not restricted to just CANNT members.

Access to *CANNT Journal* is one of the key benefits of your CANNT membership. To all novice and seasoned authors, we are always looking for original research papers, relevant clinical articles, innovative quality improvement reports, and narratives that describe the nursing experience. I am proud to say that the editorial team at *CANNT Journal* works hard to collaborate with, and mentor and guide authors through the review process to ensure that only quality work is published, as has always been our tradition.

I am also pleased to include the CE article by Liu and Battistella on pain management in hemodialysis. Pain assessment and management will always be relevant to our collective practice. Liu and Battistella provide an excellent overview of the pharmacologic and non-pharmacologic management of nociceptive and neuropathic pain.

As has been our tradition, the second issue of the year offers the range of abstracts that will be showcased in the upcoming symposium, which will be held in Quebec City this coming October. There is a variety of topics to appeal to everyone in both French and English. Please make sure to read through these abstracts showcasing the issues that are prevalent in our practice today.

The CANNT Board of Directors in conjunction with the CANNT 2018 Planning Committee has been working furiously to ensure an exceptional symposium in Quebec City. With the beautiful and historic backdrop of Quebec City, CANNT 2018 promises to be yet another excellent event that showcases the multiple talents working in nephrology nursing and technological practice today. I look forward to meeting you at the symposium—please do not hesitate to approach me if you have any question about publishing your work in our esteemed journal. Until then, enjoy.

Sincerely,
Jovina Bachynski, MN, RN(EC), CNeph(C)
Editor, *CANNT Journal*

REFERENCE

International Academy of Nursing Editors (INANE) "Predatory Publishing Practices" Collaborative (2015). Predatory publishing: What editors need to know. *Canadian Association of Nephrology Nurses and Technologists, 25*(1), 8–10.

NOTICE BOARD

- Canadian Nurses Association (CNA) exam timeline **https://www.nurseone.ca/certification/renewing-your-certification#sthash.IDBqg5i7.dpuf**

  FALL 2018
  - **June 1–September 10, 2018**: initial exam or renewal by exam application window
  - **November 1–15, 2018**: certification exam window
  - **January 10–November 1, 2018**: application window to renew by continuous learning
- **June 18–20, 2018.** Canadian Nurses Association (CNA) Biennial Convention: *From insights to impact: It starts with nursing,* Shaw Centre, Ottawa, ON. **www.cna-aiic.ca**
- **September 15–18, 2018.** 47th Annual European Dialysis and Transplant Nurses Association/European Renal Care Association (EDTNA/ERCA) International Conference: *Global approach to renal care innovation—Balancing compassion and health technologies*, Genoa, Italy. **www.edtna-erca.com**
- **September 19, 2018.** Nephrology Health Care Professionals' Day (celebrated every third Wednesday of September annually).
- **October 25–27, 2018.** Canadian Association Nephrology Nurses and Technologists (CANNT) 50th National Symposium 2018: *Our past will guide our future/Le passé est garant de l'avenir.* Ville de Quebec City, QC. **www.cannt.ca**
- **October 23–28, 2018.** The American Society of Nephrology (ASN) 2018 Kidney Week, San Diego Convention Center, San Diego, CA. **www.asn-online.org**

Le Journal ACITN est la publication officielle de l'Association canadienne des infirmiers/infirmières et technologues en néphrologie, a/s 4 Cataraqui St., Suite 310, Kingston, ON K7K 1Z7, téléphone : (613) 507-6053, télécopieur : 1-866-303-0626, Courriel : cannt@cannt.ca. Publié quatre fois par année, ce journal est envoyé à tous les membres de l'Association. L'abonnement annuel est: Canada, 80 $ (+TVH), E.-U., 90 $, hors du Canada et E.-U., 115 $. Les publications antérieures, lorsque disponibles, coûtent 7,50 $ (+TVH) chacune. Les opinions émises par les auteurs dans ce journal ne sont pas nécessairement partagées par l'Association ni par le corédactrices en chef. Nous invitons les lecteurs à nous faire part de leurs opinions. Toute correspondance devra être envoyée à l'ACITN, 4 Cataraqui St., Suite 310, Kingston, ON K7K 1Z7.

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

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

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JOVINA BACHYNSKI

Mot de la rédactrice en chef

C'est un plaisir et un honneur pour le CANNT Journal de publier dans cette édition le travail précurseur de Marticorena et al. *(Ultrasound evaluation of intraluminal needle position during hemodialysis: Incidental findings of cannulation complications)*. Comme la plupart d'entre vous le savent, le journal envisage la publication de manuscrits à condition qu'ils aient été soumis **uniquement** au *CANNT Journal*; sur acceptation du matériel présenté, les auteurs cèdent leurs droits d'auteur au *CANNT Journal*. En outre, le matériel ne peut être reproduit sans l'autorisation écrite du *CANNT Journal*. Le *CANNT Journal* est une publication à comité de lecture de renommée mondiale. Un article de cette importance aurait aisément pu être soumis à d'autres revues savantes révisées par des pairs, mais Mme Marticorena estimait qu'il devait plutôt atteindre les personnes les plus directement concernées : ceux d'entre vous qui œuvrent en première ligne auprès de nos patients en hémodialyse et qui s'occupent de leur accès vasculaire.

Avec ce numéro, le *CANNT Journal* explore la publication en libre accès. Le comité de rédaction du journal a précédemment repris un article collectif de l'INANE (International Academy of Nursing Editors) intitulé « Predatory Publishing Practices » dans le CANNT Journal de mars 2015. Cet article attirait l'attention sur les pratiques prédatrices qui se sont répandues avec l'essor de la publication en libre accès. Dans le cadre de la publication en libre d'accès, les restrictions à l'accès en ligne aux articles de recherche à comité de lecture sont levées. Par le passé, le financement des revues professionnelles (comme le *CANNT Journal*) passait par l'abonnement et la publicité; toutefois, certaines revues fonctionnent selon un principe de publication payante, c.-à-d., en libre accès (comme le Canadian Journal of Kidney Health and Disease, la revue officielle de la Société canadienne de néphrologie). En bref, afin que leur recherche soit publiée rapidement et à grande échelle dans le cadre de ce système, les auteurs ou leurs commanditaires paient des droits à la revue spécialisée. Des éditeurs prédateurs peuvent alors se livrer à des pratiques douteuses en promettant un examen accéléré et l'acceptation d'un article à des fins de publication, ou même soumettre l'article à un processus d'examen minimal ou carrément inexistant. Il en résulte une érosion de l'intégrité de la publication. Le conseil d'administration de l'ACITN a récemment pris la décision calculée d'approuver la publication restreinte en libre accès avec la parution de l'article de recherche de Marticorena et al. Les manuscrits en cours d'évaluation en vue de leur publication dans le *CANNT Journal* sont soumis au préalable à un processus d'examen rigoureux, et l'article de Marticorena et al. ne fait pas exception à cette règle. La différence réside dans le fait qu'après publication de l'article soumis à cet examen rigoureux, en vertu de cette entente de libre accès, l'auteure paiera un droit pour accorder l'accès en ligne au grand public, afin que ce travail important ne soit pas restreint uniquement aux membres de l'ACITN.

L'accès au *CANNT Journal* est l'un des avantages clés de votre adhésion à l'ACITN. Nous invitons les auteurs novices et chevronnés à nous soumettre leurs travaux de recherche originaux, articles cliniques pertinents, rapports novateurs d'amélioration de la qualité, et récits décrivant l'expérience des soins infirmiers. Je suis très fière de l'équipe de rédaction du *CANNT Journal* qui travaille étroitement avec les auteurs pour les conseiller et les guider tout au long du processus d'examen afin de garantir que seuls les ouvrages de qualité sont publiés, comme en témoigne notre histoire.

Je suis également ravie d'inclure l'article de formation continue de Liu et Battistella sur la prise en charge de la douleur en hémodialyse. L'évaluation et la prise en charge de

la douleur seront toujours pertinentes pour notre pratique collective. Liu et Battistella nous offrent un excellent aperçu de la prise en charge pharmacologique et non pharmacologique de la douleur nociceptive et neuropathique.

Comme d'habitude, le second numéro de l'année dresse la liste des abrégés qui seront présentés dans le cadre du prochain symposium, lequel se tiendra à Québec au mois d'octobre. Une multitude de sujets pour plaire à tous les goûts et intérêts seront au programme, tant en français qu'en anglais. N'oubliez pas de lire ces abrégés pour connaître les enjeux les plus courants dans notre pratique actuelle.

Le conseil d'administration de l'ACITN et le comité de planification 2018 de l'ACITN travaillent d'arrache-pied pour présenter un symposium exceptionnel à Québec. Avec la magnifique ville chargée d'histoire qu'est Québec en toile de fond, le symposium de 2018 promet d'être un autre événement formidable qui célèbrera les multiples talents des professionnels œuvrant dans le secteur des soins infirmiers en néphrologie et dans la pratique technologique d'aujourd'hui. J'espère avoir le plaisir de vous rencontrer au symposium – n'hésitez pas à venir me voir si vous avez des questions concernant la publication de votre travail dans notre revue réputée. Au plaisir!

Cordialement,
Jovina Bachynski, MN, IA(EC), CNéph(C)
Rédactrice en chef, CANNT Journal

RÉFÉRENCE

International Academy of Nursing Editors (INANE) "Predatory Publishing Practices" Collaborative (2015). Predatory publishing: What editors need to know. *Canadian Association of Nephrology Nurses and Technologists*, 25(1), 8–10.

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President's Message

Welcome summer… finally! The hibernation is over and the stirring of rebirth is upon us. YEAH!

I had the pleasure of attending the 17th Congress of the International Society of Peritoneal Dialysis (ISPD) on May 5–8, 2018, in beautiful Vancouver, Canada. One thousand three hundred delegates from around the world were in attendance. Our CANNT Board members, Michele Trask (Communication Director), Janice MacKay (President-Elect/Treasurer), and I provided administrative support during registration. What a wonderful experience welcoming delegates from all over the world to Canada!

Vancouver was abuzz with nephrology healthcare professionals. The Canadian Society of Nephrologists (CSN), Canadian Association of Nephrology Administers (CANA), and Can-SOLVE CKD annual meetings overlapped throughout the week. This overlap made for interesting people-watching, as speakers and delegates moved from hotel to hotel in Vancouver's downtown core.

The ISPD conference focused on patient-centred care, engaging and encouraging patients and their families to participate in decision-making about their renal journey. Patients were in attendance, and presented their perspectives and ideas to improve care. After all, this is why we all do what we do! The sessions were engaging and interactive. Most were two hours long with multiple presenters and perspectives on a single topic. The "Brag and Steal" presentations, in which success stories were shared with the intent of the attendants replicating these successes in their home units, prompted amazing questions and debate.

To my PD nurse colleagues, you ROCK! Teaching the skills required to perform PD at home is key to a successful outcome. I was disappointed that this was not a factor included in research studies of the concurrent sessions I attended. I feel the skill mix, nurse-to-patient ratio, length of training, and the ease of access to follow-up support would dramatically affect not only the success of PD, but more importantly, patient satisfaction. I encourage you to participate in nurse-led research initiatives in your units that improve clinical practice and the patient experience. CANNT members would love to hear about your research through our *CANNT Journal*, posters, and presentations at our CANNT national symposia.

I will be attending the Canadian Nurses Association (CNA) Biennium on June 18–20, 2018, in Ottawa, as a voting delegate. CNA is the national professional voice representing nearly 139,000 registered nurses in Canada. A key membership decision to expand membership beyond RNs and NPs is pending. The proposed change will include licensed/registered practical nurses (LPNs/RPNs) and registered psychiatric nurses into the association. You can find out more information by checking the CNA website www.cna.aiic.ca

Preparations are underway for CANNT's 50th Anniversary Symposium (*Our Past Will Guide Our Future*) in Quebec City on October 25–27, 2018. We look forward to seeing you there.

Thank you for your ongoing support of CANNT. Thank you for the work you do each and every day to improve the lives of our patients. You are AMAZING!!

Yours in Nursing,
Heather Dean, RN, CNeph(C)
CANNT President 2016–2018

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Message de la présidente

Enfin, l'été est arrivé! Nous sortons de notre hibernation et la vie reprend son cours. Il était temps!

J'ai eu le plaisir d'assister au 17e congrès de la société internationale de dialyse péritonéale (International Society of Peritoneal Dialysis – ISPD) du 5 au 8 mai 2018 dans la splendide ville de Vancouver, au Canada. Mille trois cents délégués du monde entier étaient présents. Les membres du conseil d'administration de l'ACITN, Michele Trask (directrice des communications), Janice MacKay (présidente élue/trésorière), et moi-même avons fourni un soutien administratif au moment de l'inscription. Accueillir au Canada des délégués provenant des quatre coins du globe fut une expérience mémorable!

Les professionnels de la santé en néphrologie se trouvaient en grand nombre à Vancouver. En effet, les réunions annuelles de la SCN (Société canadienne de néphrologie), de la CANA (Canadian Association of Nephrology Administrators), et du Réseau Can-SOLVE CKD coïncidaient au courant de la semaine. Il était intéressant d'observer les conférenciers et les délégués passer ainsi d'un hôtel à l'autre au cœur du centre-ville de Vancouver.

Le congrès de l'ISPD portait sur les soins centrés sur le patient en vue de mobiliser et d'encourager les patients et leur famille à participer à la prise de décision relative à leur cheminement en soins néphrologiques. Des patients participaient à la rencontre et ont présenté leurs points de vue et leurs idées visant à améliorer les soins. Après tout, c'est pour eux que nous pratiquons ce métier! Les séances étaient dynamiques et participatives. La plupart duraient deux heures et comportaient de nombreux conférenciers et points de vue pour chaque sujet. Les présentations de transfert et de partage des connaissances (Brag and Steal), où les conférenciers ont raconté des histoires de réussites afin que les participants puissent reproduire ces succès dans leur milieu de soins, ont suscité d'excellentes questions et des débats des plus intéressants.

À mes collègues infirmières et infirmiers en DP, vous êtes FORMIDABLES! Enseigner les compétences nécessaires pour effectuer la dialyse péritonéale à domicile est la clé de la réussite. J'étais déçue que ce facteur n'ait pas été pris en compte dans les études de recherche des séances simultanées auxquelles j'ai assisté. Je crois que la combinaison des compétences, le ratio personnel infirmier-patients, les années de formation, et la facilité d'accès aux services de suivi améliorerait de façon considérable non seulement le taux de réussite de la dialyse péritonéale, mais surtout, la satisfaction des patients. Je vous encourage tous à participer à des initiatives de recherche dirigées par le personnel infirmier dans vos unités de soins, car ces dernières contribuent à améliorer la pratique clinique et l'expérience des patients. Les membres de l'ACITN seraient ravis d'en savoir davantage sur vos recherches dans notre journal électronique, et par des affiches et des conférences dans le cadre de notre symposium national.

Du 18 au 20 juin, 2018 à Ottawa, j'assisterai au congrès biennal de l'Association des infirmières et infirmiers du Canada (AIIC) à titre de déléguée votante. L'AIIC est l'organisme professionnel national qui représente près de 139 000 infirmières et infirmiers autorisés au Canada. Nous sommes en cours de décision pour évaluer si nous allons élargir la composition de notre association au-delà des infirmières et infirmiers autorisés (IA) et les infirmières et infirmiers praticiens (IP) pour y inclure les infirmières et infirmiers auxiliaires autorisés (IAA) et les infirmières et infirmiers psychiatriques autorisés (IPA). Vous pouvez en savoir davantage en consultant le site Web de l'AIIC (www.cna.aiic.ca).

Les préparatifs sont en cours pour le symposium soulignant le 50e anniversaire de l'ACITN (« Notre passé guidera notre avenir ») à Québec du 25 au 27 octobre 2018. Nous avons hâte de vous y rencontrer.

Nous vous remercions de votre appui continu de l'ACITN et du travail que vous effectuez quotidiennement dans le but d'améliorer la vie de nos patients. Vous êtes FORMIDABLES!!

Votre partenaire en soins infirmiers,
Heather Dean, IA, CNéph(C)
Présidente de l'ACITN 2016–2018

Your Board in Action

As I write this, spring has not sprung yet, and we are still experiencing freezing weather. For those of us who enjoy spending time outside either hiking, exercising, or gardening, we are all looking forward to the warmer climate that spring and summer will bring.

The Canadian Nurses Association (CNA) National Nurses Week theme again this year is **#YESThisIsNursing**. The nurse who authored this theme felt inspired by the influence of technology in our practice and how this affects our awareness and connections across the globe. Now is an important time for our profession, with exciting opportunities for us to explore technology as a platform to engage, teach, learn, and share with our colleagues, allied health team members, and our patients.

Through these technological changes, we have occasion to share knowledge and experience through webinars, teleconferences, Skype, and surveys, to name a few. The ease of use of this collaboration technology increases the sharing and integration of the different modes of communication (e.g., text, voice, data, images, and video) between nephrology professionals. I feel it also stimulates a greater willingness to share and reshape our views to promote the melding of critical nursing knowledge into caring initiatives in our practice.

I attended the American Nephrology Nurses Association (ANNA) National Symposium in Las Vegas in April 2018. The symposium featured a diverse program with over 850 delegates in attendance. ANNA truly works to their mission to improve members' lives through education, advocacy, networking, and science. It was their 50th anniversary as an association.

MEMBERSHIP

We have a membership of 421 renal professionals as of May 2018. The Board of Directors (BOD) continually evolves to provide enduring benefits to all our members. I am seeking input from our valued membership, and I want to hear from you on ways to increase our association membership. Please share your thoughts with us by contacting your CANNT office team at: **cannt@cannt.ca** or phone: 613-507-6053

Membership is vital to CANNT, as it is an association run by membership. There are many advantages to becoming a member of CANNT:

- Member access to the online *CANNT Journal*
- Access to **www.cannt.ca** "Members Only" section
- Reduced rates at the annual nephrology symposium
- Access to *CANNT Nephrology Nursing Standards and Practice Recommendations* and the *CANNT Standards of Nephrology Technical Practice*
- Promotion of and support for specialty certification
- Continuing education opportunities—through the journal and online webinars
- Opportunities to recognize excellence in practice with yearly awards
- Access to educational bursaries and research grants
- Promotion of evidence-based practice
- Collaboration within the nephrology community
- Maintaining your yearly membership in CANNT assists with the long-term viability of our association.

Janice MacKay (President Elect CANNT) connecting with CANNT member and Past President Marilyn Muir at the ANNA National Symposium

JOURNAL

Guidelines for journal article submission can be found under the "CANNT Journal" section of the CANNT website. We prefer manuscripts that present new clinical information or address issues of special interest to nephrology nurses and technologists.

E-mail your manuscript to Jovina Bachynski at **CANNT.journal1@gmail.com**

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

The *CANNT Journal* is published four times per year in electronic versions. The journal is a refereed publication and accepts only original, peer-reviewed articles. Advertising opportunities and corporate sponsored education opportunities are available.

COMMUNICATIONS

We continue to develop new strategies for engaging our members, and communicating timely and relevant information to our membership. *Your CANNT Connection* is our bi-monthly email that works to provide strategic, targeted, personalized, and properly segmented information to our members. Additionally, we try to keep the content simple, direct, to the point, and useful with a goal to engage members on a continual basis. If you have a question, idea, or event to promote, please speak to our Director of Communications Michelle Trask.

CANNT website (www.CANNT.ca)
Twitter: @CANNT1

ANNA National Symposium 2018 Las Vegas, NV. From left to right: Maria Teresa Parisotto (Secretary, EDTNA), Alice Hellebrand (President, ANNA), Janice MacKay (President-Elect, CANNT), and Edita Noruisiene (President, EDTNA)

ANNUAL CONFERENCE

CANNT 2018 is themed "Our Past Will Guide Our Future", and your conference committee is working hard to create an innovative and exciting 50th anniversary program to meet the needs of nephrology professionals from novice to advanced practice. We hope to see you in Quebec City on October 25–27, 2018.

FINANCES

As a "Not for Profit" professional association, our objective is to provide value to our members that aligns with our mission and vision. We continue to explore development, collaborative and lucrative opportunities to assist in maintaining the viability of the association. Transparency improves the coherence and cohesion of our association, and provides our association membership with the 2017 Annual Report on the CANNT website (**http://www.cannt.ca/en/about/index.html**).

Janice MacKay
CANNT President-Elect/Treasurer
2016–2018

JANICE MACKAY

Votre conseil en action

Au moment d'écrire ces lignes, le printemps n'a pas encore daigné nous honorer de sa présence et il fait encore un temps glacial. Ceux parmi nous qui aiment profiter du plein air en faisant de la randonnée, du jardinage ou tout autre exercice estival n'attendent que l'arrivée du temps plus clément signalant le début de la belle saison.

À l'instar de l'année dernière, le thème de la Semaine nationale des soins infirmiers de l'Association des infirmières et infirmiers du Canada (AIIC) est une fois de plus #VoiciLesSoinsInfirmiers. L'infirmière qui a proposé ce thème s'est inspirée de l'influence de la technologie dans notre pratique et la façon dont celle-ci façonne la sensibilisation et les liens à travers le monde. C'est une période importante et dynamique pour notre profession, alors que la technologie nous offre des possibilités stimulantes de nous mobiliser, d'enseigner, d'apprendre et de communiquer avec nos collègues, les membres des équipes de soins de santé connexes et nos patients.

Grâce à ces avancements technologiques, nous avons la possibilité de disséminer les connaissances et l'expérience au moyen de webinaires, de téléconférences, de Skype et de sondages, parmi d'autres méthodes. La facilité d'utilisation de cette technologie collaborative améliore le partage et l'intégration des divers modes de communication (p. ex., texte, voix, données, images, et vidéo) entre les professionnels de la néphrologie. Je crois également que cette technologie favorise une plus grande ouverture à communiquer et à redéfinir notre façon de voir les choses, et ce, dans le but de contribuer à transformer le savoir infirmier essentiel en initiatives bienveillantes au sein de notre pratique.

J'ai assisté au symposium national de l'ANNA (American Nephrology Nurses Association National Symposium) à Las Vegas en avril 2018. Ce symposium offrait une programmation diversifiée et comptait plus de 850 délégués. L'ANNA fait réellement honneur à sa mission d'améliorer la vie de ses membres par l'éducation, la défense des droits, le réseautage, et la science. Ils fêtent le 50e anniversaire de leur association.

Janice MacKay (présidente élue de l'ACITN) ommuniquer avec le membre de la CANNT et la présidente sortante, Marilyn Muir, au Symposium national de l'ANNA

En compagnie de Marilyn Muir, ancienne présidente et membre de l'ACITN, au symposium national de l'ANNA.

