

Volume 23, Issue 3

## July-September 2013

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# **14** A renal nursing professional practice model: The next generation

Lori Harwood, RN, PhD(c), CNeph(C), Linda Downing, RN, CMSN(C), and Jane Ridley, RN, MScN, CNeph(C)

## **20** CONTINUING EDUCATION SERIES

The connection between neurosciences and dialysis: A quick neurological assessment for hemodialysis nurses Charlotte McCallum, NP-Adult; MN; CNeph(C), and Margaret Leonard, RN

## 29 CONTINUING EDUCATION SERIES Pain assessment and management in hemodialysis patients

Charisse De Castro, PharmD Student, Laura Murphy, PharmD, and Marisa Battistella, BScPhm, PharmD, ACPR

# PD Start Strong

Peritoneal dialysis (PD) is associated with clinical benefits that can set up end stage renal disease (ESRD) patients for future success compared to conventional haemodialysis:

- Patients starting on PD have better short-term survival<sup>1,2</sup>
- Patients treated with PD have better survival compared with those treated with Conventional Hemodialysis using a Central Venous Catheter<sup>3</sup>
- PD better preserves residual renal function<sup>4\*</sup>
- PD is a strong bridge to transplant<sup>5,6</sup>

## PD. Stronger than you think.



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# **Focusing on fall**





Janet Baker Alis

**Alison Thomas** 

As we write this column, the summer feels like it is running away from us—more quickly than many of us would like. Fun in the sun and relaxed schedules will soon be replaced by the usual hustle and bustle of fall, and a regrouping of our priorities and activities, as the new academic year is upon us. Two important CANNT-related events take place in the fall that we would like to remind you of:

Wednesday September 18, 2013, is Nephrology Health Care Professionals Day. This is a day where we celebrate the interprofessional nature of our practice in the specialty of nephrology along with our colleagues, including: clerical staff, dialysis or renal assistants, dietitians, nephrologists, nurses, pharmacists, social workers, technologists and technologist assistants, physiotherapists, chiropodists, and more. Our ability to work together, as a team, to provide quality outcomes is what makes nephrology an area that is unique. We should celebrate! Take this opportunity to celebrate your unit successes with those who contribute to the successes-go to the CANNT website to print a poster for your unit and let us know how your team celebrates. Consider sending along some photos and stories for the next issue of the *CANNT Journal*.

October 6–8, 2013, we come together to network and learn together at our Annual Symposium—**CANNT 2013 in St. John's, NL**. While many of you will be able to join us—for those who cannot, the abstracts for the sessions have been printed in the previous issue of the *CANNT Journal*. Feel free to contact any of the authors of the abstracts if you are not able to attend the session, but are intrigued by the topic and would like to hear more about their work.

Did you notice our new column, "The 5th Modality: Psychonephrology" in the last issue of the journal? Our experts, Drs. Hercz and Novak are responding to the challenging patient and staff scenarios submitted for discussion. We hope that this forum will prove useful and informative, as you navigate your day-to-day practice. Please participate by sending any stories or dilemmas that you may have to share with our experts—they are anxious to assist!

Finally, in this issue we highlight the renewal of a Renal Nursing Professional Practice Model in an article by Harwood, Downing and Ridley of London, ON, and offer up an approach to Neurological Assessment for Nephrology Nurses in an article by McCallum, also of London, ON. And our CE article is on the topic of Pain Management in Hemodialysis Patients.

As you re-focus on fall activities and routines, we hope you enjoy this issue, and look forward to any feedback you may have.

