CANNT JOURNAL
JOURNAL ACITN

CANNT ACITN
CANADIAN ASSOCIATION OF NEPHROLOGY NURSES AND TECHNOLOGISTS
L'ASSOCIATION CANADIENNE DES INFIRMIÈRES ET TECHNICIENS DE NÉPHROLOGIE

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Letter from the Editor

Welcome to the first issue of the *CANNT Journal* in 2017. This year represents another year of change for the editorial team at the *CANNT Journal* and at the helm of the CANNT Board of Directors.

Matt Phillips, my co-editor and partner in crime for the past two seasons, has decided to hang up his editorial hat. I would like to thank Matt for his professionalism, dedication and commitment to excellence, and above all, his support, and friendship during our time as co-editors. I would also like to thank Anne Moulton, CANNT Past President, for her commitment and dedication to, and support of the journal.

I would like to welcome Heather Dean as the new CANNT President. Heather brings a perspective to the table that is uniquely her own. The editorial team at *CANNT Journal* in collaboration with Pappin Communications looks forward to our continued collaboration with the CANNT Board of Directors, under Heather's leadership.

In this issue, we present a very timely article detailing the role of a psychiatry-focused nurse practitioner in hemodialysis and the opportunity this presents for integrated care. This issue also focuses on acute kidney injury secondary to lymphoma as the feature article under our Continuing Education Series. Both articles provide a plethora of applicable information.

The delivery of quality articles in a renowned journal such as the *CANNT Journal* requires exceptional teamwork and collaboration. I would like to thank our team of peer reviewers who continue to generously donate their time and expertise to ensure that every manuscript that arrives on our doorstep for review metamorphoses into a polished product that resonates with the nephrology community at large. I would like to thank the authors for sharing their knowledge and for their high-calibre work—you are the lifeline of the journal.

Allow me this opportunity to strongly encourage seasoned and budding authors to submit manuscripts—know that the information presented in the articles has the potential to reaffirm or change practice in the pursuit of excellence in nephrology.

As noted in the *CANNT Journal* and website, there is preference for manuscripts that present new clinical information or address issues of special interest to the CANNT audience, such as:

- 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 series.

CANNT Journal also welcomes letters to the editor. If you have an issue that you need to highlight, consider using the *CANNT Journal* as a platform to share your message. The team at *CANNT Journal* constantly strives to make each issue to be meaningful to your respective practice.

Jovina Bachynski
CANNT Journal
Editor-In-Chief

Mot de rédactrice en chef

Bienvenue au premier numéro du *Journal de l'ACITN* de 2017. Cette année représente une autre année de changement pour l'équipe de rédaction du *Journal de l'ACITN* et pour le conseil d'administration de l'ACITN.

Matt Phillips, mon corédacteur et complice depuis les deux dernières saisons, a décidé d'accrocher son chapeau de rédacteur. Je tiens à remercier Matt pour son professionnalisme, son dévouement et son engagement envers l'excellence, mais par-dessus tout, pour son soutien et son amitié durant le temps que nous avons passé ensemble à la rédaction. Je remercie également Anne Moulton, présidente sortante de l'ACITN, pour son engagement, son dévouement et son soutien envers notre revue professionnelle.

Je tiens à souhaiter la bienvenue à Heather Dean, nouvelle présidente de l'ACITN. Heather apporte à la table une perspective bien à elle. L'équipe de rédaction du *Journal de l'ACITN*, en collaboration avec la société Pappin Communications, se réjouit à l'idée de poursuivre sa collaboration avec le conseil d'administration de l'ACITN, sous la direction d'Heather.

Dans ce numéro, nous présentons un article très à propos qui définit le rôle d'infirmière praticienne spécialisée en hémodialyse axé sur la psychiatrie et l'occasion que cela représente pour les soins intégrés. Ce numéro se concentre également sur l'atteinte rénale aiguë attribuable au lymphome, sujet abordé dans l'article de fond de notre série d'articles de formation continue. Ces deux articles fournissent une abondance de renseignements pertinents.

La publication d'articles de qualité dans une revue réputée comme le *Journal de l'ACITN* exige un travail d'équipe et une collaboration exceptionnels. Je souhaite remercier nos lecteurs critiques, qui continuent de donner généreusement leur temps et de mettre à profit leur expertise pour métamorphoser chaque manuscrit qui nous est présenté aux fins d'évaluation en article irréprochable qui trouve écho auprès de la communauté de néphrologie dans son ensemble. À tous les auteurs, merci de partager vos connaissances; votre travail exceptionnel est essentiel au bon fonctionnement de cette revue.

Permettez-moi de profiter de cette occasion pour encourager fortement les professionnels chevronnés comme les personnes nouvellement admises dans la profession à nous soumettre leurs manuscrits; sachez que l'information présentée dans ces articles a le potentiel de réaffirmer ou de modifier la pratique et s'inscrit dans notre quête d'excellence en néphrologie.

Comme nous l'avons indiqué dans le *Journal de l'ACITN* et sur le site Web de l'association, la préférence va aux manuscrits qui présentent une nouvelle information clinique ou abordent des enjeux particulièrement intéressants pour le public de l'ACITN, par exemple :

- Mémoires de recherche originaux
- Articles cliniques pertinents
- Rapports d'amélioration de la qualité novateurs
- Textes descriptifs sur l'expérience en soins infirmiers
- Questions et réponses sur la pratique interdisciplinaire
- Évaluations d'articles, de livres et de vidéos actuels
- Série d'articles de formation continue.

Le *Journal de l'ACITN* accepte aussi les lettres d'opinion. Si vous souhaitez faire la lumière sur une question en particulier, vous pouvez utiliser le *Journal de l'ACITN* comme plateforme pour partager votre message. L'équipe du *Journal de l'ACITN* cherche à faire en sorte que chaque numéro puisse s'appliquer à vos pratiques respectives.

Jovina Bachynski
Rédactrice en chef du Journal de l'ACITN

Le Journal ACITN est la publication officielle de l'Association canadienne des infirmiers/infirmières et technologues en néphrologie, a/s P.O. Box 10, 59 Millmanor Place, Delaware, ON N0L 1E0, téléphone : (519) 652-6767, télécopieur : (519) 652-5015, Courriel : cannt@cannt.ca. Publié quatre fois par année, ce journal est envoyé à tous les membres de l'Association. L'abonnement annuel est: Canada, 80 $ (+TVH), E.-U., 90 $, hors du Canada et E.-U., 115 $. Les publications antérieures, lorsque 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, P.O. Box 10, 59 Millmanor Place, Delaware, ON N0L 1E0.

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

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A new adventure begins...

My name is Heather Dean and I am your new CANNT President. I feel very honoured to say that. I am very proud to be a certified nephrology nurse and a member of the Canadian Association of Nephrology Nurses and Technologists (CANNT).

I would like to start by thanking Anne Moulton for agreeing to extend her term as CANNT President and cover my leave of absence to travel. Anne has been a true ambassador for all CANNT members. She has led with a focus to maintain CANNT as a vibrant and informative organization that renal healthcare professionals are proud to be members of. Anne represented CANNT at EDTNA/ERCA 2016 in Valencia, Spain. She also presented and raised CANNT as an organization on a world stage. I feel very privileged to have served on the CANNT board with her. Anne is not only a colleague—she is a friend.

The news these days is focusing on what sets us apart: gender, ethnicity, sexual preference, the list goes on.

Over the past three months, I was blessed to have travelled to many different places. Travelling opened my eyes to so many things I had never seen or experienced before. I realize now that many of my perceptions as to what is "normal" have been formulated by what I have seen on TV, read in the news, or simply heard and held as truths.

The more I walked beside people, as they went about their daily lives, and listened to their stories, the similarities stood out more than the differences. People everywhere want to live peaceful lives, love their families, and provide a better future for their children. I asked many questions about healthcare throughout my travels. I spoke with a nephrology nurse in Alice Springs, Australia, and a physician working with *Doctors without Borders*. I visited the Flying Doctors (Royal Flying Doctor Service of Australia), and the School of Air (correspondence schools catering to children in remote and outback Australia). I spoke with the husband of a community nurse who works in the most remote areas of Australia. I visited a satellite hemodialysis unit in Perth, Australia. I spoke to a father about his experience in a maternity hospital in Vietnam that has 300 births/day and a young man who lost his father to cancer and the care he had available to him. People generally explained their medical coverage or lack of medical coverage. We are very lucky to live in Canada. Yes, I do mean lucky. I was born in Canada. Most of the people I spoke with also considered themselves "lucky". Their healthcare standard has improved compared with their parents, and they are providing a "better" life for their children. They voiced pride in their country and standard of living.

On reflection, my experience talking to people during my travel has taught me the following: Meet people where they are at; listen before I speak; ask what people need before I offer what I think they need; inquire about their culture; and listen to learn. Diversity should not be feared—it should be embraced.

We, as nephrology professionals, strive to improve the lives of people and their families living with kidney disease. We experience diversity everyday. I look forward to celebrating and sharing all the different ways our members work each day towards our goal.

We all make a difference. We all have a story. We all make a choice every day—I choose to be positive!

Please feel free to contact me. I would love to hear YOUR story.

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

Une nouvelle aventure commence...

Je m'appelle Heather Dean et je suis votre nouvelle présidente de l'ACITN. C'est un honneur pour moi. Je suis très fière d'être infirmière certifiée en néphrologie et membre de l'Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN).

Je souhaite tout d'abord remercier Anne Moulton, qui a accepté de prolonger son mandat à titre de présidente de l'ACITN afin de couvrir mon congé autorisé alors que je voyageais. Anne a été une réelle ambassadrice pour tous les membres de l'ACITN. Elle a présidé l'ACITN avec le souci constant de faire en sorte que l'organisation demeure dynamique et informative et que les professionnels de la santé en néphrologie soient fiers d'en faire partie. Anne a représenté l'ACITN au congrès 2016 de l'Association européenne d'infirmières et infirmiers de dialyse et de transplantation/Association européenne pour les soins des reins à Valence, en Espagne. Elle a également présenté et encensé l'ACITN sur la scène mondiale. Je me sens très privilégiée d'avoir siégé au conseil de l'ACITN avec elle. Anne n'est pas seulement une collègue, elle est aussi une amie.