ADHÉSION

Notre association compte actuellement 421 professionnels en néphrologie (en date de mai 2018). Le Conseil d'administration (CA) évolue continuellement pour offrir des avantages tangibles à tous nos membres. Je sollicite les commentaires de nos précieux membres sur les façons d'accroître le nombre d'adhésions à notre association. Pour nous faire part de vos réflexions à ce sujet, écrivez à l'équipe du bureau de l'ACITN à **cannt@cannt.ca** ou en téléphonant au 613-507-6053.

Comme nous sommes une organisation dirigée par ses membres, l'adhésion à l'ACITN est essentielle. D'ailleurs, celle-ci offre de nombreux avantages :

- L'accès au journal électronique de l'ACITN;
- L'accès à la section réservée aux membres du site www.cannt.ca;
- Des tarifs réduits pour le symposium annuel de néphrologie;
- L'accès aux normes de pratique infirmière en néphrologie et aux normes de pratique technologique en néphrologie de l'ACITN;
- Promotion et soutien pour les certificats de spécialisation;
- Possibilités de formation continue – par le journal en ligne et des webinaires;
- Reconnaissance de l'excellence dans la pratique grâce à nos prix de reconnaissance annuels;
- L'accès à des bourses d'études et des subventions de recherche;
- Promotion de la pratique fondée sur l'expérience clinique;
- Collaboration au sein du secteur de la néphrologie;
- Le maintien de l'adhésion annuelle à l'ACITN contribue à la viabilité à long terme de notre association.

JOURNAL

Vous trouverez les lignes directrices pour soumettre un article aux fins de publication dans notre revue à la section « CANNT Journal » du site Web de l'ACITN. Nous privilégions les manuscrits qui présentent de nouveaux renseignements cliniques ou qui abordent des enjeux présentant un intérêt particulier pour les infirmières et infirmiers et les technologues en néphrologie.

Envoyez votre manuscrit par courriel à Jovina Bachynski à l'adresse **CANNT.journal1@gmail.com**

Veuillez y joindre une lettre d'accompagnement comportant les coordonnées du principal auteur et une notice biographique d'une phrase (titre, emploi actuel et lieu de travail) pour chaque auteur.

Le CANNT Journal est publié quatre fois par année sous forme électronique. Le journal est une publication à comité de lecture et n'accepte que les articles originaux évalués par les pairs. Des occasions de publicités et des possibilités de formation parrainées par des entreprises sont offertes.

COMMUNICATIONS

Nous continuons d'élaborer de nouvelles stratégies pour mobiliser nos membres et leur transmettre des renseignements pertinents en temps opportun. Your CANNT Connection est un bulletin d'information bimensuel transmis par courrier électronique (en anglais) qui vise à offrir à nos membres des renseignements ciblés, personnalisés et correctement segmentés. *Nous essayons en outre d'offrir un contenu simple, direct, pertinent et utile dans le but de mobiliser nos membres de façon continue*. Si vous avez une question, une idée ou un événement à faire connaître, vous pouvez écrire à notre directrice des communications Michelle Trask.

ANNA National Symposium 2018, Las Vegas, Nevada. De gauche à droite : Maria Teresa Parisotto (secrétaire de l'EDTNA), Alice Hellebrand (présidente de l'ANNA), Janice MacKay (présidente élue de l'ACITN), et Edita Noruisiene (présidente de l'EDTNA)

Site Web de l'ACITN (www.CANNT.ca)
Twitter : @CANNT1

CONGRÈS ANNUEL

Le Congrès annuel 2018 de l'ACITN a pour thème « Notre passé guidera notre avenir ». À l'occasion du 50e anniversaire de l'association, le comité du congrès travaille avec ardeur pour créer une programmation novatrice et captivante qui répond aux besoins des professionnels en néphrologie débutants et chevronnés. Nous espérons vous voir à Québec du 25 au 27 octobre 2018.

FINANCES

En tant qu'association professionnelle à but non lucratif, notre objectif est d'offrir une valeur ajoutée à nos membres afin de remplir notre mission et de concrétiser notre vision. Nous recherchons constamment des occasions de développement, de partenariat, et de possibilités lucratives pour maintenir la viabilité de l'association. Comme la transparence améliore la cohérence et la cohésion de notre association, nos membres peuvent consulter le rapport annuel 2017 de l'association sur le site Web de l'ACITN (**http://www.cannt.ca/en/about/index.html**)

Janice MacKay
Présidente élue de l'ACITN
2016–2018

We are very excited to welcome Canadian nephrology professionals—nurses, technologists, administrators, researchers, pharmacists, and more—to CANNT 2018 hosted in Quebec City, QC! As is our tradition, this year's conference promises a multitude of learning opportunities for all nephrology professionals.

Experience all the CANNT 2018 has to offer:

- Join your colleagues at this year's CANNT/ACITN 50th anniversary celebration and conference.
- Collaborate, network, and learn as we let "*our past guide our future*" in nephrology nursing and technological practice.
- Participate in the plenary sessions, concurrent sessions, workshops, poster presentations, and learning opportunities presented by our members and corporate sponsors.
- When the sun goes down … let the charms of Old Quebec lure you into adventures—perhaps a ghost walk or a river cruise.

Whatever you choose, this year's conference is sure to be an event to remember.

Hosted at the Québec City Convention Centre / Centre des congrès de Québec, this conference will re-energize, motivate, and engage you! Register today! CANNT 2018 information is available at **www.cannt.ca**

ABSTRACTS

CANNT's mission is to provide leadership and promote excellence in nephrology care through education, research, and communication. CANNT's goals encompass the promotion of best practice through the provision of educational and networking opportunities, and the promotion of evidence-based practice. CANNT's national conference, CANNT 2018, is the perfect platform for accomplishing these goals. We are pleased to print the abstracts that will be presented in oral and poster formats at this year's annual conference in this issue of *CANNT Journal*.

The following abstracts celebrate the diversity of key topics in nephrology nursing and technological practice that are being investigated and discussed across Canada. It is our hope that CANNT members interested in pursuing a profiled topic will contact the CANNT National Office at 613-507-6053 or **cannt@cannt.ca** to receive information regarding how to contact the respective author about their work. We encourage you to carefully review these abstracts!

Nous sommes très heureux d'accueillir les professionnels canadiens en néphrologie—notamment le personnel infirmier, les technologues, administrateurs, chercheurs et pharmaciens – au congrès de l'ACITN qui se tiendra dans la belle ville de Québec! Comme le veut notre tradition, la rencontre de cette année offrira une multitude d'occasions d'apprentissage pour tous les professionnels œuvrant dans le domaine de la néphrologie.

Profitez pleinement de toutes les activités offertes dans le cadre du congrès de l'ACITN 2018 :

- Retrouvez vos collègues cette année pour le congrès de l'ACITN/CANNT et célébrez le 50e anniversaire de l'association.
- La collaboration, le réseautage et l'apprentissage sont au programme, car « Le passé est garant de l'avenir » en matière de pratiques infirmières et de pratiques technologiques en néphrologie.
- Participez à des séances plénières, séances simultanées, ateliers, présentations par affiche, et profitez des occasions d'apprentissage présentées par nos membres et nos entreprises commanditaires.
- Au crépuscule, laissez-vous charmer par les splendeurs du Vieux-Québec et partez à l'aventure – pourquoi ne pas vous laisser tenter par une visite fantôme ou une croisière sur le fleuve?

Peu importe ce que vous choisissez, le congrès de cette année sera assurément mémorable.

Rendez-vous au Centre des congrès de Québec pour une rencontre qui ne manquera pas de vous dynamiser, vous motiver et vous inspirer! Inscrivez-vous dès maintenant! Vous trouverez des renseignements sur le congrès de l'ACITN/CANNT 2018 au **www.cannt.ca**

ABRÉGÉS

La mission de l'ACITN est de guider ses membres et de promouvoir l'excellence en matière de soins dans le domaine de la néphrologie par la formation, la recherche et la communication. L'ACITN vise la promotion des pratiques exemplaires en offrant des occasions d'apprentissage et de réseautage, et en encourageant la pratique fondée sur l'expérience clinique. Le congrès national de l'ACITN 2018 constitue la plateforme idéale pour accomplir ces objectifs. Dans ce numéro du *CANNT Journal*, nous sommes heureux de publier les abrégés qui seront présentés sous forme d'exposés oraux et de présentations par affiche dans le cadre du congrès annuel de cette année.

Les abrégés suivants soulignent la diversité des principaux enjeux en cours d'étude et de discussion dans tout le pays relativement aux pratiques infirmières et aux pratiques technologiques en néphrologie. Les membres de l'ACITN qui souhaitent en apprendre davantage sur un sujet à l'étude peuvent communiquer avec le bureau national de l'ACITN au 613-507-6053 ou à **cannt@cannt.ca** pour obtenir des renseignements sur la marche à suivre pour entrer en contact avec les auteurs respectifs des ouvrages. Nous vous encourageons à lire attentivement ces abrégés!

Oral Presentations

1. I Need A Vacation! Supporting Home Hemodialysis Patients Who Want to Travel With Their Dialysis System

Mary L. Lewis, BScN, RN, CNeph (UK)
Sarah Thomas, BSN, RN, CNeph(C), Vancouver, BC

Home hemodialysis (HHD) is a well-established treatment option. Dialyzing in the home allows patients to live their lives as normally as possible.

In spite of the benefits and freedom that HHD offers, Canadian patients have not been able to travel with their HHD system until this past year. Vacations and work trips can take many months of advanced planning to secure a dialysis spot, and destinations are limited. Furthermore, patients often incur significant out-of-pocket costs.

This presentation will share the recent travel experiences of several HHD patients who have travelled with their portable dialysis system while biking in Hawaii, wine tasting in France, or just indulging in a long weekend away without the usual dietary and fluid restrictions. Car, recreational vehicle (RV), cruise ship, and air travel options will be described.

The British Columbia Provincial Renal Agency (BCPRA) HHD travel document written to safely and effectively manage travelling HHD patients will be outlined. Tips and advice from the Canadian Air Transport Association (CATSA) and the US Board of Transport, and how to deal with the airlines will be shared.

Although most of the patient stories are positive and heartwarming, the pitfalls will also be shared. Overall, the presentation will highlight the importance of offering patients the choice and the freedom to travel.

2. Providing Hemodialysis Services in a Rehabilitation/Complex Care Setting

Lori Harwood, PhD, RN(EC), CNeph(C)
April Mullen, BScN, MHM, RN
Janice Qubty, BScN, RN
Kyle Goettl, BScN, RN, Med IIWCC
Elizabeth Clinton, Patient/Caregiver Advisor, London, ON

Each week inpatients from our local rehabilitation institute are transported to our in-centre unit for hemodialysis (HD) treatments. Inter-facility medical transportation is costly, and patients state that the travel time increases their fatigue, delays their rehabilitation, and impacts their quality of life. To improve the patient experience, create efficiency, and reduce travel costs, the renal team and teams from the rehabilitation centre are collaborating to provide HD services at the rehab centre. HD on-site should save patients/families time and energy, improve the patient experience, and decrease overall transportation costs.

This presentation will discuss the implementation of the new unit, describe how the unit operates, and also present preliminary findings from a research-based evaluation. This qualitative, theory-driven, patient-oriented research proposes to evaluate the patient experience, economic impact, and operational evaluation of this initiative. The qualitative study will investigate complexities and nuances associated with the program, which is currently lacking in the literature. Interviews will be conducted with patients and caregivers to gain understanding of the patient/caregiver experience. HD staff will participate in a focus group and the rehabilitation staff will be surveyed to gather their perceptions of how this service influences the patient's rehabilitation and quality of life, as well as the impact and challenges to the healthcare providers' role.

3. An Educational Intervention to Support Implementation of a Patient-Reported Outcome Measure for Hemodialysis Patients in Ontario

Alysha Glazer, MPH, PMP, Ontario Renal Network
Marnie MacKinnon, BPE, Ontario Renal Network
Esti Heale, MBA, Ontario Renal Network
Carey Moolji, MHSc Ontario Renal Network
Jenna Evans, PhD, BHS, Cancer Care Ontario, Toronto, ON
Peter Blake, MD, FRCPC, Ontario Renal Network, London, ON
Michael Walsh, MD, PhD, Ontario Renal Network, Hamilton, ON

Purpose: The Ontario Renal Network (ORN) developed a standardized approach to symptom assessment for eight regional renal programs in Ontario. The project, known as "Your Symptoms Matter" (YSM), uses the Edmonton Symptom Assessment System Revised: Renal (ESAS-r:Renal) questionnaire. An educational intervention was designed with the aim of engaging providers and patients in the YSM project and preparing them to use the ESAS-r:Renal tool.

Description: A "train-the-trainer" model was used to educate Project Champions who, in turn, trained members of their healthcare teams and patients to support YSM implementation. A total of 105 Project Champions across disciplines were trained.

Evaluation/Outcomes: The educational intervention was evaluated using provider and patient surveys. More than 84% of providers (n=518) agreed that the education enhanced their understanding of why and how YSM will be implemented. Providers self-reported more positive attitudes about symptom management post-education, including that it is within their scope of responsibilities (10% increase) and that a validated tool for symptom screening should be considered best practice (21% increase). Providers expressed more confidence in assessing patient symptoms using ESAS-r:Renal than in managing them.

More than 90% of patients (n=727) felt they had at least an average understanding of why and how to complete ESAS-r:Renal. Since ESAS-r:Renal was implemented, there have been 5,154 screening attempts with 95% completed and 5% declined.

Implications: The "train-the-trainer" model was effective in preparing providers and patients for YSM implementation, and enhancing their buy-in. The results also revealed opportunities for improving the model with additional resources on how to manage complex symptoms.

4. La Dialyse Péritonéale Automatisée Adaptée (DPAa)—Optimiser la thérapie sur cycleur

Nicole Gagné, infirmière, CNeph(C), Boucherville, QC

La dialyse péritonéale automatisée (DPA) est une modalité de dialyse très populaire chez les patients en dialyse péritonéale. Cette présentation a pour but d'expliquer une approche innovatrice qui permet d'individualiser la prescription en DPA, afin d'optimiser l'ultrafiltration et la clairance.

La présentation couvrira la définition de la DPAa, ses avantages, une brève revue de la littérature existante et les bénéfices pour les patients.

Cette approche de traitement offre une alternative intéressante qui peut être utilisée pour améliorer les résultats d'ultrafiltration et de clairance chez les patients en dialyse péritonéale automatisée.

5. Using Technology to Guide the Future of Vascular Access

Deidra Goodacre, BSN, RN, CNeph(C), Prince George, BC
Danielle McLaren, RN, CNeph(C), Kelowna, BC

Purpose: Emphasis on transplant and peritoneal dialysis as first choice modalities has led to a change in our hemodialysis client population in BC. The population is aging, and cardiac and vascular comorbidity is increasing. In BC, we are attempting to maintain a high level of fistula prevalence, but fistulas are becoming more difficult to create, cannulate, and maintain. We were unable to find a specialized ultrasound training course designed for hemodialysis nurses that could be easily replicated. Hence, we developed a course that would meet the new needs in our program based on the competencies outlined by Marticorena et al. (2015).

Description: We will discuss the successes, challenges, and lessons learned after running the course in two separate health regions. We will provide practical tips and resources for renal programs wanting to implement a course of their own. Handouts/resources will include: education funding proposal template, three easy-to-follow lesson plans with links to videos and PowerPoint presentations, pre- and post-tests, and sample case studies.

Evaluation/Outcomes: Pre- and post-course knowledge evaluations, nurse feedback, client feedback, and peer feedback will be discussed.

Implications for Nephrology Practice/Education: This course intends to fill the knowledge gap by providing a lesson plan framework and resources that can be used and implemented by any hemodialysis educator or vascular access nurse. By increasing the knowledge and cannulation skill level of dialysis nurses using innovative, engaging teaching techniques, and ultrasound technology, we will strive to provide "the highest quality vascular access care for patients with end stage renal disease" (Marticorena & Donnelly, 2012).

REFERENCES

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Marticorena, R.M., Mills, L., Sutherland, K., McBride, N., Kumar, L., Concepcion Bachynski, J., … Donnelly, S. (2015) Development of competencies for the use of bedside ultrasound for assessment and cannulation of hemodialysis vascular access. *Canadian Association of Nephrology Nurses and Technologists Journal*, *25*(4), 28–41.

6. Transplant 101: Is My Patient a Candidate for Transplantation?

France Martineau, BScN, LcSC Ed, RN, Montreal, QC

This presentation will serve as an introduction to the kidney transplant process and will be an interactive discussion with the audience. Four main questions will be presented and discussed:

The first question (*Is my patient on the transplant list*?) will provide a discussion around the following topics:

a) Has the patient had a discussion about the transplant process?
b) Are there any contraindications (e.g., cancer, compliance) to the patient being a candidate for the transplant process?
c) Why is the patient on dialysis for so many years before obtaining a transplant?

The next step in the process is to determine the best time to speak to a patient about a kidney transplant and when the referral should be initiated.

The third topic for discussion will revolve around the patients' long-term survival and how a transplant improves this, as well as a discussion around the risks and benefits of a kidney transplant.

Lastly, we will discuss eligibility of patients for transplant. This will include a case review of a patient who was declined for a kidney transplant along with a review of the transplant data over the past five years including number of transplants, number of referrals, and the criteria used for evaluating deceased donors.

7. L'épuisement professionnel et l'empowerment des infirmières travaillant en hémodialyse au Québec

Christina Doré, infirmière, PhD, Université du Québec en Abitibi-Témiscamingue, Laval, QC
Linda Duffett-Leger, infirmière, PhD, Université de Calgary, AB
Mary McKenna, PhD, Université du Nouveau-Brunswick, NB

La profession infirmière est reconnue pour être stressante avec des taux élevés d'épuisement professionnel. La recherche indique que l' « empowerment » est une stratégie positive pour soutenir la pratique et le bien-être au travail des infirmiers (ères). En management, il y a deux perspectives distinctes de l'empowerment. La première, qualifiée de structurelle et la seconde, qualifiée de psychologique. L'empowerment structurelle se concentre sur les mesures prises par l'organisation pour améliorer le pouvoir partagé entre le gestionnaire et les infirmiers (ères) et la prise des décisions influençant la façon dont les infirmiers (ères) accomplissent leur travail. L'empowerment psychologique se concentre sur les caractéristiques de l'individu contribuant à un état cognitif d'empowerment et un sentiment de contrôle sur les situations. Récemment, la recherche indique que les sites Web professionnels pourraient promouvoir l'empowerment et réduire le risque d'épuisement. Actuellement, aucune information ne permet d'évaluer la gravité de l'épuisement professionnel ou le statut d'empowerment des infirmiers (ères) en hémodialyse au Québec. La présentation a pour but de rapporter les résultats d'une étude mixte: une enquête quantitative en ligne auprès de 308 infirmiers (ères) en hémodialyse a démontré que 38% avaient des niveaux élevés d'épuisement émotionnel, 69% des niveaux modérés d'empowerment structurel et 64% des niveaux modérés d'empowerment psychologique. L'empowerment structurel et psychologique étaient significativement liés à l'épuisement professionnel. Ensuite, une approche participative utilisant des groupes de discussion avec un total de sept infirmiers (ères) en hémodialyse et des consultations auprès d'un comité aviseur a permis de formuler des recommandations sur les exigences à inclure dans un site Web. Les résultats indiquent qu'un futur site Web professionnel pour les infirmiers (ères) en hémodialyse devrait inclure: des informations professionnelles, de la formation continue, des informations sur les habitudes de vie saine et le réseautage. Dans l'ensemble, cette recherche a des implications importantes pour les infirmiers (ères), la pratique et la recherche. Les niveaux d'épuisement étaient élevés chez les infirmiers (ères) d'hémodialyse au Québec, semblables à d'autres résultats nord-américains; et les infirmiers (ères) d'hémodialyse étaient en faveur de la création d'un site Web pour répondre à leurs besoins professionnels et personnels.

8. Ontario Renal Network (ORN) Person-Centred Decision-Making: Implementing Goals of Care Conversations

Jade Rust, MPH, Ontario Renal Network
Jennifer Minelli, M Eng, Ontario Renal Network
Tara Walton, MPH, Ontario Renal Network
Sharon Gradin, PMP, BScN, RN, Ontario Renal Network,
Marnie MacKinnon, BPE, Ontario Renal Network, Toronto, ON
Peter Blake, MD, FRCPC, Ontario Renal Network, London, ON

Purpose: In the Ontario Renal Plan II, palliative care was identified as a priority for people living with advanced chronic kidney disease. A province-wide intervention is being implemented to ensure that by 2019 all chronic dialysis patients will have their Goals of Care (GOC) assessed annually to inform their treatment decisions (TD).

Methods: An approach to GOC data collection was developed, including information about a patient's Substitute Decision Maker, illness understanding, code status, and if goals and values have been incorporated into a documented plan of treatment.

A data submission tool was developed to capture patient GOC and TD via regular submissions from regional renal programs. More than 500 providers were educated on GOC and TD conversations. Provider and patient education resources on GOC and their role in developing a plan of treatment were also developed.

Results: Of chronic dialysis registrants from April to June 2017 in Ontario, 33% had GOC documented within 90 days after chronic dialysis registration, which is in line with expectations. Sixty-four percent of patients had incomplete data submitted, with only 3% of records missing.

Conclusions: Many programs incorporate GOC conversations into patient care; however, a consistent and province-wide process is new. Collection of GOC data will continue quarterly, improving the accuracy of the indicator and allowing for correlations to be meaningfully explored.

Implications for Nephrology Practice: GOC conversations ensure that TD are aligned with patient wishes, values, and beliefs, and that patients are supported throughout their care journey. Providers can also introduce the concepts of palliative care and share the benefits of early integration with treatment.

9. En route vers l'autonomie : de l'adolescence à l'âge adulte pour un meilleur accompagnement

Danielle Boucher, IPSN, M.SC., D.E.S.S., CNeph(C),
Ste-Brigitte-de-Laval, QC
Liane Dumais, IPSN, M.SC., D.E.S.S., Ste-Brigitte-de-Laval,QC

L'adolescent cheminant vers l'âge adulte doit relever de nombreux défis et le développement de l'autonomie en est un de taille. L'adolescent atteint d'une maladie chronique comme l'insuffisance rénale est confronté à cette même réalité. Il doit en plus composer avec les exigences de traitement de la maladie. Les enjeux développementaux de ces derniers sont nombreux et doivent passer par la consolidation de leur identité en intégrant la maladie comme une part d'eux-mêmes.

La non-adhésion au traitement est un problème important chez les adolescents insuffisants rénaux. Selon la littérature, elle est influencée par de nombreux facteurs dont les caractéristiques de la maladie et de son traitement, le contexte familial mais aussi par la capacité de l'adolescent à devenir autonome. Malheureusement, celui-ci progresse plus lentement vers le développement de son autonomie.