## PLEASE SEND ALL SUBMISSIONS, QUESTIONS OR COMMENTS TO:

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

> Janet Baker: jbaker@haltonhealthcare.on.ca Alison Thomas: athomas6@cogeco.ca

# L'automne est à nos portes



#### Janet Baker

#### **Alison Thomas**

Alors que nous écrivons cette chronique, il semble que l'été tire à sa fin, et ce, encore plus tôt que plusieurs d'entre nous ne l'auraient souhaité. Les petits plaisirs sous le soleil et l'horaire allégé céderont bientôt leur place au tourbillon habituel de l'automne et à l'organisation de nos priorités et de nos activités en ce nouveau début d'année scolaire qui arrive. Nous aimerions vous rappeler la tenue de deux événements importants reliés à l'ACITN cet automne :

Le mercredi 18 septembre 2013 aura lieu la Journée des professionnels de la santé en néphrolo**gie**. À cette occasion, nous soulignons le caractère interprofessionnel de notre pratique en néphrologie avec nos collègues comprenant le personnel de bureau, les assistants en dialyse, les diététistes, les néphrologues, les infirmières, les pharmaciens, les travailleurs sociaux, les technologues et leurs assistants, les physiothérapeutes, les podologues et autres. Notre aptitude à travailler ensemble comme une équipe pour offrir des résultats de qualité fait de la néphrologie un domaine unique. Nous avons raison de célébrer! Saisissez cette occasion pour souligner les succès de votre unité avec ceux qui y contribuent. Rendezvous sur le site Web de l'ACITN pour imprimer une affiche pour votre unité et dites-nous comment votre équipe célèbre cette journée. Vous pouvez aussi nous envoyer des photos et des textes pour notre prochain numéro du Journal de l'ACITN.

Du 6 au 8 octobre 2013, nous nous réunirons pour réseauter et faire des apprentissages en groupe à notre Congrès annuelde l'ACITN de 2013, à St. John's, à Terre Neuve et Labrador.Plusieurs d'entre vous seront de la partie, mais pour ceux et celles qui ne le pourraient pas,des résumés des exposés ont été publiés dans le Journal de l'ACITN. N'hésitez pas à communiquer avec n'importe lequel des auteurs des résumés des exposés si vous ne pouvez participer à la séance, mais que vous désirez en apprendre davantage sur le sujet et sur leur travail.

Avez-vous remarqué notre nouvelle chronique intitulée Le 5<sup>e</sup> élément : la psychonéphrologie (*The 5th Modality: Psychonephrology*) dans notre dernier numéro du journal? Nos experts, Drs Hercz et Novak, répondent aux situations difficiles du personnel et de leurs patients soumises pour discussion. Nous espérons que ce forum s'avérera utile et instructif dans votre pratique au quotidien. N'hésitez pas à nous faire parvenir vos récits ou vos dilemmesà partager avec nos experts qui ont hâte d'apporter leur aide!

Enfin, ce numéro fait état dela révision d'un modèle professionnel de pratique des soins infirmiers dans le domaine de la néphrologie dans un article signé par Harwood, Downing et Ridley de London, en Ontario. Dans un autre article, McCallum (aussi de London, Ontario) présente une approche de l'évaluation neurologique pour les infirmières en néphrologie. Notre article de formation continue porte sur le sujet de la gestion de la douleur chez les patients hémodialysés.

En cette période axée sur les activités et la routine de l'automne, nous espérons que ce numéro saura vous intéresser, et vous invitons à nous faire part de tout commentaire que vous pourriez avoir.

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# Projects, board positions, and awards and bursaries



Welcome to the second edition of the CANNT on-line journal. Thank you for taking the time to view my *Message from the President*. Here is an update on a couple

of the projects that are in progress on behalf of our members:

- The revisions to the Nursing Standards are well underway. We had a great response to our expression of interest for members of CANNT to be involved with this project, as part of the working group or as an expert content reviewer. We hope to have all the work completed by the end of the year and the revised standards will be posted to the website in the New Year.
- Our dedicated Not-For-Profit (NFP) team continues to work diligently on our behalf. The association must be in compliance with the government's new Not-for-Profit Act by October 2014. The new Not-for-Profit Act required documents are almost ready to be distributed to the membership for review and will be discussed during the Annual General Meeting in October 2013.