De nos jours, les nouvelles sont axées sur ce qui nous divise : le genre, l'origine ethnique, l'orientation sexuelle et ainsi de suite.

Au cours des trois derniers mois, j'ai eu le privilège de voyager dans de nombreux endroits différents. Le voyage m'a ouvert les yeux sur de nombreuses réalités que je n'avais jamais vues ou expérimentées auparavant. Je réalise maintenant que bon nombre de mes perceptions sur ce qui est « normal » ont été formatées par ce que j'ai vu à la télévision, lu aux nouvelles ou simplement entendu et cru d'emblée.

À force d'accompagner les gens dans leur vie quotidienne et d'écouter leurs histoires, j'ai réalisé que les similitudes ressortaient davantage que les différences. Partout, les gens veulent vivre une vie paisible, aimer leur famille et offrir un meilleur avenir à leurs enfants. J'ai posé beaucoup de questions sur les soins de santé au cours de mes déplacements. J'ai discuté avec une infirmière en néphrologie à Alice Springs, en Australie, et avec un médecin qui travaillait avec Médecins sans frontières. J'ai visité les « médecins volants » de l'organisme Royal Flying Doctor Service, en Australie, ainsi que l'organisme School of the Air, un service d'écoles par correspondance offert aux enfants australiens vivant dans des endroits reculés de l'arrière-pays. J'ai discuté avec le mari d'une infirmière en soins communautaires qui travaille dans les régions les plus éloignées de l'Australie. J'ai visité une unité satellite d'hémodialyse à Perth, en Australie. J'ai écouté un père de famille me parler de son expérience dans une maternité du Vietnam qui voit naître 300 bébés par jour et j'ai conversé avec un jeune homme qui a perdu son père à cause du cancer et des soins auxquels il avait eu accès. Les gens me parlaient surtout des soins médicaux dont ils disposaient ou du manque de soins médicaux. Nous sommes très chanceux d'habiter au Canada. Oui, je dis bien chanceux. Je suis née au Canada. La plupart des gens à qui j'ai parlé s'estimaient également chanceux. Les soins de santé auxquels ils ont accès se sont beaucoup améliorés par rapport à l'époque de leurs parents, et ils peuvent offrir une « meilleure » vie à leurs enfants. Ils ont exprimé de la fierté à l'égard de leur pays et de leur niveau de vie.

Après mûre réflexion, en parlant avec les gens durant mon voyage, j'ai appris ce qui suit : il est important de rencontrer les gens là où ils se trouvent, d'écouter avant de parler, de demander aux gens ce dont ils ont besoin avant de leur offrir ce que nous croyons qu'il leur faut, de se renseigner sur la culture des gens et d'apprendre à écouter. Il ne faut pas craindre la diversité, mais plutôt l'accueillir à bras ouverts.

En tant que professionnels en néphrologie, nous nous efforçons d'améliorer la vie des gens qui vivent avec une maladie rénale et celle de leur famille. Nous rencontrons la diversité chaque jour. Je suis impatiente de célébrer et de partager toutes les différentes façons dont travaillent nos membres chaque jour pour atteindre notre objectif.

Nous faisons tous une différence. Nous avons tous notre histoire. Nous faisons tous des choix chaque jour, et je choisis d'être positive!

N'hésitez pas à communiquer avec moi. J'adorerais entendre VOTRE histoire.

Salutations cordiales,
Heather Dean, inf. CNéph(C),
Présidente de l'ACITN

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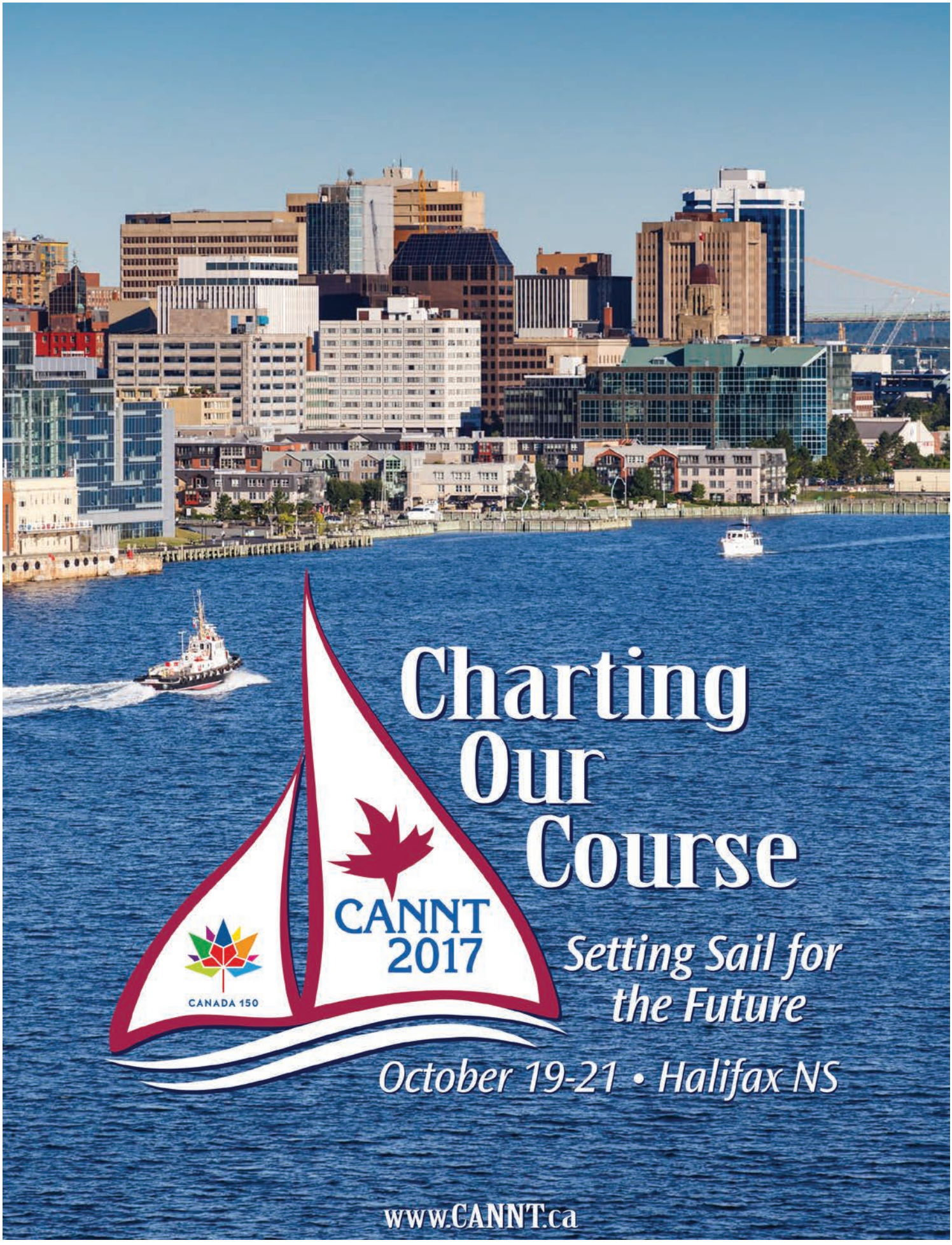
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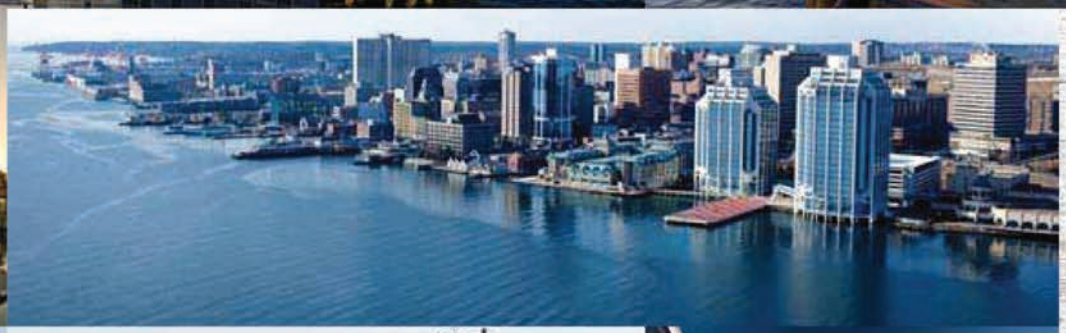


HALIFAX

Come aboard in Halifax, NS, October 19-21, 2017. Experience all the new Nova Centre has to offer. The spectacular view over-looking the Halifax Harbour will inspire, renew and challenge you to *set sail for the future.*

Share in the messages of top rated professional speakers. Workshops and breakout sessions on topics that will educate and challenge you are being planned, including: Transitioning pediatric to adult care, CKD and hypertension, medical assistance in dying, and behaviour change management.

Join us on October 20, 2017, for our traditional Ceilidh (kitchen party), where you can enjoy live music and sample the local cuisine. *Halifax is ready to welcome you!*

Your Board in Action

The Board in Action report provides our members with updates on current and proposed activities of the Board of Directors (BOD).

The Board of Directors (BOD) historically consisted of eight elected members: President-elect, president, four vice-presidents (Western, Ontario, Atlantic, and Technical), a website/treasurer and the guidance and experience from our past president. The journal co-editors and our office administration staff complete our working group.

With the introduction of the newly adopted "President-Elect/Treasurer" and "Director of Communications" positions, we hope to serve the membership more effectively. These changes were voted in by the membership at our 2015 Annual General Meeting (AGM) in Vancouver, and the changes to the BOD structure came into effect at the 2016 Annual General Meeting (AGM) in London, ON.

I am both excited and inspired to be working with such a professional and motivated BOD.

MEMBERSHIP

We currently have a membership of 458 renal professionals. Increasing our membership and providing value in your membership is the key to our organization. The BOD continually evolves to provide enduring benefits to all our members.

Whether you are interested in strengthening your renal network, furthering your knowledge, or maybe just in need of a networking opportunities, professional organizations can be a great option for you. In addition to providing information about your chosen field, professional organizations can enhance your personal and professional development and provide endless networking opportunities.