Les infirmièr(e)s ouvrant auprès de cette clientèle, doivent comprendre cette réalité afin de mieux les accompagner dans l'acquisition de leur autonomie, notamment lors de la transition du milieu de soins pédiatrique aux soins adultes.

Dans ce contexte de recherche identitaire et de développement de l'autonomie, le jeune majeur atteint d'insuffisance rénale doit en plus apprendre à naviguer dans un système de soins adulte avec une dispensation de soins et de services plus fragmentée. Devrions-nous revoir nos façons de faire auprès de ces jeunes adultes dans nos cliniques? Comment faire la transition du milieu de soins pédiatrique aux soins adultes?

La littérature révèle des pistes de solutions afin d'améliorer l'approche auprès de cette clientèle et conséquemment favoriser une meilleure adhésion au traitement.

10. The Integration of LPNs in a Hemodialysis Unit: Building on the Foundations Laid Before Us

Sheriane Cowie, BScN, RN, Montreal, QC

"It has been seen from research that patients do benefit from appropriate staff mix, as do healthcare facilities" (CNA, 2005). Centres across Canada have integrated licensed practical nurses (LPNs) in their hemodialysis (HD) centres, as a response to the declining numbers of registered nurses (RNs), and the increased acuity of patients (CNA, 2005). In our centre, the increase in patient acuity and workload for the nurses has resulted in a decrease in completed nursing assessments, nursing follow-ups, and positive patient outcomes. The desire to augment the

quality of care in our centre was the impetus for adopting a collaborative practice by introducing LPNs to the staff mix.

A pilot project was initiated in February 2017. At the outset, we met with the nursing staff to get their feedback. Their responses were predominantly favourable, with a select few resistant to the change. In preparation for the project, we reviewed the literature and visited centres functioning in a mixed-skills environment. Although eight LPNs were trained, two did not meet the criteria. One month into the project, the six remaining LPNs were widely accepted and even embraced by the team. We presented our project to our nursing director on November 28, 2017, highlighting the projected improvements in nursing and patient outcomes. Consequently, we were mandated to integrate the LPNs in our department by April 2018.

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11. J'ai besoin d'un rein: comment en parler avec mes proches?

Liane Dumais, IPSN, M. Sc., D.E.S.S., Québec, QC

Le don vivant est une option thérapeutique avantageuse pour le candidat à la greffe rénale. Les bienfaits sont multiples pour le receveur et ont été largement démontré en terme de meilleur fonctionnement et de survie du greffon, de qualité de vie améliorée et la possibilité d'une greffe préemptive afin d'éviter la dialyse.

Toutefois, le patient est souvent réticent à solliciter ses proches pour un don vivant. Il ne sait pas comment aborder ce sujet ou, il ne veut tout simplement pas l'aborder.

La littérature nous apprend que la crainte de porter préjudice à la santé d'un proche, d'un refus, le manque de connaissances sur le sujet et les croyances personnelles en lien avec le don vivant constituent des barrières fréquemment évoquées par le patient.

L'infirmièr(e), en raison de son lien de proximité avec le patient, peut jouer un rôle important dans cette démarche. L'infirmier(e) est souvent mal à l'aise à aborder cette question et ne peut ainsi aider adéquatement le patient à discuter de ce sujet avec ses proches. Comment outiller les infirmièr(e)s afin d'actualiser leurs connaissances et leurs compétences pour en parler avec le patient et mieux le soutenir dans sa démarche auprès de ses proches?

Afin de répondre à cette question, une revue de littérature sera présentée et permettra d'identifier les interventions et les approches qui aideront l'infirmière à outiller le receveur afin d'aborder ses proches pour ce type de don.

12. From Cannulation to Complications: Integrating a Learner-Centred Approach to Delivering Hemodialysis Nursing Orientation

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The Ottawa Hospital's nephrology program identified the need to enhance the content and delivery of the hemodialysis nursing orientation to improve nurse retention and preparation. Practising hemodialysis skills in the clinical environment early on in orientation was found to be anxiety-provoking for the newly hired nurse, as well as for the patient. Learner and staff feedback underlined that the environment was not conducive to learning, and that teaching methods were outdated.

A literature review highlighted a gap between the status quo and best practices for adult learning. In January 2017, the nephrology program shifted the second week of hemodialysis orientation to a simulation centre to foster a safe learning environment. New hires now engage in a full week of active hands-on learning prior to practising skills in the clinical environment with the aim of increasing their self-confidence. Additionally, a three-month post-orientation workshop involving high-fidelity simulation and advanced hemodialysis skills was implemented, as part of a quality improvement project.

The simulation environment provides innovative opportunities for teaching and assessing clinical competencies in preparation for clinical practice in the hemodialysis unit. This presentation will outline the process for the development and implementation of the revised curriculum using evidence-based resources. Perceived benefits for both the new hires and the patients will be highlighted.

13. Development of an Early Hospital Readmission Risk-Prediction Model for Kidney Transplant Recipients

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Jayoti Rana, BSc, MPH
Franz-Marie Gumabay, BSc
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Purpose: Early hospital readmissions (EHR) confer high costs to the healthcare system and are associated with suboptimal outcomes in kidney transplant recipients (KTRs). Current literature focuses on identifying explanatory

factors for EHRs, and few studies provide implications for clinical practice. We aim to develop an EHR risk prediction model to use as a tool that can be integrated into clinical practice to reduce future EHRs.

Methods: We conducted a single-centre, retrospective cohort study, including adult KTRs transplanted between July 1, 2004, and December 31, 2014, at the Toronto General Hospital and followed for at least 30 days from transplantation admission discharge. EHR risk prediction models were developed using stepwise backward logistic regression and compared for predictive ability using ROC curves. Bootstrapping was used to internally validate the final EHR risk prediction model.

Results: In our cohort of 1,381 KTRs, 267 experienced at least one EHR post-transplant. Our most parsimonious model consisted of 12 variables, such as age, and resulted in a moderate predictive value (ROC=0.65). However, no recipient, donor, and transplant risk factor was highly predictive of EHR. Internal validation resulted in a lower predictive value (ROC=0.61).

Conclusions: The predictive accuracy value of our model could possibly be improved by adding variables such as patients' socioeconomic factors and surgical complications during transplant admission.

Implications for Care: The risk prediction model provides a uniform method to assess and predict EHR in Canadian KTRs. The ability to identify patients who are at higher risk of experiencing EHR will allow practitioners to deliver individually-tailored interventions and reduce future readmissions.

14. Employment Patterns After Kidney Transplantation: Rates, Contributing Factors, and Outcomes

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Background: The costs of productivity lost in transplant patients poses a concern, as a significant number of patients are of working age**.** Furthermore, healthcare and public health literature highlight the relationship between a lack of secure income and poor health outcomes. However, few studies have examined predictors of paid employment post-transplant and the impact of employment status on clinical outcomes.

Objectives: (1) To investigate the rates and predictors of post-transplant employment status; and (2) to examine the association between post-transplant employment status and clinical outcomes in kidney transplant recipients (KTRs).

Methods: A retrospective cohort study was conducted in adult patients undergoing a kidney transplant between January 1, 2007, and December 31, 2014, with follow-up until December 31, 2015, at the Toronto General Hospital. Employment status and clinical data were obtained from paper and electronic charts. The Kaplan-Meier product limit method was used to assess time to return to work and time to total graft loss from the transplant date. Multivariable Cox proportional hazards models were fitted to examine independent predictors of post-transplant employment, and the association between employment status and total graft loss.

Results: Among the 1,069 KTRs in the study cohort, the mean age was 50.7 years (± 13.6) and 60.2% were male. A total of 319 KTRs returned to work over the first year post-transplant (cumulative probability 30.4%). Significant independent predictors of employment within the first year post-transplant included pre-transplant employment status, age at transplant, length of stay in hospital after transplant, physical disability, and private drug coverage. After adjusting for relevant covariates (including comorbid conditions), being employed (versus not employed) post transplant was associated with a significantly lower risk of total graft loss (HR 0.29 [95% CI: 0.17, 0.50]).

Conclusions: Although transplantation improves working capacity in patients with end stage renal disease, post-transplant employment status was impacted by other factors, including pre-employment status. These findings support the need for pre- and/or post-transplant interventions to improve participation in paid work following kidney transplantation.

15. Quality of Life in Kidney Transplant Patients: A Five-Year Review

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Background: Transplantation success is evaluated by graft and patient survival. Quality of life, (QoL), which assesses overall health by evaluating physical, emotional, and social well-being, is potentially another useful metric to assess successful transplantation.

Objectives: To assess changes in QoL in kidney transplant recipients (KTRs) post-transplantation.

Methods: A QoL Assessment Survey comprising the Kidney Disease and QoL Short Form, End-Stage Renal Disease (ESRD)–Symptom Checklist and an adherence questionnaire were offered to all adult KTRs at Toronto General Hospital transplanted between 2007 and 2016 at baseline and one year post-transplant. Survey responses were used to calculate mean scores for six categories of QoL: Physical Functioning (PF), Role-Physical (RP), General Health (GH), Social Functioning (SF), Role-Emotional (RE), and Emotional Well-being (EW). We used paired student's *t*-test to compare QoL mean scores at baseline and one year post-transplant and unpaired student's *t*-test to compare QoL mean scores one year post-transplant to the general Canadian and ESRD populations.

Results: Of 879 KTRs, 343 patients completed a baseline and a one-year post-transplant QoL Assessment Survey. Compared to baseline, the PF, RP, EW and SF QoL mean scores significantly decreased at one year post-transplant. In comparison to the general Canadian population, KTRs at one year post-transplant had significantly lower mean scores for all QoL categories except for EW ($p<0.0001$), but significantly higher mean scores for all QoL categories in comparison to ESRD patients ($p<0.0001$).

Implications in Nephrology Care: The QoL Assessment Survey evaluates overall health of KTRs and demonstrates the ability to assess transplant success beyond graft and patient survival.

16. Home Dialysis Training Videos

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Purpose: The purpose of this project is to provide educational videos to supplement peritoneal dialysis training at the home dialysis unit.

Introduction: Our program serves patients from diverse cultural backgrounds, socioeconomic status, information retention ability and literacy levels. Current teaching methods are patient-specific, and include the use of a written manual, hands-on-practice, and demonstrations. We believe the addition of step-by-step instructional videos will enhance learning and can provide visual repetition that patients can access at their own convenience.

Description: We will start this project by creating two instructional videos on exit site care and carrying out a continuous ambulatory peritoneal dialysis (CAPD) exchange. Patients and their caregivers will be able to access these videos through the St. Michael's Hospital Home Dialysis website, or these can be given to them in a DVD or USB format.

Outcomes: By implementing the use of these videos, we aim to increase patient satisfaction and comfort, as well as to ensure patients follow proper technique in doing their peritoneal dialysis routine. We hope to achieve this by providing material to supplement hospital training and for patients to review procedures at home.

Implications for Nephrology Education: Exit site infections can lead to peritonitis (infection of the peritoneal membrane). Repeated peritonitis leaves the peritoneal membrane scarred, which then negatively impacts the efficacy of peritoneal dialysis. Infections remain a frequent cause of peritoneal dialysis failure. Developing methods to maintain optimal technique in doing peritoneal dialysis will improve patient outcomes.

17. Assessing the Delivery of Integrated Care to Patients with Chronic Kidney Disease in Ontario: Patient and Provider Perspectives

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Area of Focus: History and future directions of CKD and treatment.

Purpose of Study: Patients with chronic kidney disease (CKD) have complex health needs, and thus require care that is *integrated* across professionals and organizations. The extent to which patients with CKD in Ontario receive integrated care is unclear. This study assessed integrated care delivery across Ontario from provider and patient perspectives.

Methods: A five-item survey for providers was developed and administered via the web by the Ontario Renal Network (ORN) to 596 purposefully selected providers, including nephrologists, nurses, and social workers. Four items from the Patient Assessment of Chronic Illness Care (PACIC-26) survey were used to capture the patient perspective. The patient survey was administered to a random sample of 14,257 patients with CKD.

Results: A total of 314 providers, including 144 nurses, and 2,447 patients responded to the surveys. Key findings include that 36% of providers reported their patients' care

was well-coordinated across settings; 51% of providers reported they are aware of appropriate home and community services to support their patients; 20% of patients reported they were encouraged to attend programs in the community; and 38% of patients were asked how their visits with other doctors were going (% reporting 'always' or 'most of the time').

Conclusion: The survey results suggest that patients with CKD in Ontario are not consistently receiving integrated care.

Implications for Nephrology Care: Key areas for future improvement include linkages to community-based services and patient-provider communication. Standardized measurement of integrated care delivery over time, using surveys similar to the instruments utilized in this research study can support local quality improvement and broader system transformation.

18. Development of a 44-Hour Ambulatory Blood Pressure Monitor Training Program

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Purpose: Hypertension is widely prevalent in the hemodialysis population and the leading modifiable factor for cardiovascular outcomes. Unlike blood pressure (BP) measured during dialysis, ambulatory BP represents superior measurement of true BP load.

Description: We started 44-hour ambulatory blood pressure measurement at our tertiary care dialysis unit in 2012. Herein, we describe our five-year experience with 44-hour ABPM in regard to patient acceptance and nursing implications.

Outcomes: Forty-four-hour ambulatory blood pressure monitoring (ABPM) was pioneered at a tertiary care in-centre hemodialysis unit. It is well tolerated by patients, with an overall completion rate around 70%. In many cases, this assessment improved overall BP control, and has led to the avoidance of unnecessary escalation of BP-lowering medications, thereby preventing potentially dangerous hypotensive episodes during and in between HD treatments. It has also allowed for up-titration of BP-lowering drugs for patients with identified sustained high BP load.

The Ottawa Civic Campus hemodialysis unit serves as the centre for ABPM for our regional program. Forty-four-hour ABPM requires sophisticated equipment, which was provided by the nephrology program, as well as trained personnel to administer this test. Lack of well-trained professional personnel is the major limiting factor to administering this test at any given dialysis shift on any given day.

Implications: This presentation addresses this gap with the lack of trained nurses and focuses on the development of a pragmatically structured training program for ABPM for a core group of dialysis nurses in our dialysis unit and making ABPM widely available to hemodialysis patients within our regional program.

19. Using a Telehome Monitoring and Communication Platform to Enhance Nursing Support and Practice for Home-Based Renal Replacement Therapy

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As the use of home-based therapies increases, nursing practice struggles to find ways to support the growing number of patients. The CONNECT Trial, a multi-centre randomized controlled trial, aims to leverage past research and clinical expertise to seamlessly integrate modern technology into peritoneal dialysis care delivery, optimizing nursing practice and enhancing patient care. In June 2016, we began to evaluate the impact of a mobile and browser-based home dialysis management platform on patient engagement, clinical outcomes, and operational efficiency in peritoneal dialysis clinics. Interim results of this trial demonstrate that the integration of the platform has greatly improved quality of care delivered to patients by enabling healthcare team members to identify and intervene early in clinical situations through real time access to data from the home, as well as improved communication methods, including messaging and picture sharing. In addition, we will explore how the use of the platform has identified opportunities for patient re-education, increased patient confidence, and reduced feelings of isolation to empower patients to better manage their self-care. This study explores the significant positive impact that a home dialysis management platform can have on patient health outcomes and confidence by establishing a new and innovative way of providing care to patients.

20. Dying with Dignity: A Hemodialysis Medical Assistance in Dying (MAID) Case

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The goal of patient care in nephrology is to achieve good quality of life for patients with chronic life-limiting illness. End-stage renal disease (ESRD) is associated with limited life expectancy, high morbidity, and burden of symptoms. Dialysis is often burdensome and, increasingly, patients, families, and healthcare teams express doubts about the quality of life of individuals with multiple other health problems (Brown, Chambers, & Eggeling, 2008). Among patients on dialysis, survival rates and complexity of comorbidities are increasing; in addition, withdrawal from dialysis is becoming a more common cause of death in these patients. The prognosis and outcome of this patient population can be difficult to predict. This unknown aspect in health care can be emotionally taxing to the patient and his/her family and presents unique medical and ethical challenges (Rak et al., 2017). End-of-life care is multifaceted and may include palliative care, psychological support, spiritual care, and medical assistance in dying (MAID). MAID is available for patients meeting specific eligibility requirements to decrease suffering from grievous and irremediable medical conditions of the right to life, liberty, and security of the person. This case of a vintage hemodialysis patient will exhibit patients' perspectives of suffering and inability to cope, demonstrate the UHN MAID process and role of an interdisciplinary team, and provide an ethical framework for decision-making during end-of-life care.

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21. La perception du Sentiment de Bien-être des Patients Recevant des Traitements d'Hémodiafiltration

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Introduction: L'hémodiafiltration (HDF) est un traitement qui associe hémodialyse et hémofiltration. Ce traitement permet de filtrer davantage de toxines urémiques que la dialyse traditionnelle. Cette association peut ainsi diminuer certains des effets négatifs de l'hémodialyse, comme l'amyloïdose. La perception du sentiment de bien-être chez les patients recevant les traitements d`HDF est peu connue ni bien documentée.

Les objectifs de la présentation: Nous présenterons les données d'une étude qualitative descriptive qui avait pour but d'exploré la perception de bienêtre des patients recevant des traitements d'hémodiafiltration.

Méthodologie: Des entrevues d'une durée de 60 minutes ont étés conduits auprès de 10 patients âgés entre 42 et 75 ans. L'échantillon comprend trois femmes et sept hommes, parmi lesquels cinq étaient francophones et cinq étaient anglophones. Ensuite, les entrevues furent transcrites et les membres de l'équipe de recherche ont analysé les données et ressorti les thèmes principaux des entrevues.

Résultats: Espoir, but de fonctionner normalement, attentes non-réalisées, croyance et destinée, et influence des soignants sur les pensées et perceptions sont les cinq thèmes principalement abordés par les participants. Un cadre conceptuel émergea de l'analyse. Il met en relation les différentes dimensions de la signification du bienêtre avec les thèmes pour illustrer les diverses perceptions et ainsi comprendre le sentiment de bienêtre chez les patients sous traitement d'HDF.

Conclusion: Les résultats de l'étude démontrent la complexité de ce sujet. Le bienêtre est multidimensionnel. Ceci indique que l'approche infirmière aux personnes recevant des traitements d'HDF doit être individualisée et la recherche doit continuer.

22. La littératie en néphrologie: une approche pour se réinventer : résultats d'une étude clinique

Julie Dupont, IPS néphrologie, M. Sc., DESS, Québec, QC

Le but de l'étude était d'évaluer le niveau de littératie en santé des patients adultes atteints d'insuffisance rénale chronique au CHU de Québec-Université Laval.

Cette étude de cohorte unicentrique transversale avait un échantillon de 353 patients : 152 en pré-dialyse, 157 en hémodialyse hospitalière, 32 en dialyse péritonéale et 12 en hémodialyse à domicile. Deux outils auto-administrés ont été utilisés : le *Brief Health Literacy Screen (BHLS)*, librement traduit et le *Health Literacy Questionaire (HLQ)* en version française validée (9 domaines de la littératie étudiés).

Selon le *BHLS*, les patients dialysés à domicile ont un niveau de littératie plus élevé comparé aux 2 autres groupes (p <0.001). Pour le *HLQ*, les patients dialysés à domicile, comparés aux autres groupes, se sentent plus soutenus et compris par les professionnels de la santé (p <0.001), évaluent mieux l'information sur leur santé (p <0.001) et la comprennent mieux leur permettant de savoir agir (p <0.001).

Les patients en dialyse à domicile ont un niveau de littératie plus élevé. La majorité de la population autochtone n'a pas pu participer à l'étude par limitation du français parlé ou écrit.

Prendre conscience du niveau de littératie des patients permettra d'adapter les interventions et le matériel d'enseignement afin de mieux répondre aux besoins des patients, d'augmenter leur capacité d'auto-soins et de favoriser l'accès à la dialyse autonome. Une attention particulière devra être apportée à la clientèle autochtone afin de cerner leur niveau de littératie et de s'adapter à leur réalité.

23. Augmenter l'accès à la dialyse péritonéale par l'ajout d'un nouveau mode d'installation des cathéters en angioradiologie: résultats d'une étude rétrospective

Julie Dupont, IPS néphrologie, M. Sc., DESS, Québec, QC

L'étude décrit les résultats cliniques et complications associés à l'installation des cathéters de dialyse péritonéale (DP) en angioradiologie au CHU de Québec-Université Laval.

Cette étude rétrospective unicentrique regroupe tous les patients ayant eu un cathéter de DP en angioradiologie entre janvier 2014 et août 2016 (n = 27). L'incidence cumulative des complications immédiates (<24h), précoces (<7 jours) et à 3 mois sont répertoriées pour les hémorragies, infections, fuites, cathéters dysfonctionnels et mal positionnés.

Aucune complication immédiate sérieuse ni hémorragie n'ont été observées. Il y a eu 4 infections de site d'émergence du cathéter. Trois patients ont fait une péritonite plus d'un mois après l'insertion du cathéter et traitées efficacement par antibiotiques. Quatre patients ont eu un mauvais positionnement du cathéter : 3 cas résolus par laxatifs et un par repositionnement en angioradiologie. Les patients ont débuté la DP un mois après l'installation du cathéter. À 3 mois, 3 patients ont eu des fuites (péri-cathéter, scrotale, pleurale). À 3 mois, 25 patients (sur 27) étaient en DP active.

L'étude démontre donc un haut taux de succès et un faible taux de complications avec l'installation des cathéters de DP en angioradiologie.

L'introduction de cette technique a probablement contribué à l'augmentation de la prévalence en DP dans notre centre passant de 60 à 70 patients. Puisque cette technique est plus économique et moins invasive que la chirurgie, elle devrait être utilisée pour l'installation des cathéters de DP chez les patients non-compliqués.

24. S'adapter à nos patients, de la littératie à l'enseignement : une avenue se conjuguant au présent et au futur pour améliorer les soins!

Julie Dupont, IPS néphrologie, M. Sc., DESS, Québec, QC

Cette présentation repose sur une revue de littérature et présente les concepts de littératie en santé dans le domaine de la néphrologie ainsi que la pédagogie de l'adulte (andragogie) dans le but d'améliorer les soins offerts aux patients par des enseignements adaptés.

Plusieurs études rapportent différents niveaux de littératie dans les diverses clientèles néphrologiques. Les concepts généraux, les données probantes en néphrologie ainsi que des pistes d'action concrètes pour inclure les concepts de littératie au quotidien seront présentés.

L'andrologie est une science comprenant plusieurs théories d'apprentissage. Certaines d'entre elles sont à la base de guides de pratique clinique pour la formation des patients en dialyse péritonéale comme celui de *l'International Society of Peritoneal Dialysis (ISPD)*. Des types et théories d'apprentissage seront exposés en lien avec les patients insuffisants rénaux en plus des nouvelles lignes directrices pour l'enseignement en dialyse péritonéale. Des outils facilement intégrables au quotidien seront aussi décrits pour déterminer les types d'apprentissage des patients.