On behalf of the Board of Directors I would like to thank those members who submitted their names for nomination for board positions. We had a lot of interest in the board positions this year and we are grateful so many were interested in becoming involved. The voting has been completed and we thank all those members who took the time and consideration to vote for their in-coming Board of Directors. I am happy to announce the successful candidates: President-elect Anne Moulton; Website/treasurer Melanie Wiggins; VP Atlantic Karen MacDonald; and VP Quebec Nancy Filteau.

We also had a large number of applications for the annual awards and bursaries. They will be presented during our Annual General Meeting on October 7, 2013, in Newfoundland. We will also present the Excellence in Practice awards to the recipients in Administration/Leadership, Clinical Practice, Education, and the Novice Nurse.

The awards and bursaries, and the excellence in practice awards are just a couple of benefits that come from being a CANNT member. Membership also provides the opportunity and ability to network with colleagues from across Canada and beyond through conferences (to which CANNT members receive a discount), through the website, and from being involved with the refined clinical practice groups.

Please let the office know if you are interested in any of the opportunities offered through CANNT. Together we can make a difference in providing leadership and promoting the best nephrology care and practice through education, research and communication... encourage others to join today at **www.cannt.ca** or call toll free at 1-877-720-2819.

# Projets, posts au sien du CA, et les bourses et les prix annuels



Bienvenue au 2<sup>e</sup> numéro électronique du *Journal de l'ACITN*. J'aimerais tout d'abord vous remercier de prendre le temps de lire le *Mot de la Présidente*.

Voici une mise à jour de quelques projets de nos membres qui sont en cours :

- La révision des Normes de pratique infirmière va bon train. Les membres de l'ACITN ont répondu en grand nombre à notre demande et se sont impliqués dans ce projet à titre de membre de l'équipe de travail ou d'expert pour réviser le contenu. Nous espérons avoir terminé tout le travail d'ici la fin de l'année. Les normes révisées seront affichées sur le site Web au cours de la nouvelle année.
- Notre équipe dévouée du comité pour la conformité à la Loi sur les organisations sans but lucratif (LOSBL) continue de travailler sans relâche pour nous. L'Association doit se soumettre à cette nouvelle loi gouvernementale d'ici octobre 2014. Les documents requis par cette loi seront bientôt prêts à être distribués aux membres pour révision et feront l'objet d'une discussion au cours de l'Assemblée générale annuelle en octobre 2013.

Au nom du Conseil d'administration (CA), j'aimerais remercier les membres qui ont soumis leur candidature pour occuper un poste au sein du CA. Plusieurs ont démontré de l'intérêt pour les postes au CA cette année et nous nous réjouissons qu'autant de membres désirent en faire partie. Le vote est terminé et nous remercions tous les membres qui ont pris le temps et la peine de voter pour élire les membres de leur prochain CA. C'est avec plaisir que je vous annonce les noms des candidates élues : Anne Moulton, présidente élue; Melanie Wiggins, coordonnatrice du site Web/trésorière; Karen MacDonald, v.-p. de l'Atlantique et Nancy Filteau, v.-p. du Québec.

Nous avons aussi reçu un grand nombre de candidatures pour les bourses et les prix annuels. Les gagnants seront présentés au Congrès annuel le 7 octobre 2013 à Terre-Neuve. Nous remettrons aussi les prix d'excellence dans la pratique aux gagnants dans les catégories suivantes : administration/leadership, pratique clinique, éducation et infirmière recrue.

Les prix, les bourses et les prix d'excellence dans la pratique ne sont que quelques-uns des avantages offerts aux membres de l'ACITN. Les membres ont aussi l'occasion et la possibilité de réseauter entre collègues provenant de partout au Canada et au-delà en participant à des conférences (pour lesquelles les membres ont droit à un tarif préférentiel), en naviguant sur le site Web et en prenant part à des groupes sélects de travail sur la pratique clinique.

Veuillez communiquer avec le bureau si certaines des occasions offertes par l'ACITN vous intéressent. Ensemble, nous pouvons faire une différence en apportant notre leadership et en faisant la promotion des meilleurs soins et pratiques en néphrologie par le biais de l'éducation, de la recherche et de la communication. Encouragez les autres à se joindre à l'Association dès aujourd'hui en visitant le **www.cannt.ca** ou en appelant sans frais au 1-877-720-2819.