CANNT membership provides you with access to our members only section of the website. This area provides many resources at your fingertips. These resources, such as the Vascular Access Guidelines and Standards of Nursing and Technical Practice, are readily available to our members for use in enhancing their knowledge and supporting their professional practice. Our seasonal peer reviewed journal is touted as both an educational and informational resource for nephrology professionals across the nation. Becoming a part of this professional organization offers opportunities to apply for CANNT bursaries and grants, and funding for CNA certification and re-certification in nephrology. We also recognize our professionals nationally with our yearly awards nominations.

JOURNAL

I would like to take this opportunity to express my gratitude and thanks for the commitment and time that our journal co-editors have given to our association in order to provide the membership with a high-quality peer-reviewed journal on a quarterly basis. As we bid farewell to one of our co-editors, Matthew Phillips, we kindly thank him for all that he has given to our membership and the positive changes he has implemented into our journal.

Guidelines for journal article submission can be found under the "CANNT Journal" section of the CANNT website.

COMMUNICATIONS

Website: www.cannt.ca
Twitter: @CANNT1
Facebook

We are enthusiastically looking forward to the membership response to having a BOD position (Director of Communications) to maintain external communications on behalf of CANNT. This role will be paramount in pioneering, leading, and participating in the execution of the CANNT communications strategies in collaboration with the Board of Directors and CANNT National Office.

We brainstorm at our monthly meetings to identify the best way to connect and communicate on a national basis in a timely, consistent fashion. In the very short time in her role as your Director of Communications, Michelle Trask has significantly increased the visits, likes, and website traffic. Please share your ideas with us and let us know how to connect with you. Use your association to communicate your renal professional information, news, events, or important dates. In the meantime, we will keep up with our efforts to provide you with multimedia communication strategies and bi-monthly email updates.

ANNUAL CONFERENCE

CANNT 2017 is themed "Charting Our Course—Setting Sail for the Future" and your conference committee is working hard to create an innovative and exciting program to meet the needs of nephrology professionals from novice to advanced practice. We hope to see you in Halifax on October 19–21, 2017. The conference venue is the Halifax World Trade and Convention Centre in downtown Halifax.

FINANCES

As a "Not for Profit" professional association, our objective is to provide value to our members that stays within our mission and vision. In an effort to keep upright and steady, we are consistently seeking out growth and development opportunities to assist in maintaining the viability of the association. We remain fiscally responsible in governing our costs to function as your BOD.

Your BOD realizes the need for forecasting and budgeting to support our efforts at representing fiscal responsibility to the membership and have identified this as our priority over the first part of 2017.

Your association 2016 Annual Report is available on the CANNT website.

Janice Mackay
CANNT 2016–2018
President-Elect/Treasurer

Votre conseil d'administration en action

Le rapport du conseil d'administration fournit aux membres des mises à jour sur les activités réalisées et proposées par le conseil d'administration (CA).

Traditionnellement, le CA était constitué de huit membres élus : un président élu, un président, quatre vice-présidents régionaux (Ouest, Ontario, Atlantique et Technologues), un vice-président des technologues, un coordonnateur du site Web/trésorier et le président sortant, qui agit à titre de conseiller. Les corédacteurs du Journal de l'ACITN et notre personnel administratif viennent compléter notre groupe de travail.

Avec l'introduction des postes nouvellement adoptés de président élu/trésorier ou présidente élue/trésorière et de directeur ou directrice des communications, nous espérons augmenter notre efficacité auprès des membres. Ces changements dans la structure du CA ont été votés par les membres à l'occasion de notre assemblée générale annuelle (AGA) de 2015 à Vancouver et sont entrés en vigueur lors de l'AGA de 2016 à London, en Ontario.

Je suis à la fois enthousiasmée et inspirée à l'idée de travailler avec un CA aussi professionnel et motivé.

ADHÉSION

Notre association compte actuellement 458 professionnels en néphrologie. L'augmentation du nombre d'adhésions et l'offre d'une valeur ajoutée constituent pour nous la clé du succès. Le CA évolue continuellement pour offrir des avantages tangibles à tous nos membres.

Que ce soit pour renforcer votre réseau dans le domaine de la néphrologie ou approfondir vos connaissances, ou simplement pour trouver des occasions de réseautage, les organisations professionnelles peuvent représenter une excellente option. En plus de mettre à votre disposition de l'information sur votre domaine de spécialité, les organisations professionnelles peuvent contribuer à votre développement personnel et à votre perfectionnement professionnel et vous offrir d'innombrables occasions de réseautage.

L'adhésion à l'ACITN vous donne accès à la section réservée aux membres de notre site Web. Cette zone contient des ressources utiles et accessibles en un seul clic. Ces ressources, par exemple les lignes directrices relatives à l'accès vasculaire, les normes de pratique infirmière en néphrologie et les normes de pratique technologique en néphrologie, sont mises à la disposition des membres qui souhaitent approfondir leurs connaissances et perfectionner leur pratique professionnelle. Notre revue périodique évaluée par les pairs est considérée comme une ressource éducative autant qu'informative pour les professionnels en néphrologie partout au Canada. En devenant membre de cette organisation professionnelle, vous aurez la possibilité de demander des bourses et des subventions de l'ACITN et d'accéder à un soutien financier pour la certification infirmière de l'AIIC en néphrologie ou le renouvellement de certification. Nous reconnaissons également l'excellence de nos professionnels à l'échelle nationale au moyen d'un programme de reconnaissance annuel.

JOURNAL DE L'ACITN

Je tiens à profiter de l'occasion pour exprimer ma gratitude et transmettre mes remerciements aux corédacteurs du Journal de l'ACITN pour leur dévouement et pour le temps investi dans notre association afin d'offrir à nos membres une revue évaluée par les pairs de grande qualité, publiée tous les trois mois. Nous remercions chaleureusement notre corédacteur Matthew Phillips, qui doit nous quitter, pour tout ce qu'il a su offrir à nos membres et pour les changements positifs qu'il a apportés à notre revue professionnelle.

Si vous souhaitez soumettre un article à des fins de publication dans le Journal de l'ACITN, veuillez consulter la section « CANNT Journal » du site Web de l'ACITN.

COMMUNICATIONS

Site Web : www.cannt.ca
Twitter: @CANNT1
Facebook

Nous attendons avec enthousiasme les réactions des membres en ce qui a trait à l'introduction du poste de directeur ou directrice des communications au sein du CA afin de gérer les communications externes au nom de l'ACITN. Ce rôle sera primordial dans la conception, la direction et la mise en œuvre des stratégies de communication de l'ACITN, en collaboration avec le CA et le bureau national de l'ACITN.

À l'occasion de nos réunions mensuelles, nous prenons le temps de réfléchir à la meilleure façon d'atteindre les gens et de transmettre nos messages à l'échelle nationale de manière opportune et cohérente. Durant la très brève période pendant laquelle Michelle Trask a occupé le poste de directrice des communications, elle est parvenue à augmenter considérablement l'achalandage sur notre site Web ainsi que le nombre de réactions sur Facebook. Nous vous invitons à nous faire part de vos idées et à nous dire comment entrer en contact avec vous. Utilisez votre association pour transmettre de l'information, des nouvelles, des événements ou des dates importantes à votre professionnel en néphrologie. Entretemps, nous poursuivrons nos efforts pour vous fournir des stratégies

de communication multimédia et des mises à jour bimensuelles par courriel.

CONGRÈS ANNUEL

Le Congrès annuel 2017 de l'ACITN se déroulera sous le thème « Tracer notre voie – cap sur l'avenir » *(Charting Our Course – Setting Sail for the Future)*. Votre comité organisateur du congrès travaille fort pour créer une programmation novatrice et captivante qui répond aux besoins des professionnels en néphrologie, quel que soit leur niveau d'expertise. Nous espérons vous voir à Halifax du 19 au 21 octobre 2017. Le congrès se déroulera au Halifax World Trade and Convention Centre, au centre-ville d'Halifax.

FINANCES

En tant qu'association professionnelle à but non lucratif, notre objectif est d'offrir une valeur ajoutée à nos membres conforme à notre mission et à notre vision. Dans le but d'offrir des services constants, nous recherchons constamment des occasions de croissance et de développement pour assurer la viabilité de l'association. Nous demeurons responsables de la gouvernance de nos coûts sur le plan financier pour fonctionner en tant que CA.

Le CA est conscient de la nécessité de faire des prévisions et d'établir un budget de façon à assumer sa responsabilité financière envers les membres et en a fait sa priorité durant la première partie de 2017.

Le rapport annuel de 2016 de l'association est accessible sur le site Web de l'ACITN.

Janice Mackay
Présidente élue/trésorière de l'ACITN pour 2016–2018

NOTICE BOARD

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

SPRING 2017

- **May 1–15, 2017:** exam period

FALL 2017

- **June 1–September 1, 2017:** initial exam or renewal by exam application window
- **November 1–15, 2017:** exam period
- **January 3–November 30, 2017:** application window to renew by continuous learning

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- **April 7–10, 2017.** American Nephrology Nurses' Association (ANNA) National Symposium, Marriott Wardman Park, Washington, DC. **www.annanurse.org**
- **June 3–6, 2017.** 54th European Renal Association—European Dialysis and Transplant Association (ERA- EDTA) Congress, IFEMA, Feria de Madrid, Madrid, Spain. **www.era-edta2017.org**
- **September 9–12, 2017.** 46th Annual European Dialysis and Transplant Nurses Association/European Renal Care Association (EDTNA/ERCA) International Conference, Krakow Congress Center, Krakow, Poland. **www.edtna-erca.com**
- **September 20, 2017.** Nephrology Health Care Professionals' Day.
- **October 19–21, 2017.** Canadian Association Nephrology Nurses and Technologists (CANNT) 49th National Symposium 2017—Charting our Course: Setting Sail for the Future, Halifax, Nova Scotia. **www.cannt.ca**
- **October 31–November 5, 2017.** The American Society of Nephrology (ASN) 2017 Kidney Week, Morial Convention Center, New Orleans, Louisiana. **www.asn-online.org**

The psychiatry-integrated nurse practitioner role in hemodialysis: An opportunity to provide nurse practitioner care between the interface of psychiatry and hemodialysis

By Brock Cooper, Kien Dang, Ann Jones, and Alison Thomas

ABSTRACT

The mental health of patients living with end-stage kidney disease (ESKD) is an important aspect of their care. According to national survey data, depressive disorders affect about 9% of the North American population (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). A review of psychological distress and depression across the spectrum of chronic kidney disease indicates that the prevalence of depression in ESKD is reported to be about four times that of the general population and it is associated with adverse outcomes including low quality-of-life ratings, graft failure, and death after renal transplantation (Zalai, Szeifert, & Novak, 2012).