Cliniquement, comprendre la capacité des patients à obtenir, décoder et utiliser l'information permet d'ajuster les soins pour améliorer la capacité d'auto-soins des patients. L'enseignement aux patients fait partie du quotidien des infirmièr(e)s en néphrologie. Connaître des notions d'apprentissages chez les adultes permet d'adapter le matériel et d'individualiser les méthodes d'enseignement utilisées en identifiant le type d'apprentissage des patients.

La recette du futur : s'adapter, intégrer la littératie et individualiser nos approches pour mieux répondre aux besoins des patients dans le présent.

25. Le rôle de l'eau pour l'hémodialyse

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D'hier à aujourd'hui ; l'eau utilisée pour les thérapies d'hémodialyse et d'hémodiafiltration. Au début de l'hémodialyse, on a utilisé l'eau potable de concert avec le concentré acide et bicarbonate pour fabriquer le dialysat. Au fil du temps, on s'est rendu compte que l'eau potable était inadéquate pour effectuer ces traitements. En effet, les patients devenaient malades pendant et après leurs traitements. Une relation fût faite entre l'eau utilisé et les maux des patients dialysés. Par exemple, une eau qui contenait 0,25mg/L ou plus de chlore crée l'anémie et l'hémolyse chez plusieurs patients. De même, pour l'aluminium qui est utilisé comme coagulant dans la majorité des usines d'eau potable, le seuil de toxicité est de 200 mg/L qui lorsqu'atteint, cause la « démence de dialyse ou encéphalopathie ». Néanmoins, ces 2 substances ne sont pas réglementées pour l'eau potable ou très peu. En effet, selon Santé Canada, le chlore dans les réseaux d'eaux potables au Canada est entre 0,04 mg/L et 2,0 mg/L et il n'y a pas de recommandation pour la quantité de chlore dans l'eau potable. En ce qui concerne l'aluminium, Santé Canada recommande que la moyenne annuelle soit en bas de 0,2 mg/L. Ce qui signifie qu'une municipalité peu ponctuellement utilisé de très grande quantité d'aluminium sans pour autant sortir de la recommandation de Santé Canada. Par conséquent, il y a une corrélation à faire entre la quantité d'eau utilisé dans un traitement et le besoin d'utiliser une eau de plus en plus pure. C'est la raison de privilégier les systèmes d'osmose double passe pour les traitements d'hémodiafiltration. Enfin l'utilisation d'eau purifiée a permis de diminuer la mortalité des patients qui nécessitent des traitements d'hémodialyse.

- Pourquoi?
- Comment?
- La norme de qualité d'eau à respecter aujourd'hui pour l'hémodialyse.
- La norme de qualité d'eau à respecter aujourd'hui pour l'hémodiafiltration.
  - Théorie versus réalité de la norme pour l'hémodiafiltration
  - Les étapes pour se rendre à la réalité
- Étude de cas : L'implantation d'un système de purification qui respecte les normes d'aujourd'hui quant à la qualité de construction et d'eau produite (hémodiafiltration) à l'hôpital Général de Montréal.
  - Le devis technique
    - L'évaluation des besoins
    - L'étude des normes en vigueur
    - S'informer sur les certifications détenues telles que Building Owners and Managers Association (BOMA), Leadership in Energy and Environmental Design (LEED) ou Hospitals for a Healthy Environment (H2E)
    - Observation des nouvelles tendances par exemple en Europe
    - L'art de boucher les « trous » lors de l'écriture
  - Problèmes rencontrés
    - Choix du soumissionnaire
    - Rénovations de la salle (retards)
    - Erreur d'analyse lors de la certification du nouveau système d'eau
  - Mise en route du nouveau système de traitement d'eau sur la vieille boucle de distribution d'eau comme plan de contingence après qu'il ait été certifié
  - L'installation d'un système temporaire dans la nouvelle salle d'eau rénovée afin de certifié la nouvelle boucle
  - Le transfert des générateurs de dialyse sur la nouvelle boucle
  - Le transfert du système d'eau dans la salle rénovée et son branchement sur la nouvelle boucle

26. Le rôle du technicien de Génie Biomédical en Dialyse

Léo Sauriol, Technologue en Génie Biomédical
Rachelle Stiven, Technologue en Génie Biomédical
Mohammed Amri, Technologue en Génie Biomédical, Lachine, QC

- Entretiens préventifs et correctifs des générateurs de dialyse, du système de purification d'eau et des chaises utilisées par les patients. Effectuer les entretiens correctifs des hémodialyseurs en atelier ou dans l'unité?
  - Les entretiens préventifs servent à prévenir une multitude de bris en plus de permettre une restauration des performances d'origine.
  - Les entretiens correctifs eux seront de 2 ordres, simple et complexe à solutionner. Pour les entretiens correctifs simples, nous pourrons souvent intervenir dans l'unité de dialyse entre 2 patients. Par conséquent, les entretiens correctifs complexes iront dans l'atelier. Toutes les réparations impliquant d'ouvrir le circuit hydraulique et nécessitant une désinfection s'effectueront en atelier.
    - Pourquoi?
    - Comment?

- Les entretiens préventifs…pourquoi?
- Les entretiens correctifs et préventifs du système de purification d'eau
  - Pourquoi?
  - Comment?

- Relation avec les infirmiers(ères), les préposés(es) et les patients
  - Une bonne communication est essentielle car le personnel soignant connait les patients et peuvent nous fournir d'importantes informations.
    - Fuite de sang
    - Présence d'une maladie infectieuse
    - Quel est exactement le problème qu'elles ont observé
    - De notre côté, il est primordial de tenir les infirmières et préposées au courant des problèmes qui ont un impact sur leur travail et des solutions mises en place.
  - Plusieurs fois par semaine voir par jour nous sommes appelés dans l'unité de dialyse pour répondre à diverses questions :
    - Que signifie cette alarme qui est affiché sur l'hémodialyseurs?
      - Fuites
      - Erreurs de débit
    - Module BVM (blood volume monitoring) qui ne démarre pas
    - Module de pression artérielle qui reste grisé et ne prend aucune pression artérielle
    - Fonctionnalités possibles des hémodialyseur
    - Communication du logiciel de collection de données patients (pression artérielles, concentrés, temps de traitements,…)
  - Dans le cas des patients, il faut être à l'écoute et expliquer ce qu'on fait lorsqu'on travail près d'eux ou s'ils nous le demande.
- Acquisition de matériels
  - Recherches afin d'obtenir la meilleure proposition qui comble le besoin au meilleur prix
- Renouvellement des équipements
  - Faire connaître les besoins de renouvellement des équipements (désuétudes, bris fréquents et autres raisons)
  - De concert avec l'ingénieur Biomédical ou le Spécialiste
    - Écrire le devis technique
    - Évaluer les soumissions reçues
    - Répondre aux questions techniques des soumissionnaires reçues lors d'appel d'offre Telle que pourquoi vous avez demandé l'hémodiafiltration? Ou pourquoi vous demandez la capacité néonatal? Ou pourquoi vous avez demandé l'amorçage en ligne? Ou pourquoi vous avez demandé des roues d'une grandeur minimum?

27. Can Nursing Procedures Have an Influence on Improved Anemia Control?

Maria-Teresa Parisotto, RN, Bad Homburg, Germany

Introduction: Most patients who require hemodialysis have a variety of serious health problems, one of them anemia, a common complication of both renal failure and hemodialysis. Dietary restrictions and poor absorption or removal of iron and vitamins by hemodialysis can contribute to anemia. The hemodialysis procedure itself leads to a loss of 300 to 600 grams of hemoglobin (Hb) per year due to blood retention in the dialysis lines and filters.

Objectives: To maintain an adequate level of hemoglobin and a high quality of care by optimizing the blood reinfusion at the end of treatment.

Methods: 840 hemodialysis patients were followed up from December 2011 to September 2013. Results on hemoglobin level and erythropoiesis stimulating agents (ESA) consumption were compared before and after the blood reinfusion optimization.

Results: At baseline (December 2011), with ESA and iron doses of 1.87 ± 1.87 mcg/kg/month, 2.21 ± 2.42 mg/kg/month, respectively, the hemoglobin level was 11.25 ± 1.24 g/dL. In December 2012, with ESA and iron doses of 1.21 ± 1.31 mcg/kg/month and 3.18 ± 2.17 mg/kg/month, respectively, the hemoglobin level was 11.34 ± 1.22 g/dL. In September 2013, with ESA and iron doses of 1.39 ± 1.43 mcg/kg/month and 1.98 ± 2.13 mg/kg/month, respectively, the hemoglobin level was 11.22 ± 1.18 g/dL (p=0.57 NS).

Conclusion: The analysis demonstrated that, by performing a proper reinfusion procedure, it is possible to reduce the quantity of residual blood in the extracorporeal circuit, thereby reducing anemia risks and increasing safety while optimizing costs.

28. Creating Meaningful Experiences for Grieving Family Members in Adult Critical Care Areas

Wendy Sherry, Nurse Clinician, Montreal, QC

Hospital end-of-life care (EOL) rituals and the creation of keepsakes are often completed in neonatal and pediatric critical care units (Kobler, Limbo, & Kavanaugh, 2007). However, EOL needs in adult critical care units are scarce despite the 2001 recommendations by the Society of Critical Medicine (Troug, et al., 2001). At the MUHC, the nurse clinicians for organ and tissue donation create keepsakes through interactive family activities such as making handprints, drawing pictures, writing letters/poems, etc. The presentation will demonstrate a need for research on EOL care practices in adult critical care units as anecdotal evidence demonstrates a positive effect on the grieving process. Utilizing Wright and Bell's Belief and Illness Model (2009), cultural values, religious beliefs and family needs are explored in order to develop tailored therapeutic interventions to create a meaningful bedside experience for family members.

Presentation Objectives

1. To provide an overview of MUHC Nurse Clinician Organ & Tissue Donation EOL bedside practices
2. To compare current adult critical care EOL care standards with the interactive family activities practised by nurses working in organ and tissue donation
3. To promote reflection on the usual standard of adult EOL care in critical care areas

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29. Supporting Culturally Diverse Families Involved in the Deceased Donation Process

Wendy Sherry, Nurse Clinician, Montreal, QC

Many people assume they are culturally sensitive because they are polite and respectful to people with different ethno-cultural backgrounds; or they get along well at work with colleagues who are members of a different ethno-cultural community. However, providing culturally congruent care to patients and families with diverse cultural backgrounds and who are involved in the deceased organ and tissue donation (OTD) process can be challenging (Guido, et al., 2009; Høye & Severinsson, 2008; Pearson et al., 2001). In 2010, the Expert Panel on Global Nursing created a set of universal transcultural standards to guide nursing care practice. These standards, Leininger's (1988) Theory of Culture Care Diversity and Universality, discussions with members of key ethno-cultural communities, nurses, and expert clinicians in the field of OTD, informed the creation of a nursing resource manual for critical care nurses caring for culturally diverse families involved in the OTD process. Participants' cultural self-knowledge will be evaluated with a self-assessment checklist (available in English and French), and the contents of the critical care nursing resource manual will be presented. The manual was created in partial fulfilment of a graduate degree in nursing (Sherry, 2014).

Synopsis: The objective of this workshop is to promote reflection of cultural awareness and to demonstrate how nursing care is impacted when supporting culturally diverse families involved in the deceased organ and tissue donation process. A review of the developed nursing resource manual for critical care nurses caring for ethno-cultural families involved in the donation process will be presented. In addition, a checklist designed to measure cultural competence (English and French) will be provided to promote discussion.

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30. Clinical Outcomes of Home Hemodialysis with Low Dialysate Volume

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Eric Weinhandl, Clinical Epidemiologist and Statistician, NxStage Medical, Inc.

Purpose: The Canadian Agency for Drugs and Technologies in Health recommends self-care home-based dialysis in patients diagnosed with end-stage kidney disease, either with home hemodialysis (HHD) or peritoneal dialysis. We evaluated outcomes on HHD with a transportable device that employs low dialysate volume (LDV).

Methods: We collected data from HHD patients at nine centres in Western Europe. We recorded hemodialysis prescription, biochemical, and medication data at HHD initiation, and at six and 12 months thereafter.

Results: The cohort comprised 182 patients. Ranges of age, body mass index, and Charlson score were 15 to 84 years, 13.3–50.8 kg/m^2, and 2–11 points, respectively. Mean training duration was 18.9 sessions. Most (93.4%) patients were prescribed five or six sessions/week, and session duration was commonly 2.0–3.5 hours; mean dialysate volume was 23.9 L/session. Mean ultrafiltration (UFR) rate declined from 6.9 to 6.6 mL/hour/kg between HHD initiation and 12 months, with a halving of patients with UFR ≥10 mL/hour/kg. Mean standardized *Kt/V* was 2.6 at all times; the majority of patients had standardized *Kt/V* between 2.4 and 3.0 at 12 months. Serum concentrations of bicarbonate, potassium, calcium, phosphorus, albumin, and hemoglobin were stable. The percentage of patients using no antihypertensive medications steadily increased from 27% at HHD initiation to 36% at six months and 42% at 12 months.

Conclusions: HHD with LDV is viable for a wide array of patients. Increased treatment frequency, low ultrafiltration intensity, stable biochemistry, and reduced medication use are observed.

Implications: HHD with LDV presents features likely to lead to better clinical outcomes.

31. Conservative Kidney Management: An Alternative Care Pathway to Dialysis

Betty Ann Wasylynuk, BScN, RN
Janice McKenzie, MScN, RN
Sara N. Davison, MD, MSc, Edmonton, AB

The prevalence of advanced chronic kidney disease for patients 75 years and older continues to climb worldwide with dialysis often being the default modality option. Unfortunately, many of these older patients suffer from functional disability, cognitive impairment, and/or high levels of comorbidity, and dialysis may not provide them with either a survival or quality of life advantage. Alberta's Kidney Health Strategic Clinical Network™ (KHSCN) strives to optimize kidney care and outcomes across all ages and stages of kidney health. As a result, in partnership with the KHSCN, and using state of the art implementation science, we developed a provincial Conservative Kidney Management (CKM) pathway aimed at providing sustainable, high-quality and evidence-based care for patients who are unlikely to benefit from dialysis and have chosen a conservative approach to care. The purpose of this presentation will be to describe Alberta's CKM pathway: its purpose, development, implementation, and evaluation, including feedback from CKM patients and renal staff providing CKM care. Lastly, participants will receive a guided tour of the publicly accessible and interactive CKM website (www.ckmcare.com). Upon completion of the presentation, participants will learn that CKM is an alternative care pathway for patients who are unlikely to benefit from dialysis.

32. Are We There Yet... Challenges of Transition to Adult Care

Paule Comtois, BScN, Montréal, QC

According to the Canadian Pediatric Society, 15% of youth in North America have a chronic condition. Although there has been active research on the transition to adult care in the past 20 years that has contributed to better understanding of the transition process, the search for improvements in this process continues. Clinicians continue to strive to achieve a process that minimizes the time and resources required for effective transition from the pediatric to the adult environment. The real challenge, however, remains fostering independence in these young adults in order for them to assume responsibility for their care at large. Chronic illness should not deter these patients from becoming young adults who have fulfilling lives and control over their illness.

In this presentation, we will explore the barriers to transition to adult care, and the impact it has on the family and the care team at large (pediatric and adult). Different transition models have been developed to support these teenagers acquiring milestones required to become responsible for their health such as pediatric transition clinics, joint adult-pediatric transition clinics, or a novel approach utilizing technology and long-term follow-up for young adults.

The challenge lies in what approach to take with these patients, as a one-size-fits-all approach may not address their unique needs.

This presentation underscores the importance of the pediatric and adult care team and family members working closely together toward the common goal of a successful transition for our patients.

Let's make it happen.

33. Le donneur vivant non compatible: quelles sont les options?

Liane Dumais, IPSN, M. Sc., D.E.S.S., Québec, QC

Pour une majorité des personnes qui souffrent d'insuffisantes rénales chroniques au stade terminal de la maladie, la greffe rénale est le mode de suppléance qui améliore considérablement leur qualité de vie.

Selon la littérature, la transplantation rénale à partir d'un donneur vivant présente de nombreux avantages dont la diminution de la durée d'attente pour un rein, la possibilité d'une greffe préemptive afin d'éviter la dialyse et un meilleur fonctionnement et survie du greffon. En outre, la promotion du don vivant s'inscrit dans une volonté provinciale d'augmenter le nombre de transplantation en provenance de ce type de donneur. (Projet don vivant de rein, Ministère de la santé et des services sociaux, 2016). Quelles sont les options du receveur lorsque le donneur vivant potentiel qui s'est manifesté est incompatible?

Cette présentation abordera les thèmes suivants afin de d'informer et de sensibiliser les infirmières en regard des options possibles, qui à son tour pourra renseigner le receveur et ses proches:

- L'augmentation de la sensibilité des techniques d'identification des anticorps
- Le test de compatibilité croisé virtuel (« cross match virtuel »)
- Les antigènes permis en présence d'anticorps pour faciliter l'accès à la transplantation chez les receveurs sensibilisés
- La greffe ABO incompatible et la désensibilisation HLA
- Le programme canadien de « don croisé de rein ».

L'infirmièr(e) en néphrologie pourra ensuite renseigner le receveur.

Oral and Poster Presentations

1. Creating an Opportunity to Improve Outcomes through a Joint Initiative to Develop a Standardized Preceptor/Mentor Workshop for Hemodialysis (HD) Nurses

Lezlie Lambert-Burd, B.Ad.Ed, BScN, RN, CNeph(C), St. Catharines, ON

Can a joint initiative between two partner organizations develop a standard learning opportunity for HD nurses that will improve outcomes for mentors and mentees?

The literature shows that a successful orientation has the capacity to empower nurses, increase retention rates, ensure patient safety, and improve positive patient outcomes (Bally, 2007). Training for preceptors or mentors will support and improve instruction and confidence during orientation for both the preceptor and preceptee (Squillaci, 2015). Furthermore, effective orientation may increase overall job satisfaction, thus improving retention and, ultimately, reducing program costs (Grindel, 2004).

An opportunity was seized, and an integrated project to develop and deliver a preceptor to mentor full-day workshop for HD nurses at both partner organizations using a standardized approach was achieved. The aim was to provide nurse preceptors/ mentors with the opportunity to cultivate their knowledge, skills, and attitudes/abilities to support new learners and further develop a toolbox of usable resources to support knowledge translation in their preceptor roles. A priority goal was to utilize the RNAO Practice Education in Nursing (2016) in the development and implementation of the preceptor/ mentor workshop.

Data were captured at both pre and post workshop with a follow-up survey at six months to assess the impact and implementation of new knowledge into practice. Data demonstrated measurable improvement with learning outcomes and staff satisfaction with an integrated workshop experience.

Creating an opportunity for professional development within a program may positively impact healthcare organizations, cultivate collegial learning environments, and ultimately improve nursing care.

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2. Interprofessional Shadowing Between the Hemodialysis Unit and Laboratory

Billie Hilborn, MHSc, BScN, RN, CNeph(C)
Jhanvi Solanki, MScN, MBA, RN
Elizabeth McLaney, BA, MEd, BScOT, OT Reg. (Ont)
Anne Marie Phillips, BSc, ART (Hematology), MLT
Neil Lund-Walker, MLA,
Irene Alao, BScN, RN
Melissa Adamson, BScN, RN, Toronto ON

Successful collaborative practice between disciplines relies on quality working relationships (Laflamme, 2017). The purpose of this project was to foster high quality, person-centred care by learning together across professions. The two main goals included enhancing the culture of collaboration and interprofessional competencies between the laboratories and nursing with attention to role clarification and interprofessional conflict resolution while supporting ongoing quality improvement.

A shadowing experience was designed for nursing and laboratory services in four dyad pairs, with one pair being from Specimen Management in the lab and the hemodialysis unit. One member from each department spent 2.5 hours shadowing in the other department. Sets of questions were prepared for participant reflection before, during, and after the shadowing experience.

Anticipated outcomes included improved ability for dyads to describe common work flow tasks and priorities, identify challenges and competing demands for their partner's profession, and relate the impact of their profession's work on their partners. This will improve existing relationships and promote interprofessional collaboration between the laboratories and hemodialysis unit.

Implications for Nephrology Practice/Education:

When collaboration between the laboratories and hemodialysis unit is not optimal, there can be negative impact on patient experience such as having repeated specimens drawn for testing, inefficiencies due to repeating work processes and reporting of critical results, wasted resources such as test tubes and reagents, and siloed work that limits improvement opportunities. This project will hopefully promote a positive impact.

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Poster Presentations

1. Role of the Regional Resource Nurse From Teacher to Mentor

Mary Touzel, RN, CNeph(C), London, ON

There are many facets to the Regional Resource Nurse role. We are highly involved with all aspects of mentoring due to the distance locations of our satellites. We teach, empower, and develop critical thinking skills within our satellite units from the novice to the experienced nurse.

This presentation will utilize a poster display board reflecting how we utilize different teaching styles to suit the learner's needs especially in the changing hospital environment. By sharing my experience, I hope to help other hemodialysis units overcome teaching hurdles and help ensure student success.

Objectives:

1. Distinguish between different learning styles
2. Distinguish pros & cons of being a novice nurse
3. Distinguish pros & cons of being an experienced nurse
4. Identify education process for RN and RPN
5. Continuing education within satellite units
6. Comparison of students with or without simulation experience.

2. Addressing Healthcare Gaps: The Person-Centred Decision-Making Initiative

Elizabeth Carmelina del Rosso, BA, Honours Psychology, Kitchener, ON

Purpose: To provide an overview of the development and implementation of the Person-Centred Decision-Making (PCDM) initiative, in Grand River Hospital's Renal Program.

Description: PCDM conversations ensure that patients receive treatment in accordance with their values, wishes, and goals. Unfortunately, data show that PCDM conversations often do not take place, or occur late in a patient's illness trajectory, essentially compromising the standard of care received.

In 2017, the Nephrology department at Grand River Hospital established an interdisciplinary team responsible for the implementation of PCDM conversations into routine care. Briefly, this process included: (1) each patient identifying a Substitute Decision-Maker(s) (SDM); (2) healthcare providers prompting interaction regarding patient values and Goals of Care (GOC) in alignment with the Plan of Care (POC); and (3) obtaining informed consent from patients for treatment decisions.

Evaluations/Outcomes: Qualitative and quantitative data from the development and implementation processes of this initiative will be discussed.

Implications: Incorporating PCDM conversations into routine care will ensure that patients are better equipped to make decisions about their healthcare and that healthcare providers are delivering a higher standard of care.