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# A call for best practice guidelines in nephrology nursing

Dear Editors,

I am writing to vent my frustration to my colleagues about how hard it is to find nursing guidelines for anything on the topic of nephrology! I have spent my last few days trying to find evidence-based guidelines on the care of the renal patient post-angiography. It has been a very frustrating experience. The only resources I have been able to find have been a small paragraph in a textbook for radiologists, a sparse few articles on care post-coronary angiography, and some personal experiences shared by other nurse educators from across Canada.

As nurses, not only do we need to become more actively involved in publishing our experiences, but we also need to advocate for more research supporting best practices in nephrology nursing. For example, there is precious little published in the literature regarding cannulation of the vascular access, the safety versus benefit of some of our routine procedures (e.g., suspending treatment for patient to go to the washroom), or care for nephrology patients pre and post interventional procedures.

I would like to challenge you, my colleagues, to join me in a focused effort to engage in, or participate in research or quality assurance projects in nephrology nursing. If we all engage in this effort, it will lead to the development of evidence-based guidelines and policies that will guide our practice. And we need to start by doing the research and quality improvement projects!

The race is on—and happy researching!

Jennifer Larson, RN, BSN, CNeph(C) Clinical Nurse Educator Renal Services, St. Paul's Hospital Saskatoon, SK (306) 655-5463 **jennifer.larson@saskatoonhealthregion.ca** 

# Attending the ANNA 44th Annual National Symposium—An update

Roberta Prettie, RN, CNeph(C), CANNT President-Elect

As president-elect of CANNT, it was my privilege to attend the American Nephrology Nurses Association (ANNA) National Symposium in Las Vegas, Nevada, on April 21–24, 2013. It was truly an international gathering with delegates from across the United States, Canada, Europe and other points on the globe. Of the 1,102 delegates present, 55 were from Canada. Despite having a variety of health care systems, we all have the same goals to provide the best care to our clientele.

ANNA encourages certification for all nephrology professionals, as does CANNT. To help facilitate certification, the NNCC exams were offered prior to the start of the symposium. Certification is available for all levels of care providers including clinical hemodialysis technicians, licensed practical or vocational nurses, registered nurses and nurse practitioners. Currently in Canada only registered nurses may become certified.

The format of the symposium is very similar to ours. Pre-conference workshops are offered; concurrent sessions are provided for hemodialysis, peritoneal and transplant streams; an exhibit hall showcases vendor displays and poster presentations; and keynote speakers are scheduled daily to motivate attendees.

Sessions are all digitally recorded in order for ANNA members to have access to them following their return home from the symposium. This is facilitated through the ANNA library. Members can listen to sessions they attended in order to review the material, or listen to sessions they had hoped to attend but were unable to. This enables the membership to obtain more CEUs than is possible within the time constraints of the symposium. Glenda Payne, ANNA President 2012–2013, set the membership "on fire" at the Nephrology Nurse Recognition Dinner, as she presented the organization's strategic plan, the tagline being: "ANNA: Learning, leading, connecting, and playing at the intersection of nephrology & nursing." Awards presented followed the same theme of education, leadership and ANNA contributions.

As the symposium drew to a close, the 2013–2014 Board of Directors was introduced. We look forward to welcoming Sharon Longton, ANNA President-Elect, as we gather in St. John's, Newfoundland, for CANNT 2013 from October 6–8, 2013, where we will have the opportunity to learn, lead, connect and play. I hope that you can join us there!