At St. Michael's Hospital (SMH), patients on hemodialysis (HD) requiring psychiatry consultation had traditionally been referred to a dedicated outpatient psychiatrist. This presented challenges around access to psychiatry assessment and follow-up, as patients were reluctant to attend appointments outside of HD visits. The team recognized these challenges and addressed them through the introduction of the Medical Psychiatry NP (MP NP) role, as the point-of-care consultant in HD.

Psychiatry-integrated NP care has been positively received by both stakeholders and patients in the hemodialysis program, and access to mental health care is improved secondary to the introduction of this model. The SMH experience offers insights into this model of care for other HD units and outpatient nephrology treatment settings.

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INTRODUCTION

Hemodialysis (HD) is a treatment modality that is required to sustain life for individuals who are affected by end-stage kidney disease (ESKD) unless a kidney transplant is obtained. This intervention may have a pervasive impact on these individuals, as well as on their support systems. Patients with ESKD are confronted with numerous stressors including: the metabolic effects of ESKD; the need to adjust to the schedule of attending HD; changes in body image secondary to placement of a vascular access; dietary restrictions; and changes in appetite, sleep, and family roles. In addition to a loss of control over their lives, patients with ESKD are faced with fear of death and the potential onset of depression or anxiety, both of which make it difficult to focus on medical advice (Schwartz & Batson, 2000). The provision of psychiatric care to patients on HD is challenging when care is offered outside of the unit and outside of the HD schedule. Patients may have difficulty committing to additional appointments above and beyond 12 hours a week of HD due to time constraints or transportation issues. We describe an innovative way of providing integrated psychiatric care within the HD unit in a quaternary care centre in Toronto, Canada.

BACKGROUND AND LITERATURE REVIEW

According to national survey data, the prevalence rate of depressive disorders is approximately 9% of the North American population (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). A review of psychological distress and depression across the spectrum of chronic kidney disease indicates that the prevalence of depression in ESKD is reported to be about four times that of the general population and it is associated with adverse outcomes including low quality-of-life ratings, graft failure, and death after renal transplantation (Zalai, Szeifert, & Novak, 2012). A prospective study that followed patients for 16 months after starting HD revealed that

nearly 20% of patients had chronic depression or anxiety (Cukor, Coplan, Brown, Peterson, & Kimmel, 2008). Based on these findings, it is realistic that many patients may struggle to make sense of the change in their health status and question "Why me?" It is this process of questioning combined with factors such as resilience, individual temperament, and personality, as well as the presence and magnitude of psychiatric illness, that may influence an individual's ability to cope and adjust to life on dialysis. Nevertheless, studies concerning provision of psychiatric services in the HD setting are not well represented in the literature.

Historically, social work clinicians have been integral to the adjustment and coping of patients on HD. Social work roles traditionally include counselling, patient and family advocacy, providing assistance with developing advance directives, and educating patients on how to access available resources such as housing, employment, income, and transportation to dialysis. Patients on HD may also require ongoing follow-up for management of a pre-existing or new onset psychiatric disorder. Common psychiatric issues encountered within this patient subpopulation include primary insomnia, mood or anxiety disorders, neurocognitive disorders, and personality dysfunction. In addition, capacity screening may be indicated or requested by the nephrology team, as underlying psychiatric disorders may adversely affect an individual's ability to provide informed consent. Ontario's *Health Care Consent Act* states that an individual is deemed capable if he or she is able to understand information that is relevant to making a decision about a treatment, personal care assistance or admission to a healthcare facility, and is able to appreciate the most tangible consequences of a decision or lack thereof (Kadri, Blackmer, & Ibrahim, 2014).

NURSE PRACTITIONERS

Nurse practitioners (NPs) are registered nurses in the extended class who have successfully completed an NP program at an accredited university and hold a master's degree in nursing. The scope of the role entails competencies in four categories:

- professional role, responsibility, and accountability;
- health assessment and diagnosis;
- therapeutic management; and
- health promotion and prevention of illness and injury.

Leadership, research, and education are other domains of practice integral to the NP role (CNA, 2010).

Nurse practitioners have been clinically active in Canada since the 1960s, but the nephrology NP role became established in the mid-1990s both in Canada and the United States (Nhan & Zuidema, 2007). The shift in prominence of the role coincided with a climate of limited resources, healthcare restructuring, and a focus on primary care delivery. The introduction and implementation of the NP role in various clinical settings have been associated with safe and efficacious care, and favourable patient outcomes in the domains of patient satisfaction, enhancing patient self-management, and improving continuity of care (Kilpatrick et al., 2010). An abundance of studies of the nurse practitioner role in renal management and HD clinics has demonstrated the importance of the role in healthcare delivery. In contrast, the current evidence base is devoid of studies regarding the delivery of psychiatry-integrated NP care within the HD sector locally and within North America. Statistical information from the College of Nurses of Ontario indicates that in 2014 there were only 29 nurse practitioners from among either an adult (460 NPs) or primary care (1,711 NPs) specialty who identified with a mental health/psychiatry focus, although none of the NPs among the census identified nephrology or HD as their primary area of practice (T. Iljon, College of Nurses of Ontario, personal communication, stats@cnomail.org, March 10, 2015).

THE CARE TEAM

Adult-specialty nurse practitioners have maintained a prominent role in the outpatient hemodialysis unit at St. Michael's Hospital in Toronto, Ontario, since 2006. They have been instrumental in providing longitudinal dialysis-related patient care within their scope of practice in collaboration with an attending nephrologist.

The HD unit delivers care to more than 240 patients over four HD shifts, 24 hours a day, six days a week. From Monday to Friday, each of the three nephrology NPs provides care to the cohort of patients in both the morning and afternoon of shifts with their collaborating nephrologists; patients undergoing hemodialysis in the evening and nocturnal shifts receive care either from a nephrologist or a nephrologist/NP team. The interdisciplinary team, which includes a dietitian and a pharmacist, routinely follows the care of all patients. A social worker, physiotherapist, and physiotherapy assistant commonly see patients on a referral basis.

The NP, nephrologist, and members of the interdisciplinary team collaborate in the management of chronic dialysis-related issues such as dry weight assessment, vascular access, dialysis adequacy, anemia management, and bone mineral metabolism. Acute patient concerns, which are usually identified by the HD nurse during the pre-dialysis assessment, are addressed by NPs during their dialysis rounds. Common concerns that require assessment that are not directly related to dialysis include non-volume-related shortness of breath, cough, chest pain, abdominal pain, and wounds. Concerns related to coping may arise when an unexpected event occurs and the patient feels that they are not managing well and that they need to sort out their thoughts and/or feelings. The junction at which this may occur includes when starting dialysis *de novo* or following failed renal transplant, following recurrent hospitalizations, with a new diagnosis of another chronic condition, or following the death of a family member, friend, or fellow dialysis patient.

When a patient is identified as having an issue that would benefit from psychiatry input, the HD NP/nephrologist team refers patients to Medical Psychiatry for consultation and intervention.

THE GAP

Hemodialysis clinicians have observed anecdotally that attendance to routine follow-up appointments by dialysis patients has been problematic. Patients commonly receive dialysis for four hours, three days a week. In general, many patients had difficulty attending an additional appointment because they forgot, did not have the energy, or had a scheduling conflict. As a result, patients often deferred psychiatric care rather than attend another scheduled appointment. If there was a heightened level of concern regarding a patient's mental health and safety, Medical Psychiatry was requested to assess a patient during dialysis at their earliest availability.

Overall, timely access to psychiatry assessment and related follow-up for patients during their outpatient HD visits has been challenging at St. Michael's Hospital due to finite resources within the mental health service. As mental health referral for HD patients was limited to only one psychiatrist, delays in patient assessment were further compounded. It was neither feasible nor sustainable for the attending psychiatrist to consult all patients on HD requiring mental health consultation.

The attending psychiatrist affiliated with St. Michael's Medical Psychiatry team identified this gap in service in April 2012 and initiated discussion with the hemodialysis NPs and the collaborating NP on Medical Psychiatry with respect to the options available to close this gap. Relevant healthcare team stakeholders from both programs were in agreement with bringing psychiatry-focused NP care to the forefront of the HD unit, as a way of meeting patient needs in a timelier manner. The role of the Medical Psychiatry Nurse Practitioner (MP NP) would be to promote: access to psychiatric assessment; continuity of care; appropriate referrals; and positive patient mental health outcomes. The MP NP, therefore, became the psychiatry point-of-care consultant for the HD unit. As a result of this care arrangement, psychiatry-focused NP care became integrated within the HD unit. From a service utilization perspective, this change was prudent, as national survey data indicate that 90% of patients afflicted with either primary mental health or substance use disorders (MH/SUDs) receive care in the general medical health sector and approximately two-thirds of these patients do not receive any treatment for their MH/SUDs (Wang et al., 2005).

PSYCHIATRY-INTEGRATED NURSE PRACTITIONER CARE

The notion of health care team professionals working collaboratively to address the mental health as well as the general medical care needs of their patients using evidenced-based research is the cornerstone of integrated care (Butler et al., 2008). Using this model of care, appropriate patients on HD are now able to obtain psychiatry integrated NP care at the right time and in the right place (i.e., within the HD unit) with an opportunity to accommodate for privacy issues as needed. There are many opportunities and benefits afforded by psychiatry-integrated NP care in the HD unit.

Medical Psychiatry or Consultation-Liaison (CL) Psychiatry, as described in its clinical guidelines, is a subspecialty of psychiatry that is concerned with patients who are medically/surgically ill. The "consultation" aspect denotes a request, whereas, the facilitation of knowledge and relationships is known as the "liaison" function, which is a prominent role of CL psychiatry (Leentjens et al., 2011).

The goals of psychiatric consultation in the medical/surgical setting are to:

1. Ensure the safety and stability of the patient within the medical environment;
2. Collect sufficient history and medical data from appropriate sources to assess the patient, and formulate the problem;
3. Conduct a mental status examination and neurological and physical examinations as necessary;
4. Establish a differential diagnosis; and
5. Initiate a treatment plan.