3. Improved Identification of Hemodialysis Patients at Risk for Falls to Increase Preventative Action Strategies and Patient Safety

Anuradha Sawant, PhD, PT
Sarah Spence, MN, NP-PHC
Trisha Slinger, BScN, BAHons, RN, CMSN(C), London, ON

Purpose: To compare the Renal Fall Risk Assessment Tool (RFRAT), an evidence-based fall risk assessment tool developed for people on maintenance hemodialysis (HD), to the Morse Fall Scale (MFS) that is currently used in the outpatient HD units at London Health Science Centre (LHSC) in London, Ontario.

Method: The RFRAT and MFS were administered by RNs to participants on HD at the University Hospital (UH) HD Unit**.** The total scores were compared using a one-sample *t* test.

Results: The RFRAT was completed on 28 participants (n=28). The MFS was completed on 25 of the same participants. The results indicate seven of the 28 participants who were rated at "no risk" or "low risk" for falls on the MFS were either "at risk" or "medium risk" for falls on the RFRAT. The MFS (mean [*M*] = 2.8, standard deviation (*SD*) = 2.1, n = 25) and RFRAT (*M* = 9.5, *SD* = 2.7, n = 28) scores were significantly different ($p<0.001$).

Conclusion: The RFRAT is more likely to detect subtle changes in the mobility of people on HD and identify the risk for falls more accurately than the MFS.

Implications: The RFRAT is more sensitive to detect falls in people on HD and should be routinely used to identify people at risk for falls in LHSC's HD units. Improving fall risk assessments can lead to increased use of appropriate fall prevention services.

4. Vascular Access Link Nurse's Initiative: A Bold Commitment With Exemplary Results

Bincy Varghese, BSN, RN, CNeph(C)
Maricar Vergara, RN, Surrey, BC

Depending on one's outlook, experience is, indeed, the best coach in life.

In 2016, the Link Nurses group was formed by 10 frontline staff to mitigate the lack of having a vascular access RN on site. The primary aim was to promote a common understanding in the care and management of arteriovenous fistulas and grafts.

The endeavour has proven to be of vital significance in addressing commonly encountered issues in the unit and in influencing the way our staff treat a patient's lifeline. In 2017, an additional 25 frontline staff found inspiration with the achievements of the first group and, thus, voluntarily committed themselves to learn from each other's experiences to enrich their knowledge, harness valuable skills, and improve the overall perception of and approach to vascular access-related issues.

To promote active participation, each member was asked to select a topic to research on and to share their findings through weekly meetings, which eventually facilitated the presentations of current access-related issues. The theoretical and practical components of vascular access care (including sonography) were covered within a span of one year. Opportunities to practise on ultrasound guided-cannulation and access mapping were provided with the support of pioneer vascular link nurses.

Overall, the group has gained the respect and recognition from patients and their families, the multidisciplinary team, and other members of the healthcare team in different units within Fraser Health.

5. Prevalence of Cardiac Events in Patients With Chronic Kidney Disease

Leonor Cercena, BScN, RN, Montreal, QC

Purpose: To determine the prevalence of previous or current cardiac events in patients with chronic kidney disease (CKD) as this is a common cause of mortality in those patients.

Methods: This retrospective study included 199 patients (118 males and 81 females, mean age 64, range 26 to 95 years) with CKD currently on dialysis in our institution. We looked at these patients' charts for prior history of cardiac events as defined by previous hospitalization with a discharge diagnosis of myocardial infarction or previous elevation of troponin levels. We also looked at the presence or absence of diabetes.

Results: Eighty-six (43.2%) of the 199 patients had prior cardiac events. One hundred seven patients (53.8%) had diabetes. The study indicated that 53 patients with diabetes of 107 (49.5%) had prior cardiac events. Among those without diabetes, 33 of 92 (35.9%) had prior cardiac events.

Conclusion: A substantial proportion of patients with CKD, particularly if they have diabetes, on hemodialysis had a cardiac event in our study population. Our study suggests that these patients are at high risk for future cardiac events.

Implications for Nephrology Care: Patients with CKD should be screened for coronary artery disease. They should be encouraged to implement a lifestyle including exercise and diet to reduce the risk of future cardiac events.

6. Enhanced Sliding Short Axis (ESSAX) Technique: An Innovation for a 100% Cannulation Accuracy

Neil A. Penalosa, BSN(Ph), RN, CNeph(C), Surrey, BC

Precision with needle placement has been a long-standing challenge. With conventional assessment, nursing skills are limited to creating merely an impression or an imagination of the depth, size, and direction of the vein.

The Enhanced Sliding Short Axis (ESSAX) technique is an ultrasound-guided method that facilitates monitoring of the needle tip, upon insertion into the arterio-venous fistula or graft. ESSAX had revolutionized the way we carry out cannulation, as we treat each vascular lifeline with great importance and respect. The innovation was conceived with the earnest desire to resolve the dilemma on miscannulation.

7. NephroTalk: an Interdepartmental Nursing Communication Tool

Michelle Brazier, BScN, RN, CNeph(C)
Anne Pilon, BScN
Elizabeth Carvalho, RN, CNeph(C), Montreal, QC

NephroTalk is an interdepartmental nursing communication tool developed to provide the admitted dialysis patient with a safe transfer of care between the inpatient units and the dialysis department.

The Registered Nurses' Association of Ontario (RNAO) Best Practice Guidelines (2014) stipulate that using streamlined and standardized communication tools will ensure a clear and accurate transfer of care, and prevent omission or duplication of critical information. Furthermore, effective communication is fundamental to the safety and the quality of services rendered within the care continuum. A patient handoff must occur each time there is a nurse or patient transition, and must occur in a structured and formal process.

According to recent literature, 80% of serious medical errors involve miscommunication during the hand-off (Starmer et al., 2014; Huang et al., 2010). Thus, clear and accurate communication regarding the patients' condition is essential for safe continuity of care.

Our poster will detail the communication tool and its three segments, the purpose, and implications of nephrology practice, as well as describe the collaborative method demonstrated during the introductory process of the tool in the clinical setting.

Lastly, we will present the evolution of this initiative and future plans to evaluate its effectiveness, with hopes to standardize this practice across our organization, the centre intégré universitaire de santé et de services sociaux de l'Ouest-de-l'île-de-Montréal (CIUSSS ODIM).

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8. Visual Education—CVAD (Central Venous Access Device) Video

Linda M. Mills, RN, CNeph(C)
Kelly Sutherland, RN, CNeph(C), Hamilton, ON

The overall purpose of our project was to decrease or maintain the low catheter-related blood stream infection (CRBSI) rates in our hemodialysis population. Our regional program encompasses 521 hemodialysis (HD) patients across four different sites. One hundred and fifty-two nursing staff access 282 CVADs routinely.

Given such a large group of staff, our goal was to identify the educational need related to CVAD care and create an educational tool that was easily accessible without the need for face-to-face education.

An audit tool was developed to assess current practice, and random audits were performed. The evaluation indicated gaps in practice. Educational videos focusing on policy review and updates grounded in recent evidence were developed. Practice points that prevent contamination during initiation and discontinuation procedures were emphasized. Once complete, staff were instructed to review the videos and complete a short post-test to indicate completion and new learning.

Post education audits were held in February 2018. A review of both adherence to policy and actual CRBSI rates four months prior and four months post education were examined.

The result is a self-directed, timely, accessible, and efficient method of providing education to a large group of both new and experienced nurses in multiple practice settings to positively impact patient clinical outcomes. This education provided in a visual and auditory format supports adult learning needs and can provide a more effective use of resources to provide education. With proven success, next steps include further educational video development.

9. Enhancing Quality of Life: Advance Care Planning for Patients with End-Stage Renal Disease

Jennifer Nguyen, BScN, RN, Brampton, ON

The purpose of this quality improvement (QI) project is to initiate and implement Advance Care Planning (ACP) for patients with end-stage renal disease (ESRD) who are currently receiving hemodialysis (HD) treatments at the Toronto General Hospital (TGH). In order to implement this QI project, it is also imperative to educate the healthcare staff to increase their knowledge and comfort level in having the ACP conversations with their patients. This QI project was started by conducting a pre-survey to the hemodialysis staff at TGH to determine the knowledge and comfort level of the HD nurses on the topic of ACP.

ACP is a process in which individuals make decisions about the care they would want to receive if they become unable to speak for themselves (Brinkman-Stoppelenburg, Rietjens, & Van der Heide, 2014). It is a way for these patients to document their wishes for end-of-life care, and will greatly comfort them and their caregivers, knowing that their wishes will be respected. ACP also includes individuals having a discussion about their personal values with their loved ones and designating their power of attorney/substitute decision maker.

Life is unpredictable, therefore it is crucial for one to think and share what is important to them. From September 2017 to the present, education and awareness have been ongoing for patients and staff through educational tools such as in-services, meetings, newsletters, posters, and informational brochures. This project will then be sustained and become part of the admission process when new patients start HD treatments (including kardex rounds) and align with the Ontario Renal Network's mandate for ACP.

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10. Clinical Use of a Body Composition Monitor to Establish and Troubleshoot Ideal Body Weight in Hemodialysis Patients

Christine Morton, BScN, RN, CNEPH(UK)(NI), Toronto ON

This presentation looks at the body composition monitor (BCM) at St. Michael's Hospital, as a beneficial tool in helping to optimize the ideal body weight targets for our patient population in hemodialysis. Optimal volume control can be elusive and is in need of more precision. We focused on two groups of patients: incident patients and those with hard to determine fluctuation in body weight. A routine BCM testing schedule was established for new patients on hemodialysis to accurately establish their target weight in the initial three months on HD, typically a time when there are weight and also potential over-hydration issues. The second group included HD patients whose ideal body weights

were difficult to determine due to other comorbidities.

Hemodialysis nurses at St. Michael's Hospital have been managing BCM testing for both groups of patients, which included data interpretation. Results show a smooth transition onto dialysis and helpful advantage when it comes to targeting the ideal body weight for our patients. Implications for nephrology care are significant. Establishing accurate ideal body weight is, by its nature, a moving target that greatly impacts the health and quality of life for patients on hemodialysis. BCM is an important tool that provides information to the physician and multidisciplinary team about a patient's ideal target weight. Routine testing of body composition enables the healthcare team to monitor the accuracy of the target weight and provide a high-quality fluid management strategy.

11. Development and Implementation of a Hemodialysis Unit in a Rehab/Complex Care Setting

Lisa Wolfs, MPH, BScN, RN
Joanne Lawnicak, RN
Julia Gordon, RPN, London, ON

Purpose: The purpose of this presentation is to describe the unique planning, development and implementation of a hemodialysis (HD) service at St Joseph's Health Care, Parkwood Institute in cooperation with London Health Sciences Centre (LHSC) for patients currently requiring travel to and from hospital sites. This project was informed and implemented in cooperation with patients and families receiving care through the renal program.

Description: LHSC's dialysis units currently provide HD treatments to inpatients from Parkwood Institute, a neighbouring rehabilitative and long-term care facility. The total number of trips between LHSC and Parkwood Institute is significant in numbers and costs, and has a significant effect on a patient's quality of life.

Undergoing HD treatments can affect a patient's energy level, which, in turn, can affect their ability to fully participate and complete rehabilitative therapies. Travelling to and from hospital sites for HD can further contribute to a patient's fatigue levels, making it challenging for them to achieve their goals for rehabilitation and recovery.

Evaluation/Outcomes: The goal of this project is to create efficiency and reduce travel costs, improve the patient experience and satisfaction through the reduction of transportation from site to site, and improve patient outcomes in terms of their rehabilitative goals at Parkwood Institute. A formal evaluation of this service is planned.

Implications: The implications of this project are universal to all renal care centres across Canada experiencing similar challenges with providing efficient, cost effective and patient-centred care resulting in inter-facility travel for HD.

12. Technological Advancements in APD With Remote Patient Monitoring and User-Friendly Peritoneal Dialysis Cycler: Impact on Patient Confidence and Clinical Decision-Making

Arden Gibson, RN, St. Catharines, ON

Home therapy dialysis options for patients living with chronic kidney disease (CKD) in Canada have recently experienced great enhancements using new technology. Our program recently adopted a new ADP cycler that provides home patients with a user-friendly, step-by-step experience. This cycler comes with a two-way web-based remote monitoring connection between the patient and the clinic.

This poster will describe two case studies of patients who have utilized this new PD technology. The new technology uses two-way web-based remote monitoring to provide data from daily treatments to the PD clinic. Clinic staff can view all aspects of patient treatments and make changes to therapy remotely. The device is also voice-guided, and provides step-by-step animated guidance for therapy set-up and alarm conditions.

Patients express their satisfaction and increased confidence with the improved simplicity, ease of use, and enhanced comfort level in knowing a nurse can observe their daily treatment and intervene if issues arise.

Hospital PD programs receive information allowing them to observe data and make prescription changes when required and in a timely manner. This timely availability of information allows for more informed clinical decision-making. In addition, training time of community nurses supporting PD patients has decreased.

13. Supporting Best Practice Dialysis Through the Case Management Model

Janett Black, MHS, BScN, RN, CNeph(C), Alliston, ON
Serena Chan, BN, RN, CNephC, Toronto, ON

The lack of integrated frameworks and a systematic approach to patient care delivery has resulted in inconsistent patient care in many organizations. Hemodialysis (HD) programs require processes and care delivery models reflective of patient and family engagement through self-management, care continuity, and collaborative partnerships, to ensure continuous improvement and positive care outcomes. The Case Management (CM) model was introduced at Scarborough and Rouge Hospital's (SRH) Regional HD program in response to an identified need to improve patient and family engagement and self-management as partners in their care, and the need to establish consistency and standardization in the delivery of dialysis best practices and care among our patients on HD.

The overall goals of the implementation of the CM model were to:

- Improve patient engagement and partnership through patient identified goal-setting and self-management practices
- Sustain consistency in best practice and standards of HD care
- Improve staff accountability for patient care through interprofessional collaboration and peer mentorship.

Evaluation of the CM model demonstrated:

- Significant improvement in nurses' adherence to completing CM deliverables in support of the CM goals
- Improvements in patient and family engagement and motivation towards patient-directed goal-setting and goal attainment
- Improvement in staff satisfaction related to practice and performance.

The program's experiences in the development and implementation of this model provides proof of concept and demonstrated successes that can be adopted in other HD or health service programs.

14. A First User Experience of New Remote Monitoring Technology in Peritoneal Dialysis—Leveraging Timely Sharesource Data to Effectively Manage Patients at Home and Ease Their Transition Into PD

Karen Eyolfson, RN, CNeph(C)
Kim Bomak, BSN, RN, Winnipeg, MB

There are many considerations and steps involved when starting a patient on peritoneal dialysis. A few big considerations include smoothening the transition, increasing patience confidence in self-management of disease, and effectively troubleshooting any clinical or technique issues through the first three months on PD.

Our program was the first in Manitoba to evaluate a new technology in APD cyclers that allows for two-way web-based remote monitoring connection between the patient and the clinic. This remote monitoring software allows for daily overview of patients' treatments to be visible to the clinic, flag alerts when deviation occurs to the prescribed treatment regime, and for remote patient cycler programming.

Currently we have approximately 12 patients on PD using this new cycler. The initial experience that we would like to outline include: increased visibility to treatment data, timely identification of potential problems such as low drain alerts, and effective troubleshooting of issues by leveraging the Sharesource data.

The poster will also include some case studies showing the benefits of Sharesource in effectively managing patients at home and easing their transition to PD.

15. Renal-Friendly Interactive Cooking Demonstration for Hemodialysis Patients

Kelly Gardner, RD, CDE
Rommana Captain, RD, CDE
Allyson Babb, RD, CDE
Yassamin Gharai, RD, CDE
Queenie Cheung, RD, CDE, Oshawa, ON

Description: Hemodialysis patients face many dietary restrictions, and are often challenged with preparing meals that are safe and meet their dietary needs. Additional barriers that they encounter are financial and time constraints due to regular dialysis treatments. As a result, they often rely on processed/premade meals, which are high in sodium and/or phosphorus. The aim of a renal-friendly cooking demonstration is to help increase patients' confidence in managing a renal diet. This class is two hours in length, and includes an interactive cooking demonstration of a three-course meal led by a chef and an optional 30-minute RD-led grocery store tour, which focuses on reading nutritional information on labels. Participants enjoy the meal together and are able to ask questions to the chef and Registered Dietitians (RDs). The recipes are chosen by the chef, given the dietary restrictions (low phosphorus, low sodium), and approved by the RDs. The RDs provide additional food substitution suggestions throughout the class to accommodate high or

low potassium diets. This initiative is sponsored by industry donors. With a minimal cost to attend (in order to ensure attendance), the money collected is used to purchase door prizes, such as renal cookbooks and grocery store gift cards.

Results: Thirteen hemodialysis patients and six family members/care providers attended. Participants completed an anonymous post-class evaluation. All participants indicated the class was "helpful" or "useful" or "somewhat useful", and that the information was "easy to understand." Almost all participants agreed that it helped them increase their confidence in managing the renal diet. The RDs who attended felt it improved the collaborative relationship with the patients, especially to have contact in a non-clinical setting, and helped foster a sense of community within the hemodialysis unit.

Next steps: Engage patients by having them select and approve recipes prior to class.

16. Clinical Effectiveness and Safety Of 4% Tetrasodium EDTA as a Routine Non-Antibiotic Antimicrobial Lock Solution in Central Venous Access Devices Of Hemodialysis Patients Against the Triplethreat™: A 15-Month Canadian Experience

Chantal Lainesse, DVM, PhD, DACVCP, Markham, ON
Karen Kelln, CEO SterileCare

Introduction: The ideal catheter lock solution should be able to prevent the occurrence of the TripleThreat™ of clot, bacterial colonization, and biofilm. Providing an effective barrier for the inside of central venous access devices (CVADs) must be part of the multimodal approach to decrease the risk of catheter-related complications such as catheter-related bloodstream infections (CRBSI) and occlusions. However, this lock solution **should not** contribute to increasing the risk of antimicrobial resistance (AMR), higher catheter maintenance cost, and/or bleeding episodes. The *in vitro* effectiveness of a novel non-antibiotic antimicrobial solution of 4% tetrasodium ethylene diamine tetraacetic acid (T-EDTA) was confirmed against biofilms formed by clinically relevant bacteria and fungi. The anticoagulant property of EDTA is well known and trusted. Therefore, the objective was to collect post approval safety and efficacy data from the use of this T-EDTA catheter lock solution in Canadian hemodialysis patients compared to the standard of care.

Methods: Hemodialysis patients were selected across Canada based on their (high, medium or low) risk of CRBSI and alteplase use. Clinical endpoints included reduction of alteplase use, CRBSI, and safety. A return on investment (ROI) model was also used to evaluate cost effectiveness of T-EDTA.

Results: Canadian data collected over the last 15 months show both a clinically relevant decrease in CRBSI and alteplase use when the standard lock solution was replaced by 4% T-EDTA. The ROI model also detected a cost saving in favour of T-EDTA. No hypocalcemia was reported.

Discussion/Conclusion: Results highlight the ability of 4% T-EDTA to reduce bacterial burden and biofilms in CVADs as well as provide well-established anticoagulant activities by significantly reducing the use of alteplase. T-EDTA is a safe and effective catheter lock solution for hemodialysis patients offering cost savings.

17. Evaluating Expanded Hemodialysis (HDx) Therapy in Comparison to Conventional HD Therapy in Clinical and Patient Outcomes Aspects

Sandra Lagacé, Resource Nurse, CNeph(C)
Chantal Leblanc, RN, Moncton, NB

Learning objectives:
1. Review middle large molecules clearance and its importance.
2. Discuss six-month evaluation of HDx therapy at Dr. Georges L. Dumont Hospital.
3. Review the results and the implications of HDx therapy on clinical outcomes.

Uremic solutes include middle-large molecules (MMs) that are poorly removed by conventional high-flux hemodialysis (HD) due to their size (> 15 kiloDaltons [kDa]). Such solutes are associated with inflammation and immune system disorders, as well as poor outcomes in dialysis patients (Assi et al., 2015; Hutchinson et al., 2014; Cohen et al., 1995; Cohen et al., 2001; Desjardins et al., 2013).

Recently, expanded hemodialysis (HDx) therapy has been introduced to the market. This therapy uses the medium cut-off membrane, which has greater effective pore sizes than conventional high-flux membranes, allowing permeability closer to the natural kidney's glomerular membrane and middle-large molecule removal.

The presentation will cover the unmet need of middle-large molecules clearance using a conventional HD treatment, the new HDx technology introduction at Dr. Georges L. Dumont Hospital, and its evaluation on 10 patients for six months. We will review the methods and results, and share our conclusions comparing HDx therapy to conventional HD.

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18. Electronic Medical Record for the Renal Program—The Road to Success

Michelle Hughes, RN
Krista Lovering, MBA, BScN, RN
Lisa Dale, Project Manager, Orillia, ON

Introduction: The Regional Simcoe Muskoka Kidney Care Program endeavoured to achieve a standardized, computerized patient information system across the program that could support patients throughout their CKD journey from the Multi-Care Kidney Clinic (MCKC) to their chosen modality at home, or at any of the six in-facility sites.

Purpose: To achieve a computerized documentation system that is fully integrated throughout the RSMKCP that would ensure that all care teams could coordinate and access the most up-to-date information in the patients' chart in real time.

Method: A phased approach to "go-live" was decided upon to support staff training. Our team incorporated computerized documentation across the program, including connecting and sharing information with different hospital information systems (HIS), and integrating with in-centre dialysis machines, laboratory results, and the Ontario Renal Reporting System (ORRS). We utilized a pilot approach in training staff, i.e., parallel paper and computer documentation.

Results: The first "go-live" launch of the new computerized documentation system occurred at Orillia Soldiers Memorial Hospital in January 2018, and at a second site in March 2018. Future launches are anticipated in June and October 2018 at the remaining in-facility sites.

Conclusion/implications: Our program has successfully developed a standardized, more visible, consistent, and accessible patient information system and data across sites. Challenges to the initiative have been incorporated into future applications of the computerized documentation system; these include MCKC clinic flow, scheduling medications, time allotted for retrospective patient data entry, and resources required to support the frontline staff.

19. Support in the Home for Peritoneal Dialysis: Implementation and Evaluation of Integrated Services

Barbara Wilson, NP, CNeph(C), London, ON

There is overwhelming evidence that "support" is a common factor that enables people to do peritoneal dialysis (PD) successfully in the home. Supportive interventions in the home, despite being almost universally recommended, can be inconsistent, poorly defined, articulated, and researched. London Health Sciences Centre (LHSC) has been designated as an early adopter of the Ontario Renal Network (ORN) Integrated Dialysis Care (IDC) initiative. The goal of the program is to reduce care gaps in the delivery of health services and improve equity in home care services provided for PD. The model will enlist the use of personal support workers (PSWs) who will be hired by one community agency and trained by the LHSC PD staff to support patients on PD in their home.