# **NOTICE BOARD**

- Ottawa Supper Clubs—contact Janet Graham, Nephrology Unit, Ottawa Hospital, jgraham@ottawahospital.on.ca
- September 3–November 6, 2013. Application for Canadian Nurses Association spring certification exam. Email: certification@cna-aiic.ca. Website: www.cna-aicc.ca. Toll free phone number: 1-800-361-8404
- September 18, 2013. Nephrology Health Care Professionals Day
- October 6–8, 2013. CANNT 46th National Symposium. St John's, Newfoundland and Labrador. Website: www.cannt.ca
- October 24–25, 2013. BC Kidney Days.
   www.bckidneydays.ca
- April 13–16, 2014. 45th American Nephrology Nurses Association Symposium, Anaheim, California. www.annanurse.org
- April 5, 2014. Exam date for CNeph(C) certification exam. Contact Canadian Nurses Association Certification program. Email: certification@cnaaiic.ca. Website: www.cna-aicc.ca.
   Toll free phone number: 1-800-361-8404



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# RALLY ON THE ROCK

St. John's \* Newfoundland & Labrador "New Found" Realities in Nephrology Nursing and Technology OCTOBER 6-8 - 2013

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## RALLY ON THE ROCK AT CANNT 2013! October 6–8, 2013 • St. John's, NL

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# A renal nursing professional practice model: The next generation

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## ABSTRACT

Professional practice models provide a structure for excellence in nursing practice. Our centre has had a long tradition of working with a professional practice model with proven nursing outcomes such as job satisfaction, empowerment and perceptions of improved patient care. Our model, in place since 1999, has provided an opportunity to discuss and articulate a vision for nursing practice based on the values of accountability, evidence-informed care and empowerment. In order for the model to effectively guide nursing practice, a revision was necessary to keep pace with the changes in the renal program and the health care environment. The revised model needed to address the enhancements in nursing roles, practice environment, corporate requirements and patient care needs. This paper describes a revised professional practice model unique to nephrology nursing.

Our centre has had a long tradition in working with a Professional Practice Model (PPM). In 1997, nursing leaders in the renal program determined that developing a nursing professional practice model for the program was a priority. The result was a comprehensive and unique model for nephrology nursing practice. The process to develop our original Renal Nursing Professional Practice Model (RNPPM) was extensive and has been previously described (Lawrence-Murphy et al., 2000; Harwood et al., 2003). In 1999, after a thorough development and communication

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plan, the RNPPM was implemented on our sites. A few years after the model was implemented, the leadership team recognized the inherent challenge of "maintaining the model" (Harwood et al., 2003). Practice environments change and our centre was no different in this regard. As other issues became strategic and priorities shifted, our model was in need of a revision. This paper describes our new RNPPM, which, to our knowledge, remains the only reported Canadian professional practice model specific to renal nursing.

## BENEFITS OF PROFESSIONAL PRACTICE MODELS

Professional Practice Models are valuable in promoting excellence in nursing practice. Many different definitions of professional practice models exist. One definition commonly reported in the literature is by Hoffart and Woods (1996) who defined PPMs as systems containing structure, process and values that support practice within the nursing care delivery model. A PPM contains five subsystems: values, professional relationships, a patient care delivery model, a management approach, and compensation and rewards mechanisms. The following definition was used by our steering committee to guide the development and revision of the RNPPM: A PPM is a framework to achieve clinical outcomes and reflects integrated beliefs, values, philosophy, knowledge and vision, which guides nurses in their practice (Wong, 1997).

Many other health care organizations value the contribution that a PPM can make to nursing practice and have recently reported the content of their models (Berger, Conway & Beaton, 2012; Erickson & Ditomassi, 2011; Mensik, Scott, Martin, & Horton, 2011; Miles & Vallish, 2010; Westgarth, Chiarella, & Tranter, 2012). One of these models was an Australian model specific to hemodialysis (Westgarth et al., 2012). The Haemodialysis Models of Care (HMoC) was developed and implemented to assist nurses to change the way they organize and deliver nursing care with the goals of empowering nurses to independently improve their work environment and improve their use of resources to enhance the delivery of care. This program involved four training sessions: identifying the problem, planning for change, achieving change, and getting recognized. Nurses who attended the education sessions developed leadership, project management, analytical, and networking skills, which resulted in improved patient care, more organized care and satisfied patients and staff (Westgarth et al., 2012).