Psychiatry-related knowledge domains of the CL consultant include: psychiatric conditions and their relationship to comorbid medical conditions; psychotherapeutic interventions; psychotropic medications; and social, behavioural, and medico-legal aspects of mental health, medical illness, and hospitalization (Leentjens et al., 2011).

OPPORTUNITIES AND BENEFITS OF PSYCHIATRY-INTEGRATED NP CARE

Benefits of psychiatry-integrated care are numerous, as identified by Zeidler Schreiter et al. (2013). One prospective study that focused on an integrated psychiatry and psychology consultation model revealed that the "literature lacks robust, practical descriptions of… an integrated psychiatric consultation model in primary care with the psychiatrist routinely working in collaboration with both primary care clinicians (physicians and nurse practitioners), as well as other mental health providers (behavioral health consultants)" (Zeidler Schreiter et al., 2013, p. 1523). This study identifies that an integrated model is more pragmatic, as it eliminates additional travel time and related costs, improves access by removing barriers for harder-to-serve subpopulations, as care is provided in a familiar environment, and streamlines access to patient information. Efficient retrieval of current patient data fosters a relevant and accurate portrayal of the clinical situation and current plan, thereby reducing inappropriate prescribing and minimizing the potential for untoward side effects and adverse events from psychotropic medications.

Apart from practical advantages, there are instrumental clinical benefits in providing psychiatry-integrated care. These associated benefits include: increased collaboration; diagnostic clarification; recommendations for appropriate diagnostic testing and treatment options; ongoing psycho-education and behavioural recommendations; community referrals; and reciprocal learning (Zeidler Schreiter et al., 2013). Additional downstream benefits include decreased healthcare costs underscored by Katon, Roy-Bryne, Russo, and Cowley's study, as well as improved

patient outcomes as indicated by Hunkeler et al.'s study, (both cited in Zeidler Schreiter et al., 2013, p. 1525).

Psychiatry-integrated NP care has the capacity to create opportunities for change and improvement to patient outcomes by virtue of its unique role. The MP NP's role in the context of CL is unique in that it is a liaison to nursing and allied health, serves to enhance communication between team members, improves flow between and within systems, ameliorates factors that impact patients' response to psychiatric conditions, and addresses complexity. The concept of complexity is divided into two major components: (1) the complexity of the clinical situation, and (2) the complexity of the care required (De Jonge, Huyse, & Stiefel, 2006).

The complexity of the patient situation and requisite care pertain to the interplay of numerous factors, which may include medical co-morbidities, psychosocial considerations such as interpersonal and team dynamics, degree of service utilization, intensity of resource management (e.g., obtaining information known as collateral from individuals who are well known to a patient, issuing of mental health act forms), involvement of multiple stakeholders, and education or support to either patients, family, or healthcare staff (Kathol et al., 2009). There is an inherent need for the MP NP to address such complexities, as the subset of psychiatry consultation patients comprise the largest proportion of complex patients (70%), followed by patients with diabetes (50%) and patients on dialysis (30%) (Huyse, 2009).

The various roles of the MP NP can be broadly applied within HD. Of prime importance, the MP NP is able to establish and develop rapport with patients while following their progress longitudinally. Through this experience, the MP NP is able to provide support, empowerment, and insights that may not be given by the hemodialysis NPs or other interdisciplinary clinicians within HD by virtue of their non-psychiatry backgrounds. Primary medical clinicians and nephrologists only receive marginal training in the diagnosis and treatment of mental health and substance use disorders during their medical school training (Leigh, Stewart, & Mallios, 2006). Adult-specialty NPs, as a group, have not received any formal or standardized education on mental health or substance use disorders via graduate level academic preparation and/or credentialing to date. By providing mental health coverage from the lens of an MP NP, the relative psychiatric needs of the patients on HD are being addressed in a readily accessible and consistent manner.

The MP NP is employed as a full-time salary-based staff position whose funding is allocated from an internal budget from the hospital's Mental Health Service, as opposed to a fee-for-service funding received by physicians. MP NP coverage of HD varies according to consultation volumes, patient status, and the level of support provided to staff, as well as patients and their family members. At the inception of the integrated model, the MP NP dedicated two full days a week in order to complete the backlog of new consultations. After the initial group of new consults were completed, the MP NP was generally available for two half days a week for follow-ups and any new consultation requests.

The MP NP consults with a psychiatrist colleague when a second opinion is requested or when clinical direction or management required is beyond the NP's scope of practice such as prescription of benzodiazepines. Ongoing collaboration between the MP NP and community providers such as family physicians, case managers, and community agency personnel is undertaken to provide tailored mental health recommendations and to enhance individual functioning and quality of life. A summary of key demographic, clinical, diagnostic, and dialysis vintage information of patients consulted by the MP NP is provided in Figures 1 and 2.

The initial year of the MP NP's practice in HD (May 2012–April 2013) revealed prevalence rates that are consistent with the literature in terms of depressive disorders.

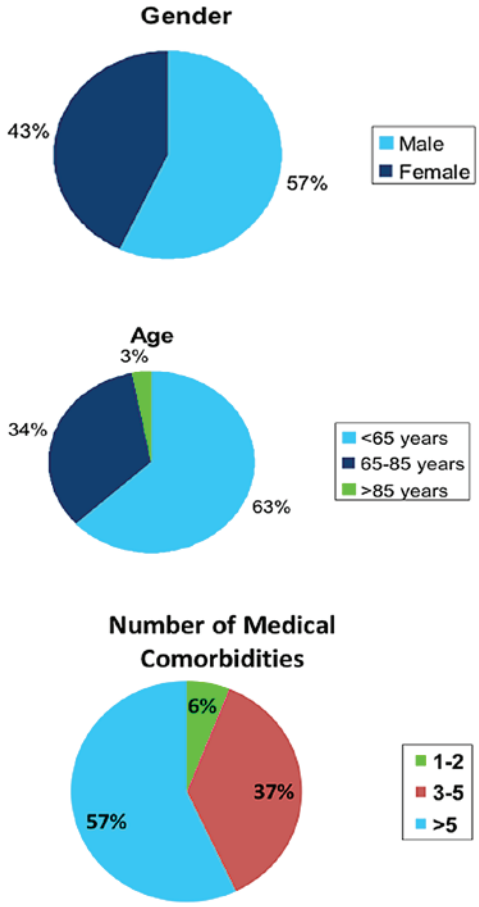

Figure 1: Demographic features of patients on hemodialysis

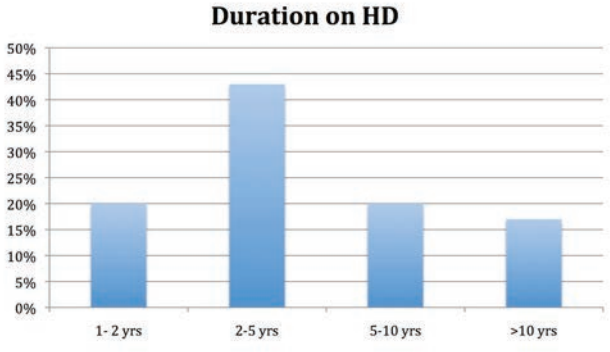

Figure 2: Duration on hemodialysis

Although objective findings on mental status exam, as well as information from HD staff and from collateral sources were considered, diagnosis at that time was guided by criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000). Within a corresponding caseload of both prevalent and incident HD patients (n=35), 11 patients (31%) received a diagnosis of major depressive disorder (MDD) and 10 patients (29%) received a diagnosis of dysthymia, which is a milder form of depression (APA, 2000). Persistent depressive disorder, which is a consolidation of chronic major depressive disorder and dysthymia, as defined in the DSM-IV, has now replaced the dysthmia diagnosis according to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-V*; APA, 2013). It is apparent that a substantial need exists for psychiatry-integrated NP care, as 60% of newly consulted patients were affected by depression (MDD) (31%) and dysthymia (29%), as depicted in Figure 3. Findings from this cohort significantly exceed the prevalence rate (9%) of depressive disorders that is found in the general population (Kessler et. al., 2005); however, these findings are consistent with Zalai et al.'s (2012) assertion that the prevalence of depression in ESKD is approximately four times the rate of depression in the general population. This presents a significant opportunity for psychiatry-integrated NP care to screen for, diagnose and treat depression, as well as provide support and related health promotion.

Insomnia is another common condition that affects individuals who receive HD. However, there is a paucity of research concerning the related prevalence and risk factors for patients on HD (Novak, Shapiro, Mendelssohn, & Mucsi, 2006). Novak et al. (2006) note in their review of the diagnosis of sleep disorders that studies to date suggest that insomnia is substantially more prevalent in dialysis patients than in the general population. However, these earlier studies were flawed by small sample sizes, and the majority of them relied on non-validated tools to identify patients with insomnia. Large epidemiologic studies aimed at identifying patients in the general population who fulfill the diagnostic criteria for chronic insomnia, as outlined by the DSM-IV or the Athens Insomnia Scale (AIS), suggest a comparable 6 to 9% prevalence rate of insomnia in generally healthy adult populations in different countries (Ohayon, as cited in Novak et. al., 2006, p. 27). Insomnia is 1.5 to 2 times more prevalent in women than in men in the general population, and is also associated with socio-economic

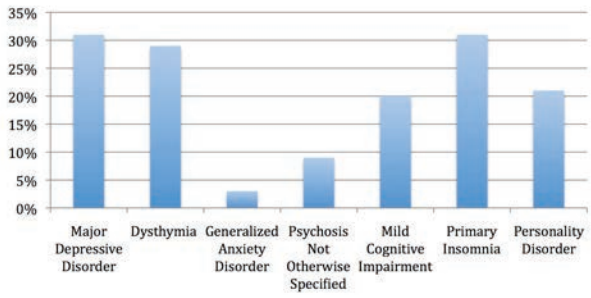

Figure 3: Psychiatric diagnoses. Diagnoses based on criteria by APA, 2000, *Diagnostic and Statistical Manual of Mental Disorders*, (4th ed. text rev.). Washington, DC: Author.