This presentation will review the processes involved in the design and implementation of the program and the preliminary evaluation. A multi-method evaluation of the program is planned. First, patients and their caregivers will be interviewed and asked about their experiences receiving support for their PD. The PD staff will participate in one focus group exploring their experiences in providing dialysis care using the IDC model. In-home PSWs will complete a survey both before and after their orientation in regards to their knowledge and training in supporting people at home on PD. These findings are of particular interest to PD programs looking to find creative ways to support their patients, improve the patient experience, decrease gaps in care, and attract and retain people on a home therapy.

Ultrasound evaluation of intraluminal needle position during hemodialysis: Incidental findings of cannulation complications

By Rosa M. Marticorena, Latha Kumar, Jovina Concepcion Bachynski, Niki Dacouris, Ian Smith, and Sandra Donnelly

INTRODUCTION

Vascular access trauma due to poor needle placement can have serious consequences in the longevity of the vascular access. Complications such as infiltration or hematoma formation may be severe, causing delay or loss of dialysis treatment and/or may prolong catheter use. Cannulation complications may require treatment interventions, thus increasing the burden of illness in patients on hemodialysis (HD) and adding to the cost burden on the healthcare system (Lee, Barker, & Allon, 2006; Marticorena, Dacouris, & Donnelly, 2018).

Although ultrasound use has become the standard of care in many HD units around the world, its use in guided cannulation is limited to cannulation of new or complicated accesses. Cannulation of an arteriovenous (AV) access for hemodialysis (HD) is routinely performed using physical assessment techniques (i.e., observation, auscultation, and palpation) (Brouwer, 2011) without ultrasound assistance (i.e., blind cannulation) (Schoch, Du Toit, Marticorena, & Sinclair, 2015). After cannulation, the position of the needle inside the vessel lumen is manually tested with a 10 mL syringe with normal saline. If there is no resistance during aspiration or infusion of saline, the needles are secured with tape, and dialysis is initiated ((Brouwer, 2011; Marticorena et al., 2018). The prescribed blood flow (300–450 mL/min) is expected to be attained within a few minutes of starting the HD treatment. If there are no machine access alarms, the assumption is that the needle is in the optimal position inside the vessel lumen.

When an access alarm is triggered, the blood pump stops and dialysis is interrupted. After confirmation that there is no infiltration, the needle is then "repositioned" (i.e., manipulated by changing its direction and angle of penetration, or rotating the bevel) until dialysis can be resumed. Needle repositioning is a common dialysis procedure that needs to be performed with excellent technique to prevent mechanical trauma by accidental laceration of the endothelia or piercing through the vessel wall (i.e., backwalling) (Brouwer, 2011; Dinwiddie, Ball, Brouwer, Doss-McQuitty, & Holland, 2013). During HD, blood flow disturbances that occur at needle sites (generated by the jet stream from the venous needle) increase as the pump speed (Qb) increases (Marticorena & Donnelly, 2016). In vitro studies have shown that the hemodynamic trauma caused by the force of the jet stream against the access wall causes endothelial cell denudation, decrease in nitric oxide (Huynh et al., 2007; Unnikrishnan et al., 2005), and activation of biochemical cascades that induce development of neointimal hyperplasia (NIH) and stenotic lesions, which, ultimately, may result in flow obstruction, thrombosis, and access loss (Roy-Chaudhury, 2005; Roy-Chaudhury, Arend, et al., 2007; Roy-Chaudhury, Spergel, Besarab, Asif, & Ravani, 2007). Needles pointing to the anterior wall in the arteriovenous fistula (AVF) during HD can result in high intensity jet stream and turbulence directed to the near vessel wall (Tuka, Wijnen, van der Sande, & Tordoir, 2009). Therefore, an optimal position in the centre of the vessel lumen is critical to minimizing mechanical trauma (caused by accidental laceration of the endothelia or piercing through the vessel

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wall) and hemodynamic trauma attributable to blood turbulence during dialysis (by directing the jet flow stream to the centre of the vessel lumen). When dialysis takes place without access alarms, the needle is assumed to be in the optimal position inside the vessel lumen. The objective of this study was to explore the accuracy of the assumption of optimal needle placement in the centre of the access lumen during HD with blind, uncomplicated cannulations.

METHOD

Design

We conducted an observational study to obtain ultrasound imaging of intraluminal needle position in patients receiving hemodialysis. The study received approval from the institutional research ethics board. This study was part of a larger study that compared metal needle versus plastic cannula in the development of complications at cannulation sites in hemodialysis vascular access (Marticorena et al., 2018) and was conducted by a single advanced operator (Marticorena et al., 2015) during ultrasound training of nursing staff.

Participants

A total 115 patients were evaluated from May 2013 to April 2014. The subjects' participation diagram is presented in Figure 1. A list of all prevalent patients receiving chronic HD treatment with an AV access was generated; these patients were evaluated only once and in sequence while attending treatment at their routine dialysis stations. They were classified in three groups: (1) patients who underwent uncomplicated cannulations (n=86); (2) patients who required needle repositioning (n=23); and (3) patients who required re-cannulation (more than two needle insertions) (n=6).

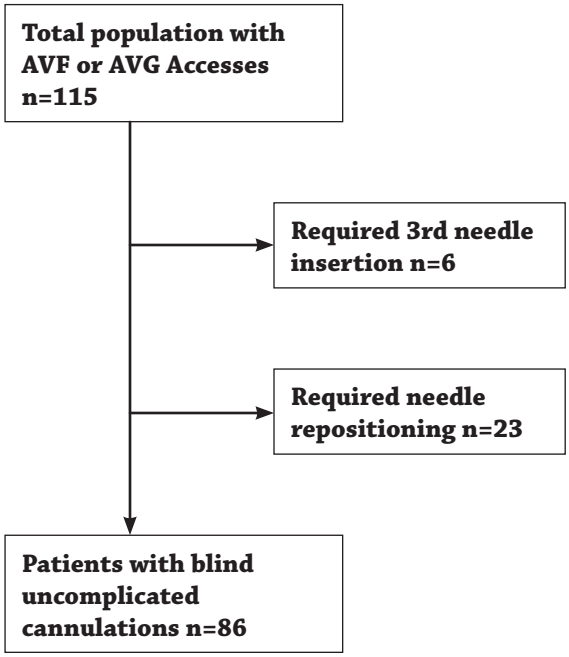

Figure 1. Subject Participation Flow Diagram

Intervention

Ultrasound evaluations of intraluminal needle position were performed in patients who underwent successful cannulations (i.e., one arterial needle and one venous needle) without ultrasound guidance (blind cannulation) and who had achieved the prescribed pump speed without interruption. All cannulations were performed by a total of 68 nursing staff with hemodialysis experience ranging from one to 22 years. Evaluations were conducted within 30 minutes of starting HD treatment. Patients with problematic cannulations received ultrasound assistance for needle repositioning or re-cannulation, and were not included in the intraluminal needle position analysis.

The needle devices used for cannulation during the study were: 1-inch or 1.25-inch 15-gauge metal needles (Nipro Corporation) and 1-inch or 1.25-inch 17-gauge plastic cannulae (Medikit, Supercath). Ultrasound evaluations were performed with the ultrasound systems SonixTouch (Ultrasonix Medical Corporation, Richmond, BC, Canada) or SonoSite S-Cath (Sonosite Canada, Markham, Ontario).

The proximity of the arterial and venous needles, and the presence of the securing tape between the two needles allowed for evaluations at the venous needle sites alone. Images were taken in short and long axes, and measurements of depth and diameter were obtained. Needle positions were classified as "anterior" (body of the needle resting against the anterior wall) (Figure 2), "posterior" (needle tip touching the back wall) (Figure 3), and "centre" (needle tip free in the centre of the vessel lumen) (Figure 4).

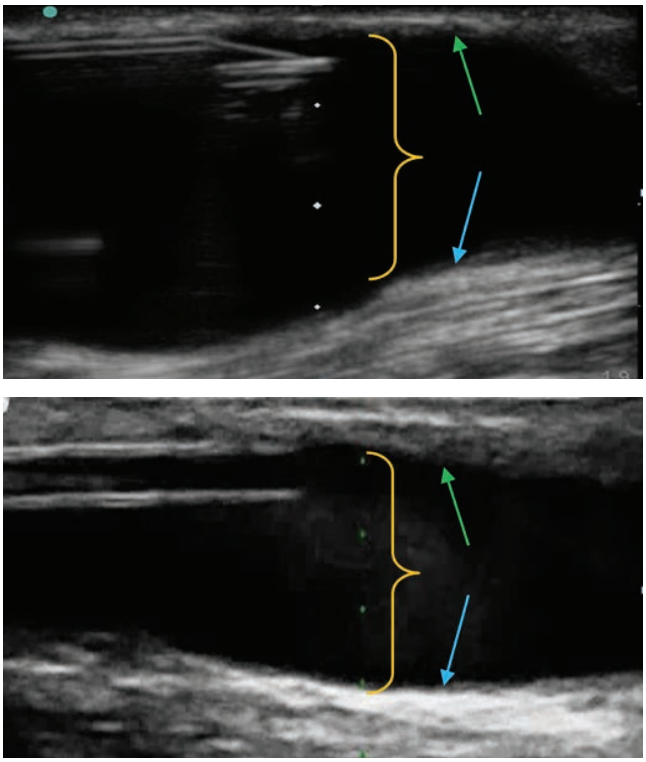

Figure 2. Anterior position (anterior wall) with metal needle with bevel up (top) and plastic cannula (bottom): anterior wall (green arrows), posterior walls (blue arrows), and intraluminal space (orange brackets)

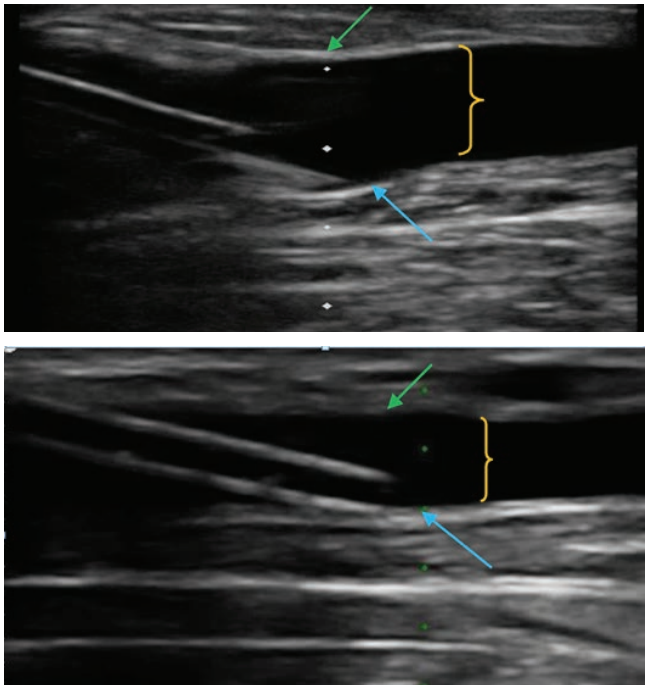

Figure 3. Posterior position (back wall) with metal needle (top) and plastic cannula (bottom): anterior wall (green arrows), posterior wall (blue arrows), and intraluminal space (orange brackets)

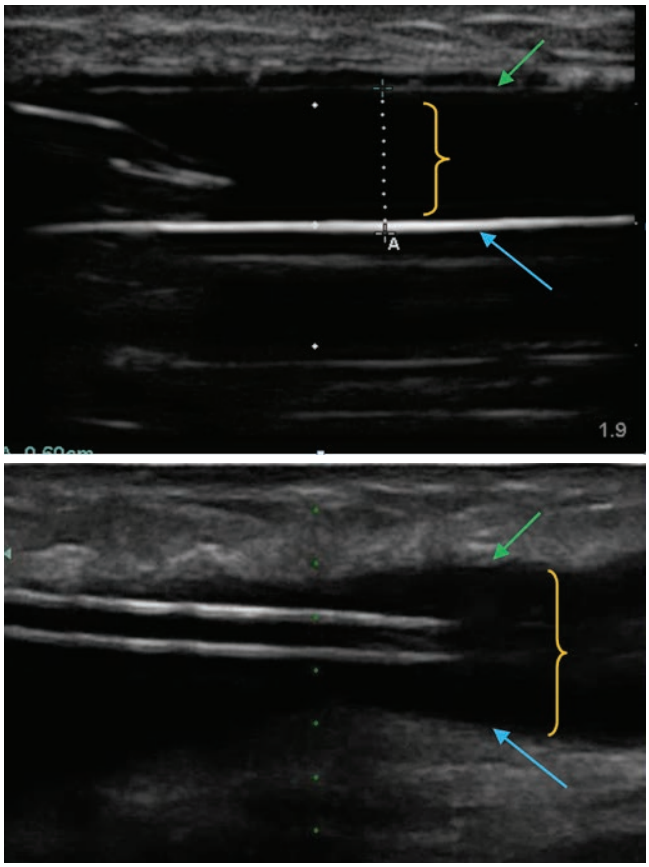

Figure 4. Centre position with metal needle with bevel up (top) and plastic cannula (bottom): anterior wall (green arrows), posterior wall (blue arrows), and intraluminal space (orange brackets)

STATISTICAL ANALYSIS

Descriptive statistics were used to present baseline demographic and clinical characteristics including age, gender, dialysis vintage, and access vintage in the study group. Normally distributed data are presented with means and standard deviations. Analysis of variance was used to compare differences between the three groups. Categorical data are presented as frequencies (percentages) and compared using chi-squared differences for proportions. Data that did not have a normal distribution were compared using the Wilcoxon signed-rank test. Statistical software IBM SPSS statistics for Windows (Version 22.0. Armonk, NY. IBM Corp.) was used for all statistical analyses in this study.

RESULTS

Baseline characteristics of the patient population are shown in Table 1. There were 86 patients in total, 50 (58.1%) males and 36 (41.9%) females. Sixty-eight patients (79.1%) had upper arm accesses and 18 (20.9%) patients had lower arm accesses. A total of 53 needles (61.6%) were in anterior wall position, 25 (29.1%) in posterior wall position, and 8 (9.3%) in the centre of the access lumen.

Table 1. *Patient Baseline Characteristics*

	N=86	%
Baseline Characteristics:		
Male	50	58.1%
Female	36	41.9%
Mean Age (yrs)	65.3 (13.9)	
Mean HD Vintage (mo)	24.6 (18.8)	
Mean Access Vintage (mo)	34.5 (132.2)	
Upper Arm Access	68	79.1%
Lower Arm Access	18	20.9%
Arterio-venous Fistula	82	95.3%
Arterio-venous Graft	4	4.5%
Cause of Renal Disease:		
DM	48	55.8%
Glomerulonephritis	10	11.6%
HTN/Vascular	17	19.8%
Other	11	12.8%
Needle Position:		
Anterior	53	61.6%
Posterior	25	29.1%
Centre	8	9.3%

(± Standard Deviation [*SD*] in brackets)

Table 2. *Distribution of Depth and Diameter by Needle Location*

Depth	Anterior	Centre	Posterior	Total
0.6 cm or less	26 (43.3%)	5 (9.1%)	24 (43.6%)	55 (64%)
0.7 cm or more	27 (87.1%)	3 (9.7%)	1 (3.2%)	31 (36%)
Diameter	**Anterior**	**Centre**	**Posterior**	**Total**
0.5 cm or less	3 (42.9%)	0 (0%)	4 (57.1%)	7 (8.1%)
0.6 cm or more	50 (61.6%)	8 (10.1%)	21 (26.6%)	79 (91.9%)

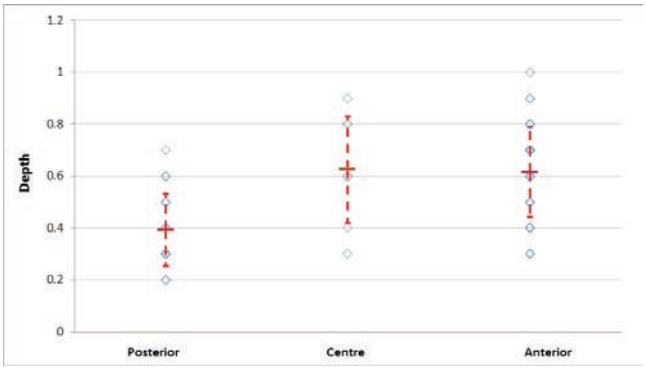

Figure 5. Needle Position by Access Depth

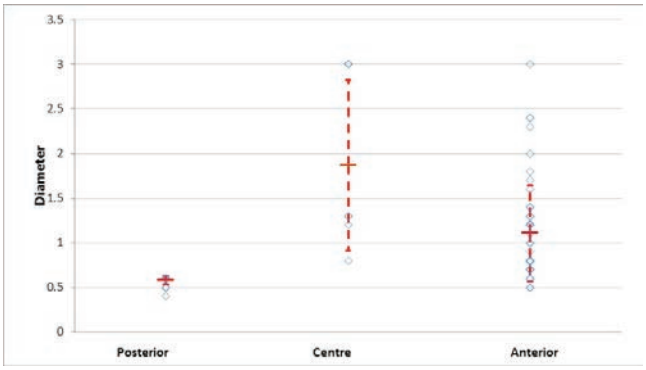

Figure 6. Needle Position by Access Diameter

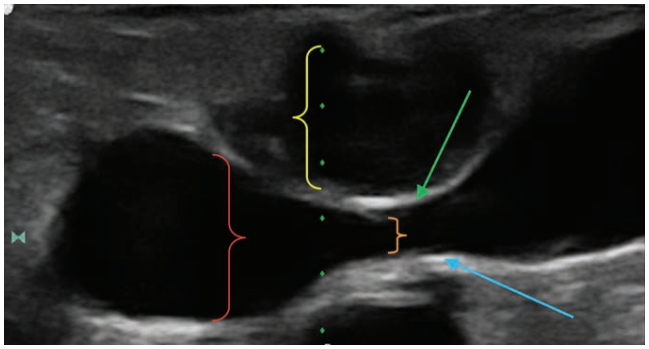

Figure 7. Anterior localized hematoma showing vessel wall distortion (yellow bracket shows the hematoma compressing the anterior vessel wall) and marked narrowing of intraluminal vessel diameter (orange bracket) compared to baseline intraluminal vessel diameter (red bracket)

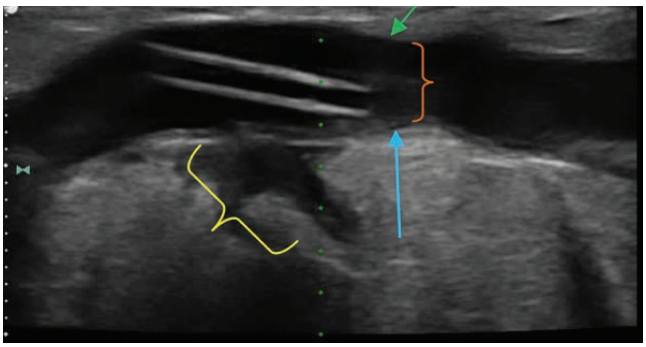

Figure 8. Posterior wall blood extravasation (yellow bracket): anterior wall (green arrow), posterior wall (blue arrow), and intraluminal space (orange bracket)

The distribution of depth and diameter by needle location is shown in Table 2. Accesses were further stratified by depth and diameter, using the depth and diameter K/DOQI criteria for cannulation (depth ≤ 0.6 cm and diameter ≥ 0.6 cm). Seventy-nine (91.9%) access diameters were ≥ 0.6 cm, and 55 (64%) access diameters were located at ≤ 0.6cm of depth from the skin surface.

Association Between Access Depth and Intraluminal Needle Position

There was an association between deep accesses (0.7 cm or more from the skin surface) and anterior needle position, this association was statistically significant (p<.001) (Figure 5).

Association Between Access Diameter and Intraluminal Needle Position

There was no association between accesses with small diameters (0.5 cm or less) or accesses of diameters of 0.6cm or more, and needle position (p=1.0) (Figure 6).

Incidental Findings of Cannulation Complications

Blood infiltrations of various sizes and configurations were identified at the cannulation sites (Figures 7 and 8). Needles piercing the back walls of an arterio-venous fistula (AVF) (Figures 9a and 9b) and an arteriovenous graft (AVG) (Figures 10a and 10b) were found in two patients. Pseudoaneurysms at the cannulation segments were identified in two subjects: One was located in the anterior wall of an AVG

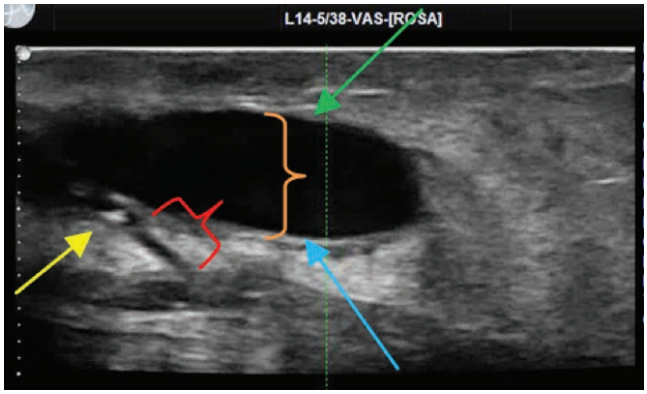

Figure 9a. Metal needle tip (yellow arrow) piercing a posterior fistula wall. Red bracket shows needle tract left after needle retraction. Green arrow points at the anterior AVF wall, blue arrow points at the posterior AVF wall, and orange bracket captures the diameter of the intraluminal space

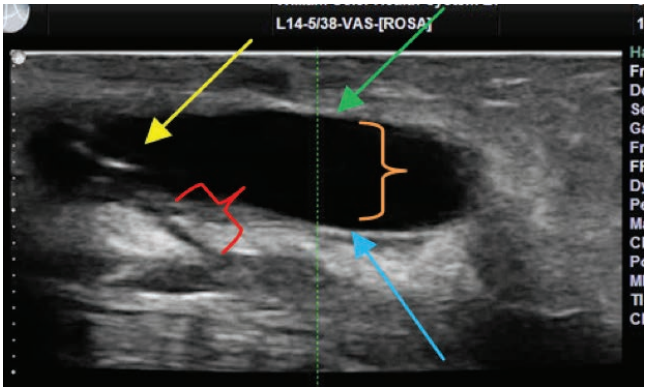

Figure 9b. Needle retracted into the intraluminal space (yellow arrow points at the needle tip)

(Figure 11a), and one was located at the lateral wall in an AVF (Figure 11b). Distinct image patterns of the jet flow stream in the intraluminal space were observed in metal needles (Figure 12a) and plastic cannula (Figure 12b).