PPMs are generally considered more popular outside Canada, particularly in the United States where having a PPM is a key element in establishing Magnet<sup>®</sup> designation recognition (Berger et al., 2012) by the American Nurses Credentialing Centre (ANCC). Magnet designation recognizes health care organizations for quality patient care, nursing excellence and innovations in professional nursing practice. Benefits of this recognition include the ability to attract and retain top talent, improve patient care, foster a collaborative culture and advance nursing standards and practice (ANCC, 2013). An evaluation of our RNPPM, described below, demonstrated a favourable effect on nursing job satisfaction, the practice environment, perceptions of empowerment and patient outcomes (Harwood et al., 2007a; Harwood, et al., 2007b).

## **IMPACT OF THE RNPPM**

Evaluation of the original RNPPM demonstrated a positive impact on nursing practice. A qualitative study with the purpose of examining the effect of our RNPPM on nurses' perceptions of empowerment, characteristics of practice environment and impact on nursing care outcomes was conducted with 10 nurses. The interviews were audio recorded, transcribed verbatim and analyzed using content analysis to identify common themes representing the nurses' experiences. Nurses reported patient benefits and increased job satisfaction post-RNPPM implementation (Harwood et al., 2007a). Common themes expressed by the nurses included increased familiarity with their primary patients and knowing the larger/more global plan of care. The nurses believed patient outcomes were improved due to consistency and continuity of care, as well as nurses taking the initiative, for example, identifying a problem and taking the steps to resolve the issue, consulting team members, presenting at rounds and ensuring the issue was adequately addressed. The role clarity emphasized in the model enhanced the awareness and expectations of being a primary nurse and professional development, which increased job satisfaction, autonomy, empowerment and confidence in the care they provided.

A quantitative study was also conducted on nurses' perceptions of empowerment and characteristics of the practice environments. Thirty-one nurses completed two instruments, Nursing Worklife Index-Practice Environment Scale and Conditions of Work Effectiveness II Questionnaire. When autonomy, control over the practice environment, work relationships and empowerment were examined using a "then and now" approach there was a significant improvement in areas such as: care being based on a nursing (as opposed to medical) model, a preceptorship program, working with clinically competent nurses, patient assignments that fostered continuity of care and organizational relationships of collaboration and consultation (Harwood et al., 2007b). Nursing leadership having knowledge of the historical success and positive impact of the RNPPM, and noting the current gaps in the program agreed it was a priority to revise and revive the model.

#### THE NEED FOR REVISION—GAPS IN PRACTICE

The RNPPM steering committee and nursing leadership supported the revision and revival of the model as a means to provide a theoretical base for renal nursing practice, a care delivery method that promotes accountability, patient continuity and nurse job satisfaction, role clarification and a system that promotes quality improvement for patient care. Many changes in human, technological, environmental and fiscal resources had occurred since the creation of the original model, as health care organizations are inherently composed of change and shifting priorities. Senior nursing leadership at the hospital mandated implementation of a nursing model that differed significantly from our RNPPM. Following this mandate, the in-centre hemodialysis units put our RNPPM and primary nursing on hold and began working on the implementation of this new hospital-wide model, which did not include primary nursing as the care delivery model. Changes subsequently occurred with senior leadership and this hospital-wide model was abandoned. Unfortunately, during this process, our RNPPM and primary nursing were not maintained in some areas and this was a large factor that contributed to the need for the revision of the model. It was evident to the renal nursing leadership team and nursing staff that without primary nursing there were problems with accountability and the quality of nursing care was impacted. For units that did not stop primary nursing this provided a good opportunity to review and revise the RNPPM and renew interest in the model.

Our program in 2013 is larger and is located on different sites than when the 1999 model was developed. For example, the regional program has expanded with more community satellite units. At the time of the original RNPPM in 1999 there were seven satellites while currently there are nine. The home dialysis programs, CKD programs and one satellite unit all amalgamated into one newly constructed site in a community commercial centre. There has also been a substantial turnover in the clinical staff, direct leadership and senior leaders within the hospital. Communication systems have changed since the model was developed with more reliance on technology. For example, in 1999 with the original RNPPM we communicated practice changes differently, as nurses didn't have email within the hospital and we did not have a renal website, which is now the main source whereby protocols and policies are referenced. The technology has also changed with the hemodialysis machines becoming increasingly more advanced than in 1999.