Figure 3: Psychiatric diagnoses

status and clinical complexity, including coexisting psychiatric and medical conditions such as chronic pain, restless leg syndrome (RLS), periodic limb movement syndrome (PLMS), and obstructive sleep apnea (OSA) (Novak et al., 2006).

The initial year of the MP NP's practice in the HD unit revealed that among a patient caseload (n=35), 11 patients who represented 31% of those being followed by psychiatry suffered from insomnia (Figure 3). As such, the opportunity to diagnose insomnia, reinforce sleep hygiene measures, and provide appropriate pharmacotherapy is an essential strategy that the MP NP can integrate within the care of patients on HD.

Although the diagnostic, treatment, and monitoring functions provided by the MP NP are essential to enhancing the mental health outcomes of patients, an additional and significant opportunity exists for supporting how the healthcare team members react to patients. Personality disorder traits, particularly antisocial or impulsive, and narcissistic and borderline personality disorder traits have the potential to create challenges, disrupt the milieu of the clinical setting, and engender negative emotions among the HD team members. In this context, the expertise of the MP NP can be utilized effectively, as nursing staff in general medical settings may have limited knowledge and skill in order to institute interventions for patients such as behavioural limit setting and/or provide support to patients dealing with psychosis or depression (Kathol et al., 2009). As such, the MP NP may play a pivotal role in facilitating a team approach by promoting key strategies for working with dialysis patients who present with challenging behaviour. These strategies can be divided into those that are patient-related and those that are staff-related (Schwartz & Batson, 2000). Patient-specific strategies include: identifying the patient's perspective and goals; providing education that promotes informed consent; maximizing individual participation; building on strengths; and incorporating a behavioural contract that specifies what and when things need to be done by the patient and the renal team. Staff-related strategies incorporate broad principles that include therapeutic communication, conflict resolution, non-violent crisis prevention and intervention, as well as ethical decision-making and legal involvement (Schwartz & Batson, 2000).

Through the collaborative process of providing support, the MP NP is in a pivotal position to create opportunities for mutual dialogue amongst healthcare team members. Discussion of patient-related issues allows the MP NP to validate team members' thoughts, feelings, and their concerns related to aspects of psychiatry-integrated care for their mutual patients. At times, the most effective answer in terms of how to approach a particular patient situation may not be readily apparent. In these cases, the focus of clinical attention may involve supporting the HD team by continuing a dialogue with them, as opposed to finalizing a treatment plan. The MP NP can provide a forum to discuss and debrief relevant issues with the healthcare team and hear their perspectives regarding patients who have been referred for psychiatry consultation. Informal feedback from the HD team reveals that this transactional process has been beneficial, as HD team members perceive that their concerns, as well as those of mutually cared for patients, have been validated.

Although psychiatry-integrated NP care renders many benefits and opportunities, as previously discussed, there are unique challenges that occur within this context.

UNIQUE CHALLENGES OF PSYCHIATRY-INTEGRATED NP CARE

Psychiatric issues such as neurocognitive disorders, amnestic disorders, mood and anxiety disorders, and substance use disorders, as well as psychosis, personality dysfunction, and behavioural dysregulation may impair a patient's ability to process, encode, retain and retrieve information. Patients attending HD may not recall that the main focus of the MP NP's role involves psychiatric management, as opposed to their general medical/nephrology care. Consequently, the issue of role clarity in terms of the MP NP may arise for necessary clarification. In addition, facilitation of rapport building with patients may prove to be more challenging in the face of psychosis/paranoid ideation, as well as neurocognitive and personality disorders. Lastly, depending on workload volumes, balancing the demands of other clinical duties with HD coverage may pose a challenge at times.

CONCLUSION

The introduction of psychiatry-integrated NP care within the collaborative, multidisciplinary setting of the HD unit at St. Michael's Hospital, where the NP role was already well-established, has bridged a gap to ensure that the right patients obtain the right care at the right place and at the right time. St. Michael's Hospital can be recognized as a pioneer in terms of introducing a paradigm shift of psychiatry-integrated NP care, as this is considered a novel practice within the local HD sector. The benefits and opportunities arising from psychiatry-integrated NP care are numerous, and they outweigh specific challenges that may accompany the role. The opportunity exists for this model of care to be adopted by other HD units, as well as alternate treatment settings that care for patients with chronic conditions. Finally, initial research opportunity exists with a focus on quality initiatives containing a survey to evaluate the impact of the Medical Psychiatry NP role on patient care within the hemodialysis setting.

REFERENCES

American Psychiatric Association (APA). (2000). *Diagnostic and statistical manual of mental disorders,* (4th ed., text rev.). Washington, DC: Author.

American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Butler M., Kane, R.L.L., McAlpine, D., Kathol, R.G., Steven, S.F., Hageborn, H., & Wilt, T.J. (2008). Integration of mental health/substance abuse and primary care. *Evidence Report/ Technology Assessment*, *173*.

Canadian Nurses Association (CNA). (2010). *Canadian nurse practitioner core competency framework*. Ottawa: Author.

Cukor, D., Coplan, J., Brown, C., Peterson, R.A., & Kimmel, P.L. (2008). Course of depression and anxiety diagnosis in patients' treatment with hemodialysis: A 16-month follow-up. *Clinical Journal of the American Society of Nephrology, 3*(6), 1752–1758.

De Jonge, P., Huyse, F.J., &, Stiefel, F.C. (2006). Case and care complexity in the medically ill. *Medical Clinics of North America, 90*, 679–692.

Huyse, F. (2009). Psychiatrists for medically complex patients: Bringing value at the physical health and mental health/ substance-use disorder interface. *Psychosomatics*, *50*(2), 93–107.

Kadri, A., Blackmer, J., & Ibrahim, M. (2014). Obtaining consent for a life sustaining treatment for a patient with a major psychiatric illness. *Canadian Medical Association Journal, 186*(14), 1087–1089.

Kathol, R.G., Kunkel, E.J., Weiner, J.S., McCarron, R.M., Worley, L.L, Yates, W.R., ... Huyse, F.J. (2009). Psychiatrists for medically complex patients: Bringing value at the physical health and mental health/substance-use disorder interface. *Psychosomatics*, *50*(2), 93–107.

Kessler, R.C., Chiu, W.T., Demler, O., Merikangas, K.R., & Walters, E.E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*(6), 617–627.

Kilpatrick, K., Harbman, P., Carter, N., Martin-Misener, R., Bryant-Lukosis, D., Donald, F., Kaasalainen, S., Bourgeault, I., & DiCenso, A. (2010). The acute care nurse practitioner role in Canada. *Nursing Leadership*, *23*, 114–131.

Leentjens, A.F., Rundell, J.R., Wolcott, D.L., Guthrie, E., Kathol, R., & Diefenbaker, A. (2011). Reprint of: Psychosomatic medicine and consultation liaison psychiatry: Scope of practice, processes and competencies for psychiatrists working in the field of Consultation Liaison psychiatry or psychosomatics. A consensus statement of the European Association of Consultation Liaison Psychiatry and Psychosomatics (EACLPP) and the Academy of Psychosomatic Medicine (APM). *Journal of Psychosomatic Research, 70*, 486–491.

Leigh, H., Stewart, D., & Mallios, R. (2006). Mental health and psychiatry training in primary care residency programs, part II: What skills and diagnoses are taught, how adequate, and what affects directors' satisfaction? *General Hospital Psychiatry, 28*, 195–204.

Nhan, J., & Zuidema, S. (2007). Nurse practitioners in the Northern Alberta Renal Program. *Canadian Association of Nephrology Nurses and Technologists Journal, 17*(2), 48–50.

Novak, M., Shapiro, C.M., Mendelssohn, D., & Mucsi, I. (2006). Diagnosis and management of insomnia in dialysis patients. *Seminars in Dialysis, 19*(1), 25–31.

Schwartz, M., & Batson, H. (2000). Understanding the psyche of the disruptive patient in the dialysis facility. *Nephrology News Issues, 14*, 40–43.

Wang, P.S., Berglund, P., Olfson, M., Pincus, H.A., Wells, K.B., & Kessler, R.C. (2005). Failure and delay in initial treatment contact after first onset of mental disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*, 603–613.

Zalai, D., Szeifert, L., & Novak, M. (2012). Psychological distress and depression in patients with chronic kidney disease. *Seminars in Dialysis, 25*(4), 428–438.

Zeidler Schreiter, E.A., Pandhi, N., Fondow, M.D., Thomas, C., Vonk, J., Reardon, C.L., & Serrano, N. (2013). Consulting psychiatry within an integrated primary care model. *Journal of Health Care for the Poor and Underserved, 24*, 1522–1530. doi:10.1353/hpu.2013.0178

CONTACT HOUR: 2.0 HRS

Acute kidney injury secondary to lymphoma

By Patwant Dhillon and Marisa Battistella

INTRODUCTION

Onco-nephrology is a new and evolving clinical entity that highlights the importance of the interaction between cancer and kidney disease. Patients with cancer are known to have an increased risk of developing acute kidney injury (AKI) due to the malignancy or its associated treatments, which can ultimately lead to chronic kidney disease. Many antineoplastic medications used to treat cancer can cause renal disease and certain malignancies have also been linked to kidney injury, such as lymphoma.

The development of cancer-associated kidney complications is associated with poor prognosis (Darmon, Ciroldi, Thiery, Schlemmer, & Azoulay, 2006; Kitai, Matsubara, & Yanagita, 2015). Among critically ill patients with cancer, 12% to 49% experience acute renal failure and 9% to 32% require renal replacement therapy (Darmon et al., 2006). Among these patients, acute renal dysfunction commonly occurs in the context of multiple organ dysfunction and is associated with 72% to 85% mortality rates (Darmon et al., 2006). Another study reported that AKI conferred a six-month mortality of 73% in this patient population (Soares et al., 2006). Therefore, there is growing emphasis on understanding the diagnosis and management of cancer-associated kidney complications. This article will review the pathophysiology of acute kidney injury caused by lymphoma.

LYMPHOMA

Lymphoma is a hematological malignancy that develops due to the abnormal growth of lymphocytes found within the lymphatic system. Genome-wide molecular profiling has revealed subtypes of lymphoma that originate from lymphocytes differing in development stage (Lenz & Staudt, 2010). The two main subtypes of lymphoma are Hodgkin's lymphoma and non-Hodgkin's lymphoma.