DISCUSSION

This study showed that our assumption of needle placement in the centre of the vessel lumen with blind cannulation was correct only 9.3% of the time. These results have important implications related to mechanical and hemodynamic trauma to the inner lining of the access wall. Evaluations were performed in cannulations reported as uncomplicated, in one single stroke, and without any needle manipulation by nurses with a wide range of years of experience. Patients were receiving their treatments at their prescribed Qb, with pressures within expected ranges. In practice, alarm-free dialysis initiation indicates an optimal needle position with the jet stream from the venous needle directed to the centre of the vessel lumen flowing free of obstacles (i.e., a venous valve) or barriers (i.e., needle against the vessel wall).

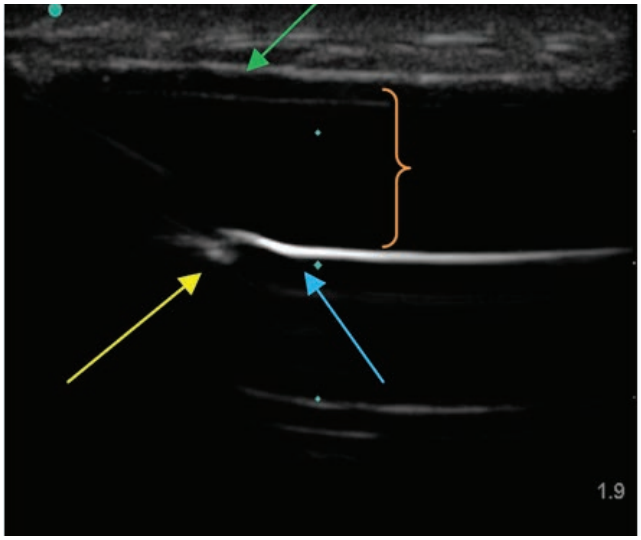

Figure 10a. Metal needle tip piercing a posterior graft wall: needle tip (yellow arrow), anterior wall (green arrow), posterior wall (blue arrow), and intraluminal space (orange bracket)

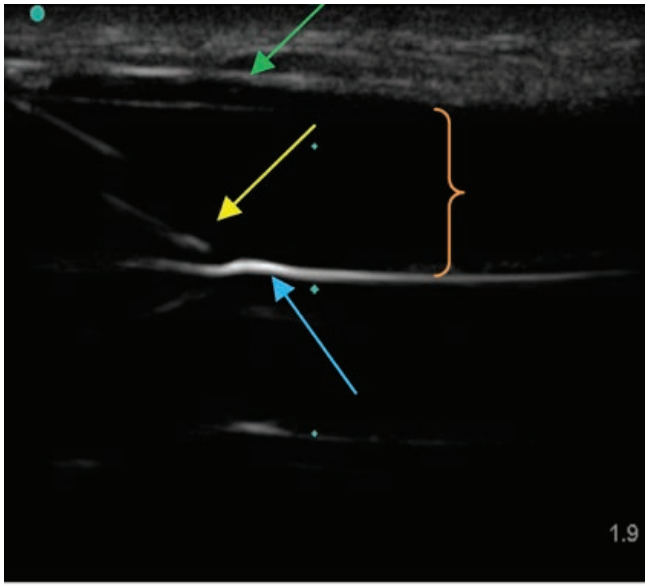

Figure 10b. Needle retracted into the arterio-venous graft intraluminal space (yellow arrow points at the needle tip)

In this study, we found that 61.6% (n=53) of the needles were in the anterior position regardless of the access depth, diameter, or depth and diameter combined together. In most cases, this was a result of the securing tape pressing the metal needle butterfly wings or the hub of the plastic cannula against the patient's access. With the needle against the anterior wall, the jet stream flows parallel to the anterior wall. The force of the jet flow stream against the endothelia for the duration of dialysis may be responsible for most of the NIH and stenotic lesions that develop at cannulation sites, which may develop at a fast pace if needle rotation in the cannulation segment is limited. In vitro models (Huynh et al., 2007; Unnikrishnan et al., 2005) and fluid dynamic computational simulation models of

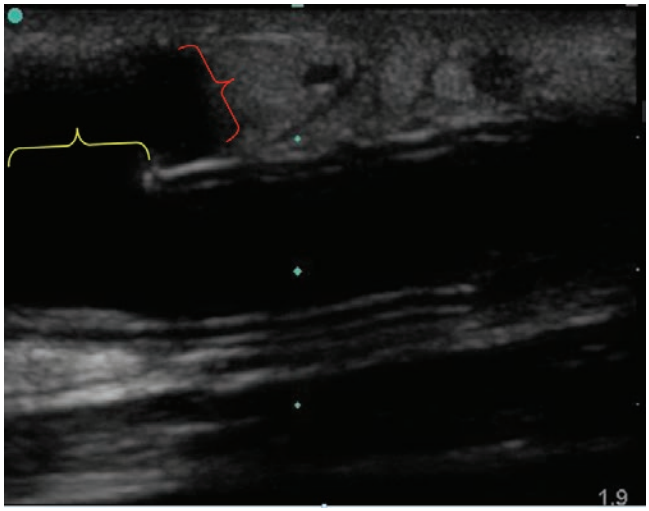

Figure 11a. Anterior graft wall destruction (yellow bracket) with pseudo-aneurysm formation (red bracket). Graft anterior and posterior walls (green brackets) and white arrows point at the two hyperechoic parallel bands characteristic of a prosthetic arterio-venous graft. Yellow dashed parallel lines show the area where the anterior graft is absent

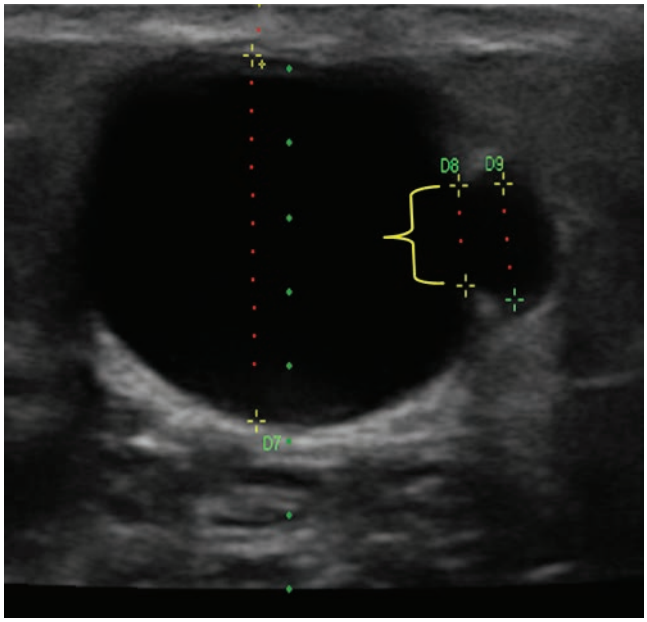

Figure 11b. Fistula showing depth of 2.07 mm from the skin surface (6D) and diameter of 12.27 mm (7D). The neck of the pseudo-aneurysm (yellow bracket) measures 3.38 mm (8D). It has a lateral wall pseudo-aneurysm with a diameter of 3.92mm (9D). Calipers are shown in yellow and connecting points are shown as red dash lines

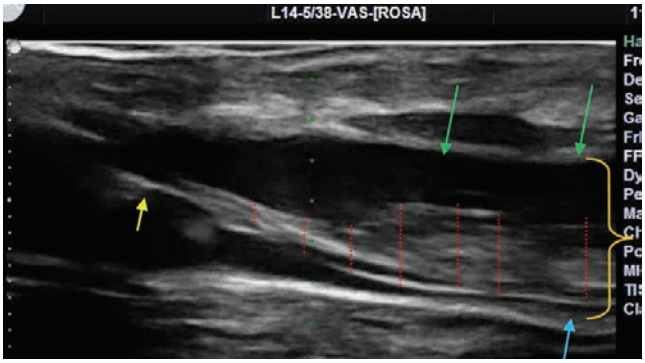

Figure 12a. Metal needle in centre position: Jet flow stream of normal saline is directed from the needle tip to the posterior vessel wall spreading downstream (red dashed lines). Yellow arrow points at the bottom tip of the metal needle; green and blue arrows point at the anterior and posterior vessel walls, respectively. The orange bracket encloses the intraluminal space

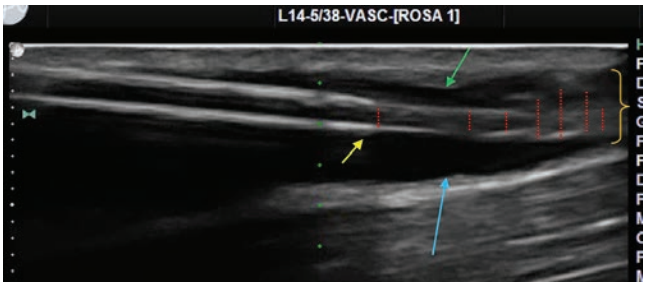

Figure 12b. Plastic cannula in centre position: Jet flow stream of normal saline is directed from the tip of the cannula to the centre of vessel lumen spreading downstream (red dashed lines). Yellow arrow points at the bottom tip of the cannula; green and blue arrows point at the anterior and posterior vessel walls, respectively; and orange bracket encloses the intraluminal space.

the hemodynamic effect of intraluminal needle position consistently indicate that shallow angles of the jet stream injection coming from the venous needle (<30 degrees) and slower pump speeds (Qb 250 mL/min) during HD minimize wall shear stress and produce the lowest blood flow disturbances and inherent endothelial damaging effect when compared to steeper angles (>30 degrees) and higher pump speeds (Qb >300 mL/min) (Barber, Fulker, Lwin, & Simmons, 2015; Fulker, Kang, Simmons, & Barber, 2013; Fulker, Simmons, & Barber, 2016; Fulker, Simmons, Kabir, Kark, & Barber, 2016; Yang, Yin, & Liu, 2017). These studies are consistent with clinical findings of increased turbulence in patients receiving hemodialysis in which mean Doppler velocities were shown to increase with increasing Qb at venous needle sites during HD (Marticorena & Donnelly, 2016; Tuka et al., 2009). Although a slower Qb might be an option for slow and long dialysis treatments (i.e., nocturnal hemodialysis), it is not an option in standard four-hour HD treatments in which Qb prescriptions of 350-400 mL/min are usually required to achieve adequate dialysis treatments.

A centre needle position is thought to be ideal when one considers the potential for mechanical trauma that may be caused by the sharp edge of a metal needle during cannulation, or during needle repositioning. Only 9.3% of needles in our study population were located in the centre position. Flow image patterns in devices in the centre position showed distinct patterns when using a plastic cannula (Figure 12a) or metal needle (Figure 12b). The metal needle jet stream was directed to the posterior wall, compared to being directed to the centre of the vessel lumen when using plastic cannulae. These observations require randomized clinical trials to determine the long-term effect of blood turbulence at needle sites, comparing metal needles and plastic cannula for HD. Twenty-nine percent (n=25) of the needle tip devices were in the posterior position. In this position, in addition to the effect of the flow injection stream on the back wall, the effect of mechanical trauma of the needle tip against the access wall was evaluated. Three levels of needle engagement were observed and classified as mild (i.e., needle tip resting on the back wall without vessel wall distortion), moderate (i.e., needle pushing the back wall with vessel wall distortion [tenting observed in AVF only]), and severe (i.e., needle tip piercing through the access wall). The unexpected findings of two cases of severe needle engagement, in which patients had no discomfort and the dialysis machine venous pressures were within parameters, caused much surprise and a new concern. One can wonder how many times "backwalling" occurs during blind cannulation or needle repositioning, and goes unnoticed. This concern may be supported by the finding of a needle tract extending from the needle tip where "backwalling" had already occurred and had left the needle mark extending from the back wall (Figure 9a); blood extravasation through this path may go unnoticed if not severe enough to cause vessel wall distortion as the one observed in Figure 7. This type of diffuse blood collection resolves slowly, surfacing to the skin over a few days. This may explain some instances in which a patient returns for their next dialysis treatment with a bruised access without any apparent reason for it. This emphasizes the importance of applying steady pressure with a tourniquet to prevent anterior wall collapse during needle insertion, as well as taking extreme caution when needle repositioning is done without ultrasound assistance (Brouwer, 2011; NKF-K/DOQI, 2006).

Superficial accesses (0.6cm or less from the skin surface) with diameters of 0.6 cm in posterior position may be at higher risk of endothelial damage when needle repositioning is required to maximize Qb. In this type of an access, cannulation with plastic cannula might need to be considered as an option to minimize the risk of accidental laceration of the endothelia or needle infiltration.

Anterior wall hematomae, located above the anterior access wall, were palpable only if they were localized (Figure 6). Diffuse hematoma was not palpable. Posterior wall hematomae, with or without vessel wall distortion, were not palpable (Figure 7) even in cases of posterior vessel wall distortion. Without visualization, posterior wall distortion might go unnoticed until severe enough to be detected by a marked change in sound at auscultation accompanied by difficult cannulations and/or the inability to reach the prescribed Qb. The altered geometry of the intraluminal space caused by hematoma compression will produce altered local hemodynamics (increased velocities) in the narrow, compressed areas until the hematoma resolves. The effect of altered hemodynamics in the interdialytic period caused by cannulation complications needs to be further studied.

LIMITATIONS

This study has the following limitations: First, the evaluations were done only once within 30 minutes of the initiation of dialysis. The possibility exists that the needle tip might have changed position inside the lumen as patients tend to rotate and or bend their arms intermittently for comfort during treatment. A second limitation is that only venous needle evaluations were obtained. The effect of the hemodynamic disturbances with negative pressures at arterial needle sites is different from the positive pressure caused by the venous jet stream; this needs to be studied in the clinical setting. Venous needle flow injection patterns can be visualized at the start of HD with "direct connection." The agitated micro-bubbles of oxygen contained in the normal saline provide contrast to allow ultrasound visualization of the flow, as it enters the intraluminal space through the venous needle. The turbulence that occurs at arterial needle sites with the blood being pulled into the dialysis circuit cannot be visualized as the blood flowing is visualized only in black with B-mode ultrasound (or in brightness mode that displays a two-dimensional image in black, white, and a few shades of grey in the screen). Turbulence at the arterial needle site may have a different effect in the access wall compared to the venous needle site.

Periodic ultrasound assessments in accesses that are reported as "problem-free" might be required to detect access complications at an early stage. The practical aspects of ultrasound use for routine cannulation or intermittent assessment of uncomplicated accesses needs to be further studied. Availability of less-expensive, portable, and user-friendly devices is needed at the bedside; only then will we be able to ensure that needles are in their optimal position during hemodialysis.

Complications related to needle insertions are common, and most patients have at least one within a few weeks of the use of the access. A success rate of only 9% for all HD treatments in the first six months of use has been reported with cannulations without ultrasound assistance (van Loon, Kessels, van der Sande, & Tordoir, 2009), compared to 85% success for all cannulations guided by ultrasound in incident and prevalent vascular accesses over a mean follow-up of approximately 10 months (Marticorena et al., 2018). The practical aspects of using ultrasound for all cannulations require further scientific evaluation.

To our knowledge, this is the first study that shows that the assumption of needle placement in the centre of the vessel lumen is correct only approximately 10% of the time with standard blind cannulation. The clinical impact of the long-term effect of the three types of intraluminal needle positions described in this study in the development of complications at cannulation sites with the two types of needle devices for cannulation of dialysis accesses warrants further exploration.

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CONTACT HOUR: 2.0 HRS

Management of pain in patients on hemodialysis

By Rachel Liu and Marisa Battistella

LEARNING OBJECTIVES

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

- Describe the epidemiology and pathophysiology of pain in patients on hemodialysis.
- Identify methods for pain assessment in this population.
- Summarize an approach to pain management.
- Discuss appropriate pharmacologic and non-pharmacologic agents for pain management.

INTRODUCTION

The International Association for the Study of Pain (IASP) defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" (Merskey & Bogduk, 1994, p. 210). Pain among patients on hemodialysis remains under-recognized and its severity underestimated, and is inadequately treated (Weisbord, Fried, et al., 2007; Davison, & Ferro, 2009; Abdel-Kader, Unruh, & Weisbord, 2009; Claxton, Blackhall, Weisbord, & Holley, 2010; Koncicki, Unruh, & Schell, 2017). The aims of this article are to review the recent studies discussing pain assessment and management in patients on hemodialysis, and to investigate strategies that can be utilized in daily practice to address pain.

EPIDEMIOLOGY AND PATHOPHYSIOLOGY

Pain is one of the most commonly experienced symptoms in hemodialysis, with greater than 58% of patients affected and approximately half of these patients rating the intensity of pain as moderate to severe (Weisbord et al., 2003; Davison, 2003; Barakzoy & Moss, 2006; Davison, Koncicki, & Brennan, 2014). A systematic review reported rates of effective pain control in patients on hemodialysis varying from 17% to 38%, and up to 84% of patients reporting significant pain without receiving analgesia (Wyne, Rai, Cuerden, Clark, & Suri 2011). A recent study of patients on hemodialysis in the United States found that almost two-thirds of patients received at least one opioid prescription each year, and more than one-fifth received annual chronic opioid prescriptions (defined as greater than three months) (Kimmel et al., 2017; Han et al., 2017). Understanding the reasons for high prescription opioid use and misuse among hemodialysis patients can help identify strategies for supporting safe opioid prescribing and pain management.

Pain experienced by hemodialysis patients is often multifactorial, including nociceptive, somatic, visceral, neuropathic, and complex regional pain syndromes (Davison, 2003). The etiology of pain may be attributed to many reasons including: co-morbidities (e.g., diabetes, vascular disease), the primary renal disease (e.g., polycystic kidney disease), as a consequence of renal failure (e.g., calciphylaxis, renal osteodystrophy), or due to the dialysis treatment itself (e.g., recurrent needle insertion, arteriovenous access pain and cannulation) (Davison, 2003; Salisbury et al., 2009). Differentiating between the different types of pain and their potential causes is important for determining optimal management strategies.

BARRIERS TO PAIN MANAGEMENT

In order to develop optimal management pain strategies, it is important to consider the potential barriers in providing optimal interventions. In hemodialysis patients, there still remains paucity in literature that elucidates reasons for undertreatment, as there are currently few studies published explaining potential causes (Weisbord, 2016). One observational study has suggested that language has been a barrier to optimal pain management, with 42% of dialysis patients unable to speak English (Salisbury et al., 2009). A prospective cohort study with 45 hemodialysis patients attributed the widespread prevalence of untreated pain due to patients being unforthcoming about their pain, unless directly asked (Barakzoy & Moss, 2006). Other potential barriers include the healthcare provider's ability to

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recognize and treat pain (Koncicki, Unruh, & Schell, 2017). Almost 70% of nephrology providers report self-confidence in treating pain, yet only 37% assess for and treat pain regularly. This discrepancy may be due to insufficient training and experience with managing pain in this population (Salisbury et al., 2009, Green et al., 2012).

In dialysis patients, pain management is further complicated by taking the dialyzability of analgesics into consideration, which can alter the pharmacokinetic (the handling of drug by the body) and pharmacodynamic (the resulting effect of the drug on the body) properties of these medications. Factors to consider for the dialyzability of analgesics include: technical aspects of the dialysis procedure, lipophilicity, water solubility, volume of distribution, protein binding, and the extent of renal and non-renal clearance, for both parent drug and active metabolites (Li, McLin, & Castillo, 2015; de Castro, Murphy, & Battistella, 2013). For example, morphine-6-glucoronide, the active metabolite of morphine, is cleared renally and accumulates with decreased renal function. This increases the risk for adverse effects such as respiratory depression, which is why morphine should be avoided in patients on hemodialysis (Koncicki, Brennan, Vinen, & Davison, 2015; Koncicki, Unruh, & Schell, 2017). Effective prescribing must be balanced with the risks and benefits, taking careful safety consideration of patients at highest risk for adverse outcomes such as sedation, respiratory depression or falls, as these are commonly associated adverse effects of analgesics and can lead to death (Koncicki, Unruh, & Schell, 2017; Krashin, Murinova, Jumelle, & Ballantyne, 2015). Advanced age, multiple co-morbidities, and polypharmacy can increase the risk of analgesic toxicities (Nayak-Rao, 2011).

BURDEN OF PAIN

Moderate or severe pain negatively affects quality of life, being associated with increased rates of depression, insomnia, irritability, inability to cope with stress, increased perception of burden of disease, decreased perception of social support, and decreased life satisfaction (Davison & Jhangri, 2005; Cohen, Patel, Khetpal, Peterson, & Kimmel, 2007; Davison & Jhangri, 2010; Aitken et al., 2013; Koncicki, Unruh, & Schell, 2017). For patients undergoing hemodialysis, uncontrolled pain leads to shortened or missed treatments, increased hospitalizations, and increased emergency department visits (Weisbord et al., 2014). In maintenance dialysis patients, an association was found between opioid prescriptions and increased risk of death, dialysis discontinuation, and hospitalization (Kimmel et al., 2017; Han et al., 2017). Inadequate pain management leads to poorer outcome, in addition to higher cost to the healthcare system, which emphasizes the need for timely identification, assessment, and provision of appropriate analgesic management in these patients.

PAIN ASSESSMENT

Pain assessment involves an organized history to elucidate the cause of pain, its location, quality, severity, and the impact on physical, social, and emotional functioning (Barnard & Gwyther, 2006; Li, McLin, & Castillo, 2015). Symptom assessment tools currently validated for hemodialysis patients include: the modified Edmonton Symptom Assessment System (mESAS), Palliative Care Outcome Scale-Renal (POS-renal), Dialysis Symptom Index (DSI), and the Brief Pain Inventory (BPI) (Davison, 2003; Weisbord et al., 2004; Davison, Jhangri, & Johnson, 2006b; Murphy, Murtagh, Carey, & Sheerin, 2009; Davison, Koncicki, & Brennan, 2014; Upadhyay, Cameron, Murphy, & Battistella, 2014). A limitation with the mESAS tool is that it is not specific to pain and includes a visual 0–10 analog scale of 10 prevalent symptoms present in hemodialysis (Davison, Jhangri, & Johnson, 2006a; Davison, Koncicki, & Brennan, 2014). Other assessment tools include the McGill Pain Questionnaire; this, however, has not been validated in hemodialysis patients. Additional assessment tools have been validated in the renal population, including Kidney Dialysis Quality of Life-Short Form/36-item Short Form Health Survey (SF-36) and the CHOICE Health Experience Questionnaire, which are more extensive (Wu et al., 2001; Joshi, Mooppil, & Lim, 2010; Davison, Koncicki, & Brennan, 2014). The aim for regularly administered assessment tools would be improvement in pain identification and treatment for hemodialysis patients (Upadhyay et al., 2014).