The nursing leaders also noticed a gap in communication. The committee that was originally formed in 1999, post implementation of the model for the purpose of communication and advancing practice, across the entire renal program no longer met. This created a gap risking specific units functioning in silos with duplication. The formation of unit-based CQI councils, while being very successful as a structure for shared leadership, has the potential to amplify duplication and working in silos rather than a renal program-wide approach. The steering committee recommended that a program-wide committee for nursing practice issues be reinstated. There is currently a corporate movement toward outcome-based safety and continuous quality improvement such as falls assessments and allergy assessments. It was difficult to know who was accountable for the assessments and the subsequent plan of care without primary nursing. At the time of the original PPM version the nurse practitioner (NP) role was new to the program. Now the NP role is well established in the program, but new roles such as registered practical nurses (RPN) and nurse case managers (NCM) have been implemented. Individuals in the renal program had not had recent experience with RPNs and clarity was required regarding the role.

In order for the RNPPM to be relevant and viable in today's practice environment the steering committee focused the revised content on:

- New nursing roles (RPN) using Benner's (1984) domains of nursing practice
- Opportunities to increase nursing effectiveness by reducing non-nursing work. Discussions occurred regarding what was nursing work. No work could be deleted and the addition of priming the dialysis machines was added to the nursing workload due to changes in equipment
- Accountability based model of care delivery with primary nursing. Articulation of specific roles and accountability for the initial three hemodialysis treatments, episodes of care and primary nurse role over the continuum of care. This was developed to ensure every new hemodialysis patient received the same education and care. The goal is to assign the primary nurse for the first three sessions
- Consistency of care and nurse-to-patient assignment ratios for the first three hemodialysis treatments across the program was implemented
- The content for hemodialysis patients' orientation and education was agreed upon for the three hemodialysis units in the renal program that start new patients

- Communication and documentation—we determined the method of communication for practice changes and the program structure for meetings to take place
- Nursing leadership
- Integration of our health centre's corporate emerging vision, which includes improved patient family experience, emphasis on informed nursing practice, excellence in patient care, service and safety, quality councils, collaborative partnerships, high-performance teams, empowerment and accountability.

Various resources reflecting current practice were incorporated into the revision of the model such as the *CANNT Nephrology Nursing Standards and Practice Recommendations* (CANNT, 2008), Registered Nurses Association of Ontario (RNAO) Clinical Practice Guidelines and Canadian Nurses Association policy statements.

## **OVERVIEW OF THE REVISED RNPPM**

The RNPPM is based on the Beckwith Institute's transformational model for professional practice in health care organizations (Beckwith Institute, 2013; Wolf, 2000; Wolf, Hayden, & Bradle, 2004). Their transformational model of professional practice contains four elements: 1. The Professional Practice Component, which includes a) transformational leadership, b) care delivery system, c) professional growth, and d) collaborative practice; 2. The Process Component, 3) The Primary Outcome Component, and 4) The Strategic Outcome Component (Wolf et al., 2004).

The RNPPM, illustrated in Figure 1 below, contains four components. The first component, the Professional Practice Component, consists of: a) care delivery system, b) communication system, c) professional development d) collaborative practice, and e) leadership. The remaining components of the RNPPM are Characteristics of Professional Practice, The Process Component, and The Outcome Component.



Figure 1: The renal nursing professional practice model

## 1. The Professional Practice Component (see Figure 2)

This is the largest component of the model, with the patient/family forming the core. There are five sub-categories: care delivery systems, communication systems, professional development, collaborative practice and leadership.