Hodgkin's lymphoma is the most common cancer in adolescents and younger adults with an incidence rate of three per 100,000 person-years (Carbone, Gloghini, Castagna, Santoro, & Carlo-Stella, 2015). Hodgkin's lymphoma can be classified into classical Hodgkin's lymphoma, which accounts for 95% of all cases, and the less common nodular lymphocyte-predominant Hodgkin's lymphoma (Armitage, 2010; Carbone et al., 2015; Connors, 2005). Classical Hodgkin's lymphoma is a B-cell malignancy characterized by the presence of Hodgkin and Reed-Sternberg cells (Carbone et al., 2015). Hodgkin's lymphoma often presents as painless swelling of lymph nodes, persistent fatigue, fever and chills, and unexplained weight loss (Armitage, 2010; Connors, 2005). Cure rates approaching 80% have been achieved in patients with advanced-stage disease undergoing first-line chemotherapy and radiation. In patients with late-relapsing and refractory Hodgkin's lymphoma, responses have been achieved with salvage high-dose chemotherapy and autologous stem cell transplantation (Armitage, 2010; Carbone et al., 2015; Connors, 2005).

Non-Hodgkin's lymphomas use the regulatory biologic features of normal cells for their own malignant purpose, and thus, their function depends largely on the differentiation state of the cells from which they originate (Lenz & Staudt, 2010). There are over 30 types of non-Hodgkin's lymphoma, the most common form being diffuse large-B-cell lymphoma, which accounts for 30 to 50% of newly diagnosed lymphomas (Lenz & Staudt, 2010). Presentation and treatment modalities for non-Hodgkin's lymphoma are similar to those for Hodgkin's lymphoma. More than 90% of patients with early stage non-Hodgkin's lymphoma are cured with chemotherapy and radiation; however, long-term survival for those with refractory or relapsed disease is only 20% (Barth, Chu, Hanley, & Cairo, 2016).

Hodgkin's and non-Hodgkin's lymphomas can start almost anywhere in the body, usually in a group of lymph nodes in one part of the body that then spreads. Eventually, lymphomas can metastasize to almost any tissue or organ in the body through the lymphatic system or bloodstream (Armitage, 2010; Lenz & Staudt, 2010). Many case reports have been published describing cases of AKI secondary to lymphoma.

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ACUTE KIDNEY INJURY

Acute kidney injury due to hematologic malignancies, such as leukemia and lymphoma, is common. In a prospective, multicentre, cohort study of 1,411 intensive care unit patients, the diagnosis of lymphoma or leukemia had the greatest risk for AKI (OR 2.23, p = 0.04) relative to other factors such as infection, cirrhosis, and cardiovascular disease (de Mendonça et al., 2000). The diagnosis of lymphoma or leukemia also had the greatest risk of death (OR 2.31, p = 0.04) in all AKI patients (de Mendonça et al., 2000). Patients presenting with AKI in the setting of lymphoma may have pre-renal, renal, or post-renal etiologies (Luciano & Brewster, 2014). Table 1 describes the potential etiologies of AKI in lymphoma patients.

PRE-RENAL ACUTE KIDNEY INJURY

Pre-renal AKI is the most common kidney injury in lymphoma (Luciano & Brewster, 2014). Volume depletion due to poor oral intake, emesis, and diarrhea contribute to pre-renal AKI (Kitai et al., 2015; Luciano & Brewster, 2014). Reduced kidney perfusion may also occur due to comorbidities, such as heart failure and cirrhosis, or medications that affect kidney afferent and efferent tone such as nonsteroidal anti-inflammatory medications (Luciano & Brewster, 2014). According to the type of volume depletion, the severity of fluid deficit, and patient signs and symptoms, oral or parenteral fluid can be given (Sarhill, Walsh, Nelson, & Davis, 2001).

RENAL ACUTE KIDNEY INJURY

Renal AKI caused by lymphoma can be subdivided into ischemic and non-ischemic acute tubular necrosis (ATN), tubulointerstitial disorders, renovascular disorders, and glomerulopathies (Luciano & Brewster, 2014). Diagnosis of renal AKI is dependent upon diagnostic imaging, urine sediment examination, and biopsy (Luciano & Brewster, 2014). Examination of urine sediment is often considered critical for diagnosis. The presence of renal tubular epithelial cells and casts indicates ATN; white cells and casts suggest infiltration or interstitial nephritis; and red blood cells and casts may indicate glomerulopathy (Luciano & Brewster, 2014).

Acute tubular necrosis is the most common renal AKI seen in lymphoma patients, with lysozyme-induced tubular necrosis and tumour lysis syndrome being common etiologies (Luciano & Brewster, 2014). Lysozyme is freely filtered by the glomerulus and reabsorbed by the

Table 1: Etiologies of Acute Kidney Injury in Lymphoma

Pre-renal	Intravascular volume depletion
	Nausea, emesis, diarrhea
	Hemorrhage
	Reduced kidney perfusion
	Vasoconstriction
	Sepsis
	Liver disease
	Medications (diuretics, nonsteroidal anti-inflammatory drugs)
Renal	Acute tubular necrosis
	Kidney ischemia
	Tumour lysis syndrome
	Medications (acetaminophen, nonsteroidal anti-inflammatory drugs, aminoglycosides)
	Tubulointerstitial disorders
	Secondary kidney infiltration
	Primary kidney lymphoma
	Glomerular disorders
	Amyloidosis
	IgA nephropathy
	Renovascular disorders
	Renal vein thrombosis
	Thrombotic microangiopathy
Post-Renal	Obstruction
	Exterior compression (lymphadenopathy, obstructing tumour)
	Internal obstruction (nephrolithiasis, crystalluria)

**Adapted from Luciano & Brewster (2014).*

proximal tubule cells, and at the high concentrations seen in lymphoma, lysozyme induces direct tubular damage (Luciano & Brewster, 2014). Treatment for lymphoma will decrease lysozyme production and improve AKI. Direct tubular damage may also occur secondary to tumour lysis syndrome due to the accumulation of uric acid crystals in renal tubules, renal vasoconstriction, and the release of pro-inflammatory cytokines in the renal interstitium (Kitai et al., 2015; Luciano & Brewster, 2014). Prevention of tumour lysis syndrome with hydration and/or direct xanthine oxidase inhibitors such as allopurinol is recommended (Kitai et al., 2015; Luciano & Brewster, 2014).

Acute kidney injury may also occur due to kidney infiltration by lymphoma, with the rate of infiltration dependent upon the stage and grade of disease (Luciano & Brewster, 2014). The kidney is the most common extranodal site for metastatic lymphoma, and involvement is typically diffuse, bilateral, and symmetrical (Obrador, Price, O'Meara, & Salant, 1997). In one autopsy study with 700 lymphoma patients, kidney infiltration was seen in 34% of patients (Obrador et al., 1997; Richmond, Sherman, Diamond, & Craver., 1962). Although kidney infiltration is fairly common, AKI from infiltration is rare and is seen in less than 1% of cases (Luciano & Brewster, 2014). Patients with kidney infiltration may present with flank pain, hematuria, hypertension, or abdominal distension (Luciano & Brewster, 2014; Obrador et al., 1997). AKI due to kidney infiltration often responds dramatically to lymphoma treatment with serum creatinine concentrations returning to normal within one to four weeks (Obrador et al., 1997).

Renovascular causes of AKI may include renal vein thrombosis and thrombotic microangiopathy (TMA). Several factors in lymphoma may contribute to kidney vasculature thrombosis, such as leukostasis, malignancy-associated nephrotic syndrome, and treatments that activate the clotting cascade (Luciano & Brewster, 2014). TMA results from intravascular platelet activation and formation of platelet-rich thrombi (Kitai et al., 2015). Most cases of lymphoma-associated TMA have been with disseminated cancer and poor prognosis.

Glomerulopathies have also been described in lymphoma, with the most common glomerular lesion associated with Hodgkin's and non-Hodgkin's lymphomas being minimal change disease (Luciano & Brewster, 2014). It is hypothesized that minimal change disease results from immune cell dysfunction with abnormal cytokine production and secretion by T-cells and the release of a glomerular permeability factor (Kitai et al., 2015; Luciano & Brewster, 2014). Glomerulopathies in Hodgkin's lymphoma occur later in the disease without correlation to progression, whereas glomerulopathies in Non-Hodgkin's lymphoma occur earlier and progress with disease (Luciano & Brewster, 2014). As with other forms of AKI in lymphoma, glomerulopathies can be treated with successful treatment of the malignancy.

POST-RENAL ACUTE KIDNEY INJURY

In patients with lymphoma, obstruction may result from direct compression of ureteral outflow by tumour or lymph nodes, retroperitoneal fibrosis, or nephrolithiasis from tumour lysis syndrome (Luciano & Brewster, 2014). Often with obstructive AKI, urine output is stable, but anuric kidney failure should raise concerns for bilateral obstruction, although this is a rare occurrence (Luciano & Brewster, 2014). In 1974, Abeloff and Lenhard reviewed 384 cases of lymphoma and found obstructive uropathy in 7.1% of patients, with less than 50% of the patients with ureteral obstruction having signs and symptoms related to the urinary tract. Signs and symptoms of obstruction may include oliguria, weakness, and flank pain, and a kidney ultrasound often demonstrates hydronephrosis (Mekori, Steiner, Bernheim, Manor, & Klajman, 1984). Decompression with nephrostomy tubes may prevent permanent injury (Luciano & Brewster, 2014).

CASE REPORTS

Various case reports have been published detailing etiologies of AKI in lymphoma patients. One retrospective study by Da'as et al. (2001) reported 66 patients with lymphoma out of 700 who experienced

Table 2: Renal Failure Etiologies

Cause	No. of patients
Direct effects (lymphoma)	19
Infiltration of kidney	5
Obstruction	14
Indirect effects (paraneoplastic)	7
Glomerulonephritis	4
Paraprotienemia	1
Cryoglobulinemia	2
Therapy-related	15
Tumour lysis syndrome	4
Cytoxan-induced cystitis	4
Infection/nephrotoxic drugs	7
Unrelated to lymphoma	13
Unknown	12

(Da'as et al., 2001)

renal failure. The causes of renal failure are detailed in Table 2. The authors describe indirect causes of renal disease, such as obstruction or therapy-related toxicities, as being the most common causes of AKI in lymphoma patients. Da'as et al. also describe unique cases of renal failure. One case involved a 52-year-old man with mantle cell lymphoma presenting with acute renal failure, splenomegaly, and mesenteric lymphadenopathy. Urine analysis revealed telescopic sediment, and kidney biopsy showed diffuse proliferative glomerulonephritis. The patient was treated with corticosteroids, cyclophosphamide, and doxorubicin. On follow-up, the patient's kidney function returned to normal.