PAIN MANAGEMENT

There have been recently published approaches to general pain management in hemodialysis patients (Table 1) (Davison & Jhangri, 2005; Davison, Koncicki, & Brennan, 2014; Dowell, Haegerich, & Chou, 2016; Koncicki, Unruh, & Schell, 2017; Raina, Krishnappa, & Gupta, 2017). The approach in Table 1 outlines key steps to effectively assess and manage pain in patients on hemodialysis in which the initial goal is to elicit a good history using the PQRST mnemonic for pain assessment. Providing patient education regarding pain management should follow. Assessing risks and benefits when deciding appropriate pharmacological and/or non-pharmacological agents for pain should be the next step. This is followed by the appropriate monitoring and follow-up in order to optimize pain management (Dowell, Haegerich, & Chou, 2016; Koncicki, Unruh, & Schell, 2017; Raina, Krishnappa, & Gupta, 2017).

Management of pain differs depending on the type of pain. Pain is categorized into nociceptive and neuropathic, with differing treatment approaches associated with each type. Nociceptive pain occurs through stimulation of receptors as a result of tissue damage. This is further categorized into two types: somatic (caused by inflammation of tissue and localized to a specific area) and visceral (initiated by pathology of internal organs and more difficult to localize). Neuropathic pain is caused by a lesion or disease of the somatosensory system (Jensen et al., 2011). Both nociceptive and neuropathic pain can equally affect the hemodialysis patient, and are not mutually exclusive (Koncicki, Unruh, & Schell, 2017).

NON-PHARMACOLOGIC AND PHARMACOLOGIC OPTIONS

Non-pharmacologic options include exercise, massage, acupuncture, and cognitive behavioural therapy, and these are preferred before initiating pharmacologic therapy (Koncicki, Unruh, & Schell, 2017; Pham et al., 2017).

There are many considerations with initiating pharmacologic therapy. Due to altered drug pharmacokinetics and physiological aspects in hemodialysis patients, individual dosing is advised (Koncicki, Unruh, & Schell, 2017; Pham et al., 2017). Important altered drug pharmacokinetics and physiological considerations include increased drug levels and associated adverse effects due to reduced drug renal clearance (Pham et al., 2017; Kamarzarian et al. 2016). Other considerations include accumulation of the parent compound and/or its metabolite, or increased free drug levels due to reduced protein binding associated with hypoproteinemia/hypoalbuminemia and/or acidemia (Pham et al., 2017; Kamarzarian et al, 2016). Because there are limited dosing recommendations published in literature for hemodialysis patients, close monitoring for efficacy and adverse effects is recommended (Koncicki, Unruh, & Schell, 2017; Pham et al., 2017). The removal of drug by dialysis must also be considered (Pham et al., 2017). Although there are no consensus guidelines for pain management, the World Health Organization (WHO) three-step analgesic ladder has been recommended in patients on hemodialysis (Davison, 2003; Davison & Jhangri, 2005; Koncicki, Unruh, & Schell, 2017). Validation studies have demonstrated that the implementation of the renal adaptation of the WHO analgesic ladder can reduce pain scores in hemodialysis patients (Barakzoy & Moss, 2006; Salisbury et al., 2009).

Table 1. *General Pain Management Approach Tool for Hemodialysis Patients*

Steps	Considerations
Pain assessment	• "P": Precipitating or palliating factors: What makes the pain better? What makes the pain feel worse? • "Q": Quality: Can you describe what the pain feels like? Is it stabbing, throbbing, or burning? • "R": Region or radiation: Can you point with 1 finger where the pain is? Does it stay in 1 spot or does it move? • "S": Severity: How would you rate the pain from 1 to 10, with 10 being the worst? • "T": Timing: When did the pain first start? Is it constant or does it come and go throughout the day?
Use the World Health Organization (WHO) three-step analgesic ladder for nociceptive pain	• Caution with decreased clearance as there is an increased risk of adverse effects • Start low, titrate slow • Give medications orally if possible and on a scheduled basis • Extra or "breakthrough" doses should be available for pain uncontrolled by scheduled medications and/or for incidental pain
Set realistic goals of therapy	• Pain free should not be the end goal, but a reduction in pain in order to improve functional status and quality of life
Follow-up	• Schedule close evaluation of adequate pain relief and assessment of total daily dosage of medication used based on patient use
Monitor for adverse effects	• If adverse effects are intolerable, consider switching to a medication on the same "step"

(Davison & Jhangri, 2005; Davison, Koncicki, & Brennan, 2014; Konicicki Unruh, & Schell, 2017)

NOCICEPTIVE PAIN

A general overview for nociceptive pain management is provided by the WHO's three-step analgesic ladder (Table 2). Mild pain (step 1) should be treated by analgesics such as acetaminophen or NSAIDs (Barakzoy & Moss, 2006; Koncicki, Unruh, & Schell, 2017; Pham et al., 2017). Step 2 is for mild pain not responsive to acetaminophen or NSAIDs, or pain that is rated as moderate severity. Step 2 agents include tramadol and low-dose opiates such as oxycodone or hydromorphone. Agents in step 3 are for severe pain, including higher doses of opiates such as oxycodone or hydromorphone, or long-acting fentanyl for pain that is not adequately controlled by step 2 agents, or pain rated as severe (Barakzoy & Moss, 2006; Koncicki, Unruh, & Schell, 2017). Hydromorphone is the preferred short-acting opioid in patients on hemodialysis, as it is better tolerated than morphine with less neuro-excitatory effects (Davison, Koncicki, & Brennan, 2014; Koncicki, Unruh, & Schell, 2017). Oxycodone and tramadol can be used as short-acting agents. However, use of these agents requires caution because of their increased half-lives associated with decreased renal clearance (Davison, Koncicki, & Brennan, 2014; Kurella, Bennett, & Chertow, 2003; Lugo & Kern, 2004; Koncicki, Unruh, & Schell, 2017). For chronic pain, patients may benefit from long-acting medications such as long-acting transdermal fentanyl or oral methadone (Barakzoy & Moss, 2006; Koncicki, Unruh, & Schell, 2017). Methadone requires a referral to an experienced specialist. However, it remains to be a reasonable alternative that is well-tolerated (Koncicki et al., 2015). Oral buprenorphine requires further study to better understand its pharmacokinetic and pharmacodynamic properties in hemodialysis patients before safe and effective use can be recommended. The few studies conducted in hemodialysis patients have been in small sample sizes, and the transdermal formulation of buprenorphine was used (Filitz et al., 2006; Mordarski, 2009; Davison & Ferro, 2009; Koncicki, Unruh, & Schell, 2017). Medications to avoid due to altered pharmacokinetics and side effects secondary to decreased kidney function include: morphine, codeine, hydrocodone, and meperedine (Barakzoy & Moss, 2006; Murtagh et al., 2007; Salisbury et al., 2009; Li, McLin, & Castillo, 2015; Koncicki et al., 2015).

Basic guidelines in prescribing opioids must be followed to avoid abuse and misuse. Important considerations include: preferential use of non-opioid over opioid therapy

Table 2. *WHO Analgesic Ladder Adapted for Hemodialysis Nociceptive Pain*

WHO Ladder	Analgesic	Recommendation/Considerations	Monitoring
Step 1: Mild Pain	Acetaminophen	Recommended by the National Kidney Foundation as the preferred analgesic for hemodialysis.	Hepatotoxicity with underlying liver disease or long-term alcohol use exceeding 4,000 mg/day
	NSAIDs	Can be used in hemodialysis patients for short-term periods under close supervision for adverse effects. NSAIDs and COX-2 inhibitors likely adversely affect renal hemodynamics equally.	Worsening hypertension, volume retention, hyperkalemia, gastrointestinal bleed, or loss of residual kidney function
Step 2: Moderate Pain	Oxycodone (short-acting)	Use cautiously due to increased half-life with decreased renal clearance.	Nausea, CNS depression, constipation
	Tramadol (short-acting)	Use cautiously due to increased half-life as active metabolites are predominantly cleared renally, and clearance with dialysis is minimal. Reduction in dose and dosing frequency is recommended.	Nausea, CNS depression, constipation May cause seizures in conditions associated with lower seizure threshold Risk for serotonin syndrome with concomitant serotonergic medications
Step 3: Severe Pain	Hydromorphone (short-acting)	Preferred short-acting opioid in patients with advanced kidney disease. Approximately 50% of medication is removed with dialysis; however, no data regarding active metabolite accumulation exist. Reduction in dose and increasing dosing interval is recommended.	Nausea, CNS depression, constipation Metabolite accumulation may cause neuro-excitation with agitation, confusion, and hallucinations.
	Fentanyl (long-acting)	For chronic pain, long-acting medications can be used if patients are not opioid-naive and have been previously treated with opioids. Should not be used first-line in opioid-naive patients because of higher probability of non-fatal overdose compared with immediate-release or short-acting medications in the first 2 weeks of treatment. Transition to long-acting should occur when the patient is well-controlled on a stable regimen; however, caution is advised as titration can be difficult. If patient is transitioning to long-acting medication, acute exacerbations of pain may occur ("breakthrough pain"). Having a short-acting medication available is suggested.	Nausea, CNS depression, constipation
	Methadone	Appears to be well tolerated. There is increased elimination through the gastrointestinal tract in individuals with decreased kidney function so reduced dose is recommended.	Nausea, CNS depression, constipation High potential for drug interactions
Medications to avoid in decreased kidney function:	• Morphine – accumulation of active metabolite (morphine-6-glucuronide); case reports of patients with decreased kidney function experiencing respiratory and CNS depression, myoclonus, and death • Codeine – reduced clearance and prolonged half-life; adverse effects reported include: nausea, vomiting, hypotension, CNS depression, respiratory arrest • Hydrocodone – limited information in these patients; reduced clearance of parent compound and metabolites • Meperidine – active metabolite (normeperidine) has prolonged half-life; adverse effects reported include: myoclonus, altered mental status, seizures • Buprenorphine – newer agent that requires further study in these patients		

(Barakzoy & Moss, 2006; Filitz, Griessinger, Sittl, Likar, Schüttler, & Koppert, 2006; Murtagh, et al., 2007; Mordarski, 2009; Salisbury, et al., 2009; Li, McLin, & Castillo, 2015; Koncicki, Brennan, Vinen, & Davison, 2015; Miller, Barber, & Leatherman, 2015; Dowell, Haegerich, & Chou, 2016; Koncicki, Unruh, & Schell, 2017; Pham et al., 2017; Raina, Krishnappa, & Gupta, 2017)

in chronic pain treatment; evaluating risks and benefits prior to initiation; determination and patient discussion of patient goals; use of lowest effective dose; avoidance of concurrent opioids and benzodiazepines whenever possible; and regular patient follow-up for the assessment of risks and benefits of continuing opioid use (Pham, et al., 2017). For patients with opioid use disorder, clinicians should offer or arrange evidence-based therapies, including medication-assisted treatment, and psychosocial support through behavioural change strategies (e.g. psychotherapeutic counselling and family therapy) (Pham, et al., 2017; Dowell, Haegerich, & Chou, 2016).

Table 3. *Topical analgesics in the management of acute and chronic pain in hemodialysis*

Analgesic	Considerations	Monitoring
Diclofenac 1.16 % gel	Topical NSAIDs are more widely studied than other agents. Evidence suggests topical NSAIDs can be recommended for short-term pain relief in patients with acute soft tissue injuries or chronic joint-related conditions such as osteoarthritis	Pruritus, burning, erythema, local allergy, and blistering
Lidocaine 5% cream (e.g., MaxileneTM)	Evidence suggests better pain control of post-herpetic neuralgia compared with oral pregabalin	Pruritus, erythema, and edema
Capsaicin 0.025-0.025% cream	Limited evidence	Local pain, stinging, burning, erythema

(Argoff, 2013; Davison, Koncicki, & Brennan, 2014; Pham et al., 2017; Finnerup et al., 2015)

Table 4. *Analgesics for neuropathic pain in hemodialysis*

Analgesic	Considerations	Monitoring
Gabapentin Pregabalin	• May be partially cleared with dialysis, thus recommended to dose after dialysis • May require titration to effect • Caution use in elderly to avoid potential adverse effects	*Gabapentin:* somnolence, drowsiness, dizziness, ataxia, fatigue, nystagmus, and tremor *Pregabalin:* dizziness, somnolence, peripheral edema, and dry mouth
Tricyclic antidepressants (e.g. amitriptyline, desipramine, nortriptyline)	• More effective than serotonin and norepinephrine reuptake inhibitors for neuropathic pain • Less anticholinergic side effects with desipramine, nortriptyline	Orthostatic hypotension, sedation, anticholinergic effects (e.g., blurred vision, delirium, constipation, dry mouth, urinary retention, sedation)
Selective serotonin and norepinephrine reuptake inhibitors (e.g., venlafaxine, duloxetine)	• Limited evidence in hemodialysis patients • Doses should start low with slow titration and close monitoring for adverse effects.	Drowsiness, insomnia, dizziness, nausea, weakness

(Koncicki, Brennan, Vinen, & Davison, 2015; Koncicki, Unruh, & Schell, 2017; Davison, Brennan, & Koncicki, 2014; Innis, 2006; Naylor & Raymond, 2011; Kurella, Bennett, & Chertow, 2003)

Whenever applicable and safe, topical administration of analgesics may be preferred over oral or non-topical parenteral routes to reduce systemic drug concentrations, and minimize drug interactions and systemic toxicities (Table 3) (Pham et al., 2017; Argoff, 2013). Topical analgesics including diclofenac have been shown in small studies to be effective in relieving both soft tissue injuries and various inflammatory musculoskeletal conditions. Although topical NSAIDs have been reported to have more favourable tolerability profiles, including gastrointestinal and cardiovascular events, compared with oral agents, data on renal toxicities are lacking (Pham et al., 2017; Argoff, 2013). There is literature that supports the use of topical lidocaine and capsaicin for neuropathic pain (Pham et al., 2017; Finnerup et al., 2015). However, despite lower blood levels with use of topical analgesics, caution is advised with prolonged or high-dose use due to the risk of adverse effects from skin absorption and systemic accumulation, and the lack of evidence comparing renal and fluid/electrolyte adverse effects between topical and systemic NSAIDs (Pham et al., 2017).

NEUROPATHIC PAIN

Neuropathic pain is common in hemodialysis, and can range from systemic causes such as diabetes, and causes related to dialysis such as secondary amyloid (Mambelli et al., 2012; Koncicki, Unruh, & Schell, 2017). Due to limited quality and quantity of evidence in the hemodialysis population, treatment should follow the guidelines published by the International Association for the Study of Pain (IASP) for management of neuropathic pain in the general population. Special considerations in addition to following these guidelines include altered clearance of medications and increased risk of adverse effects in the hemodialysis population (Innis, 2006; Dworkin et al., 2007; Naylor & Raymond, 2011). Common neuropathic symptoms include pain, numbness, or tingling in the elbow, distal arm, and medial hand of the fifth digit. Such symptoms can potentially lead to functional impairment if left untreated (Nardin, Chapman, & Raynor, 2005; Koncicki et al., 2015). First-line agents include calcium channel alpha-2-delta ligands (e.g., gabapentin and pregabalin), tricyclic antidepressants, and serotonin and norepinephrine reuptake inhibitors (Table 4) (Dworkin et al., 2007; Naylor & Raymond, 2011). Titration of these agents may be necessary to achieve relief and may also require opioids or tramadol as bridging therapy (Davison, Koncicki, & Brennan, 2014; Koncicki, Unruh, & Schell, 2017). Gabapentin and pregabalin have been specifically evaluated in patients on hemodialysis, and are the preferred agents of choice (Naylor & Raymond, 2011; Koncicki, Unruh, & Schell, 2017). They have been proven

to show improvements in pain, depression, and subjective sleep and quality-of-life scores. However, these benefits must be balanced with the risks of many side effects such as drowsiness, dizziness, somnolence, and tremor (Biyik, et al., 2013; Atalay, et al., 2013; Koncicki, Unruh, & Schell, 2017).

In addition to pharmacologic therapy, innovative methods to improve pain management in hemodialysis patients include implementing initiatives from various members of the multidisciplinary healthcare team (Weisbord et al., 2013; Koncicki, Unruh, & Schell, 2017). For example, the Symptom Management Involving End-Stage Renal Disease (SMILE) Study evaluated the impact of a trained nurse intervention on symptom management in hemodialysis patients (Weisbord et al., 2013). Although no statistically significant outcomes were found for nursing interventions in improving pain compared to the control arm, the study highlighted that a multidisciplinary nephrology team can help identify and treat symptoms, and this is a potential area for further research (Weisbord et al., 2013; Koncicki, Unruh, & Schell, 2017).

CONCLUSION

Chronic pain is a common and disabling symptom for patients on hemodialysis. With effective pain management, patients can have increased comfort, safety, and satisfaction of care that can improve their overall quality of life (Williams & Manias, 2008). Routine pain assessments, use of practice guidelines that are evidence-based, and engaging other inter-professional healthcare team members are all strategies that can be implemented to improve patient care quality. Opportunities for further research include implementing multidisciplinary strategies for pain assessment and management, conducting updated pharmacokinetic studies, and composing and validating practice guidelines to help guide clinicians with optimal pain management for hemodialysis patients.

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CONTINUING EDUCATION STUDY QUESTIONS **CONTACT HOUR: 2.0 HRS**

Management of pain in patients on hemodialysis

By Rachel Liu and Marisa Battistella

1. Rates of hemodialysis patients experiencing pain has been reported to be as high as:
   a) 25%
   b) 50%
   c) 58%
   d) 84%

2. A recent American study reported almost two-thirds of study patients received opioid prescriptions at least:
   a) once annually
   b) twice annually
   c) monthly
   d) quarterly each year

3. Common causes of pain in hemodialysis patients include the following except:
   a) polycystic kidney disease
   b) recurrent needle insertion
   c) renal osteodystrophy
   d) hypertension

4. Barriers to adequate pain management in hemodialysis patients include all of the following except:
   a) altered pharmacokinetics of drug and type of dialysis
   b) language
   c) prescriber expertise with pain assessment
   d) patients' being generally unforthcoming with pain

5. Pain is associated with all of the following except:
   a) decreased quality of life
   b) increased hospitalization
   c) inability to cope with stress
   d) decreased cost to healthcare system

6. Which of the following assessment tools has not been validated in studies with hemodialysis patients?
   a) Modified Edmonton Symptom Assessment Score
   b) McGill Pain Questionnaire
   c) Palliative Care Outcome Scale-Renal
   d) Dialysis Symptom Index

7. Which of the following questions is not generally included during pain assessment:
   a) quality
   b) radiation
   c) stinging
   d) timing

8. NS is a 50-year-old male on hemodialysis. He is currently taking the maximum dose of acetaminophen, but is still experiencing moderate-severe pain, described as a burning sensation. After deciding to discontinue acetaminophen due to its ineffectiveness, which of the following is the most appropriate analgesic to initiate?
   a) codeine
   b) hydromorphone
   c) pregabalin
   d) fentanyl

9. AT is a 28-year-old female on hemodialysis. She was recently started on oxycodone for her pain. What adverse effect(s) would you monitor for?
   a) constipation, nausea, respiratory depression
   b) sedation, seizures, dizziness
   c) all of the above
   d) none, this medication is generally well tolerated

10. PR is a 70-year-old female on hemodialysis. She is currently experiencing some muscle pain on her right shoulder. She finds acetaminophen to be ineffective, and the team is hesitant to prescribe ibuprofen. Which of the following would be a reasonable option to recommend?
    a) diclofenac 1.16% gel
    b) lidocaine 5% cream
    c) menthol cream
    d) capsaicin 0.050% cream

CONTINUING EDUCATION STUDY ANSWER FORM

CE: 2.0 HRS CONTINUING EDUCATION

Management of pain in patients on hemodialysis

Volume 28, Number 2

By Rachel Liu and Marisa Battistella

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7.	a	b	c	d
8.	a	b	c	d
9.	a	b	c	d
10.	a	b	c	d

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Do you belong to RNAO?
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Professional Status
❑ Registered Nurse
❑ Registered Practical Nurse/Registered Nursing Assistant/ Licensed Practical Nurse
❑ Technician
❑ Technologist
❑ Other (Specify) _____

Number of years in nephrology _____

Area of responsibility
❑ Direct Patient Care
❑ Administration
❑ Technical
❑ Teaching
❑ Research
❑ Other (Specify)

_____

Work environment
❑ Acute Care
❑ Self-Care Unit
❑ Independent Health Care
❑ Private Sector

Highest level of education

Nursing	*Non-Nursing*
❑ Diploma	❑ Diploma
❑ Baccalaureate	❑ Baccalaureate
❑ Master's	❑ Master's
❑ Doctorate	❑ Doctorate

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❑ Baccalaureate	❑ Baccalaureate
❑ Master's	❑ Master's
❑ Doctorate	❑ Doctorate

Primary area of practice
Choose one
❑ Adults
❑ Combined Adult/Pediatrics
❑ Pediatrics
❑ Other

Select all that apply
❑ Full-Care Hemo
❑ Self-Care Hemo
❑ Home/Independent Hemo
❑ In-Patient Nephrology
❑ In-Patient Peritoneal Dialysis
❑ In-Patient Transplantation
❑ Home/Independent PD
❑ Out-Patient Transplantation
❑ Clinical Educator
❑ Academic Educator
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Guidelines for authors

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

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

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

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

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

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

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

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

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

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

How should the manuscript be submitted?
Email your manuscript to: **cannt.journal1@gmail.com**. Include a covering letter with contact information for the primary author and a one-sentence biographical sketch (credentials, current job title and location) for each author.

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Each manuscript will be acknowledged following receipt. Research and clinical articles are sent out to two members of the *CANNT Journal* manuscript review panel to be reviewed in a double-blind review process. All manuscripts may be returned for revision and resubmission. Those manuscripts accepted for publication are subject to copy editing; however, the author will have an opportunity to approve editorial changes to the manuscript. The editor reserves the right to accept or reject manuscripts. The criteria for acceptance for all articles include originality of ideas, timeliness of the topic, quality of the material, and appeal to the readership. Manuscripts that do not comply with APA formatting and style will be returned to the author(s).

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- Text of article, with abstract if applicable, **double-spaced, pages numbered**
- References (on a separate sheet)
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Revised March 2018

Lignes directrices à l'intention des auteurs

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

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

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

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

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

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

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

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

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

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À la réception de chaque manuscrit, un accusé de réception est envoyé. Les articles de recherche et d'études cliniques sont envoyés à deux membres du comité de révision du Journal de l'ACITN afin d'être révisés suivant un processus à double insu. Tous les articles peuvent être retournés aux auteurs pour révision et nouvelle soumission par la suite. Les manuscrits acceptés pour publication peuvent subir des changements éditoriaux; toutefois, les auteurs pourront approuver ces changements. La rédactrice en chef se réserve le droit d'accepter ou de refuser tout manuscrit. Les critères d'acceptation pour tous les manuscrits comprennent l'originalité des idées, l'actualité du sujet, la qualité du matériel et l'attrait des lecteurs. Les manuscrits qui ne sont pas conformes à la mise en forme et au style de l'AAP seront renvoyés à l'auteur ou aux auteurs.

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