CONCLUSION

This article introduces the pathophysiology of AKI secondary to lymphoma. Acute kidney injury secondary to lymphoma is common and encompasses pre-renal, renal, and post-renal etiologies. Not only does AKI in cancer patients increase the risk of mortality, but patients with impaired renal function are at risk of delayed life-saving therapy or experiencing drug toxicity due to drug or metabolite accumulation. As the risk of renal disease continues to be a growing concern amongst cancer patients, nephrologists and oncologists must continue to work collaboratively to treat lymphoma while also preventing and treating kidney injury.

REFERENCES

Abeloff, M.D., & Lenhard, R.E. (1974). Clinical management of ureteral obstruction secondary to malignant lymphoma. *Johns Hopkins Medical Journal,134*(1), 34–42.

Armitage, J.O. (2010). Early-stage Hodgkin's lymphoma. *New England Journal of Medicine, 363*(7), 653–62. doi:10.1056/NEJMra1003733

Barth, M.J., Chu, Y., Hanley, P.J., & Cairo, M.S. (2016). Immunotherapeutic approaches for the treatment of childhood adolescent and young adult non-Hodgkin lymphoma. *British Journal of Haematology, 173*(4), 597–616. doi:10.1111/bjh.14078

Carbone, A., Gloghini, A., Castagna, L., Santoro, A., & Carlo-Stella, C. (2015). Primary refractory and early-relapsed Hodgkin's lymphoma: Strategies for therapeutic targeting based on the tumour micrenvironment. *Journal of Pathology*, *237*(1), 4–13. doi:10.1002/path.4558

Connors, J.M. (2005). State-of-the-art therapeutics: Hodgkin's lymphoma. *Journal of Clinical Oncology, 23*(26), 6400–6408. doi:10.1200/JCO.2005.05.016

Da'as, N., Polliack, A., Cohen, Y., Amir, G., Damon, D., Kleinman, Y., … Ben-Yehuda, D. (2001). Kidney involvement and renal manifestations in non-Hodgkin's lymphoma and lymphocytic leukemia: A retrospective study in 700 patients. *European Journal of Haematology*, *67*(3), 158–164. doi:10.1034/j.1600-0609.2001.5790493

Darmon, M., Ciroldi, M., Thiery, G., Schlemmer, B., & Azoulay, E. (2006). Clinical review: Specific aspects of acute renal failure in cancer patients. *Critical Care, 10*(2), 211. doi:10.1186/cc4907

de Mendonça, A., Vincent, J.L., Suter, P.M., Moreno, R., Dearden, N.M., Antonelli, M., … Cantraine, F. (2000). Acute renal failure in the ICU: Risk factors and outcome evaluated by the SOFA score. *Intensive Care Med, 26*(7), 915–921.

Kitai, Y., Matsubara, T., & Yanagita, M. (2015). Onconephrology: Current concepts and future perspectives. *Japanese Journal of Clinical Oncology*, *45*(7), 617–28. doi:10.1093/jjco/hyv035

Lenz, G., & Staudt, L.M. (2010). Aggressive lymphomas. *New England Journal of Medicine, 362*(15), 1417–29. doi:10.1056/NEJMra0807082

Luciano, R.L., & Brewster, U.C. (2014). Kidney involvement in leukemia and lymphoma. *Advances in Chronic Kidney Disease*, *21*(1), 27–35. doi:10.1053/j.ackd.2013.07.004

Mekori, Y., Steiner, Z. P., Bernheim, J., Manor, Y., & Klajman, A. (1984). Acute anuric bilateral ureteral obstruction in malignant lymphoma. *American Journal of the Medical Sciences, 287*(1), 70–73.

Obrador, G.T., Price, B., O'Meara, Y., & Salant, D.J. (1997). Acute renal failure due to lymphomatous infiltration of the kidneys. *Journal of the American Society of Nephrology*, *8*(8), 1348–1354.

Richmond, J., Sherman, R.S., Diamond, H.D., Craver, L.F. (1962). Renal lesions associated with malignant lymphomas. *American Journal of the Medical Sciences*, *32*, 184–207.

Sarhill, N., Walsh, D., Nelson, K., & Davis, M. (2001). Evaluation and treatment of cancer-related fluid deficits: Volume depletion and dehydration. *Support Care in Cancer*, *9*(6), 408–419. doi:10.1007/s005200100251

Soares, M., Salluh, J., Carvalho, M., Darmon, M., Rocco, J.R., & Spector, N. (2006). Prognosis of critically ill patients with cancer and acute renal dysfunction. *Journal of Clinical Oncology,* 24(24), 4003–10. doi:10.1200/JCO.2006.05.7869

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

Acute kidney injury secondary to lymphoma

By Patwant Dhillon and Marisa Battistella

1. The development of cancer-associated kidney complications:
   a) Is associated with poor prognosis
   b) Is associated with good prognosis
   c) Has a mortality rate of <5%
   d) Is not an area of concern for oncologists

2. Lymphoma is a:
   a) Type of myeloma occurring commonly in the elderly
   b) Hematologic malignancy that develops due to abnormal growth of lymphocytes
   c) Hematologic malignancy that develops due to abnormal growth of blasts
   d) Skin infection

3. The two main subtypes of lymphoma are:
   a) Breast and prostate cancer
   b) Acute myeloid leukemia and chronic myeloid leukemia
   c) Hodgkin's and non-Hodgkin's
   d) Myeloma and follicular lymphoma

4. Classical Hodgkin's lymphoma is a B-cell malignancy characterized by the presence of which cells:
   a) Hodgkin and Fleming cells
   b) Hodgkin and Reed-Sternberg cells
   c) Merkel cells
   d) Follicular cells

5. Which type of acute kidney injury is the most common in lymphoma patients?
   a) Pre-renal
   b) Renal
   c) Post-renal

6. Which of the following statements regarding renal acute kidney injury secondary to lymphoma are NOT true?
   a) Renal acute kidney injury is commonly caused by volume depletion due to poor oral intake, emesis, and/or diarrhea
   b) Renal acute kidney injury can be subdivided into ischemic and non-ischemic acute tubular necrosis, tubulointerstitial disorders, renovascular disorders, and glomerulopathies
   c) Acute tubular necrosis may be caused by lysozyme-induced tubular necrosis and tumour lysis syndrome
   d) Renal acute kidney injury may occur due to kidney infiltration

7. Which of the following statements is NOT true?
   a) Obstruction leading to post-renal acute kidney injury may occur due to retroperitoneal fibrosis
   b) Glomerulopathies have been described in lymphomas with the most common being minimal change disease
   c) Acute kidney injury due to kidney infiltration of lymphoma can be treated with hydration
   d) Tumour lysis syndrome can be prevented with hydration and direct xanthine oxidase inhibitors

8. Renovascular causes of acute kidney injury in lymphoma include:
   a) Renal vein thrombosis and thrombotic microangiopathy
   b) Kidney infiltration by lymphoma
   c) Dehydration
   d) Tumour lysis syndrome

9. Medications that can directly cause reduced kidney perfusion include:
   a) Diuretics
   b) Opioids
   c) Benzodiazepines
   d) Laxatives

10. Which of the following statements about acute kidney injury secondary to kidney infiltration by lymphoma is NOT true?
    a) Kidney involvement is typically diffuse, bilateral, and symmetrical
    b) Acute kidney injury from infiltration is common at >20%
    c) Symptoms include flank pain, hematuria, hypertension, abdominal distension
    d) Acute kidney injury due to kidney infiltration often responds dramatically to lymphoma treatment

CONTINUING EDUCATION STUDY ANSWER FORM

CE: 2.0 HRS CONTINUING EDUCATION

Acute kidney injury secondary to lymphoma

Volume 27, Number 1

By Patwant Dhillon and Marisa Battistella

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7.	a	b	c	d
8.	a	b	c	d
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❑ 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

I am at present studying toward

Nursing	*Non-Nursing*
❑ Specialty Certificate	❑ Specialty Certificate
❑ 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
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- ✓ Be willing to work within parliamentary procedure, which is used to ensure an efficient and fair voting procedure by self-governing organizations.
- ✓ Will submit a National Officer Candidate Information Form available online at **www.cannt.ca** or from the National Office (see address below).

BENEFITS TO BOARD MEMBERSHIP

- Having a DIRECT VOICE in how YOUR Association is run.
- Complimentary registration for the annual conference, with travel and accommodations covered as well!
- CNA recognition of a professional committee membership/participation (executive of a specialty association) and 25 hours can be claimed annually toward certification hours.

POSITION DESCRIPTIONS:

1. **Vice-President Atlantic:** Regional Vice-President: Elected by membership for a three-year period. Promotes and facilitates the goals and objectives of the Association throughout the region. The Vice-President represents his or her region's concerns and acts as a liaison between the Board of Directors and the membership.
2. **Vice-President Quebec:** Regional Vice-President: Elected by membership for a three-year period. Promotes and facilitates the goals and objectives of the Association throughout the region. The Vice-President represents his or her region's concerns and acts as a liaison between the Board of Directors and the membership.

For more information and forms for candidates and nominations, see **www.cannt.ca** under Members — Call for Nominations for the CANNT Board of Directors.

CANNT
PO Box 10, 59 Millmanor Place
Delaware, ON, N0L 1E0
Telephone: (519) 652-6767
Toll Free: (877) 720-2819
Fax: (519) 652-5015
Email: **cannt@cannt.ca**

NOMINATING FORM

Position:

_____

Name of Candidate:

_____

Membership Number:

_____

Nominated by*:
1. Name:

_____

2. Membership Number:

_____

**Nominations can only be made by current members.*

***I agree to let my name stand for office and if elected, I agree to serve my term of office.*

_____
Signature of candidate**

Date: _____

Connect with CANNT!

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

519-652-5015

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

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