Care delivery systems. In this section, the values and beliefs that formed the foundation to our care delivery systems were reviewed. An accountability-based model of care using primary nursing was believed to be relevant, as was the care delivery system, which most reflected the values and beliefs of the nursing care we wanted to deliver. The accountabilities of nursing staff were articulated (see Table 1) and summarized as follows:

- identification and documentation of mutual goals with patient/family
- monthly follow-up review of blood work to identify trends, gaps, education and changes to the plan of care
- initiating family contact, if appropriate
- ensuring that documentation is up to date
- accountability for corporate quality initiatives, e.g. medication reconciliation and allergy documentation
- initiating appropriate referrals on behalf of the patient
- · creating, updating, implementing and evaluating the teaching plan with patient/family
- · identifying, intervening, updating, referring, and follow-up re: psychosocial issues
- · identifying overall trends and follow-up for issues and outcomes in patient's care
- · developing, monitoring and evaluating guidelines for primary nurse assignment
- monitoring outcomes of nursing practice
- · engaging in evidence-informed decision-making, for example, is the patient receiving adequate dialysis with a permanent access?
- collaborating with and supporting the patient, nephrologists and the entire interdisciplinary renal care team in treatment planning
- facilitating patient-specific interdisciplinary practice plans

Continuity and integration across the continuum of care were themes woven into the care delivery model. The RPN role had been recently implemented in two of the units within the renal program and role clarity was needed. Matching patient needs with caregiver competencies was clarified and consensus was achieved regarding who and how decisions for patient assignments were to be made. A chart was developed articulating the similarities and differences between the RN, NP, and RPN roles using Benner's (1994) domains of practice and practice guidelines from the College of Nurses of Ontario (CNO, 2011). Using evidence-informed decision-making is desired and educational opportunities are offered on a regular basis.



#### **Figure 2: The professional practice component**

Table 1: Excerpt from RNPPM accountability based model of care						
RN Only Accountability of all nurses for new patient hemodialysis starts	RN and RPN Accountability of all nurses at each treatment (episodes of care)	Accountability of the Primary Nurse for assigned patients (across episodes of care)				
1:1 assignment suggested for the first three hemodialysis treatments to allow adequate time to complete patient assessment, planning and documentation	Treatment care encompassing assessment, planning, delivery and evaluation of patient care	Monthly review of patient care provided. Incomplete tasks to be communicated and documentation of instruction given for completion of care				
<ul> <li>Ensure Primary Nurse assigned to patient</li> <li>Provide orientation to unit</li> <li>Confirm treatment schedule and transportation arrangements</li> <li>Complete patient assessment and complete nursing history</li> </ul>	<ul> <li>Review chart for any new or unprocessed orders</li> <li>Process any orders</li> <li>Complete a pre-dialysis assessment of the patient (weight, fluid assessment, including chest sounds, edema, vital signs, general well-being, infection control) and document the results</li> <li>Obtain lab specimens as ordered</li> </ul>	<ul> <li>Develop a therapeutic relationship with patient and/or family</li> <li>Review patient care plan to ensure goals (short term and long term) are current and include modality, transplant and access</li> <li>Review learning needs and teaching plan to ensure they are current</li> <li>Review and ensure health care professionals are aware of reported patient concerns</li> </ul>				

---------. .... . . . . **Communication systems.** There have been many changes in the clinical health records systems and how nurses communicate with each other since the inception of the original model. For example, nurses did not have access to email in 1999. New methods of nurse-to-nurse and nurse-to-team communication were revised in the model. The steering committee members acknowledged that the electronic medical record that is currently being implemented would improve patient communication across our multisite program.

**Professional development.** This section was revised to reflect current definitions, resources and the roles and responsibilities for the individual, the program and organization.

**Collaborative practice.** Collaborative practice was defined with current literature and agreed upon for a shared understanding of the concept.

**Leadership.** A shared governance structure for decision-making regarding the practice of nursing in the program is reflected in unit-specific quality councils, and various committees and task teams. The London Health Sciences Centre Emerging Vision was integrated into this revision of the model and concepts were consistent with the model.

## 2. Characteristics of professional practice

The principles and characteristics of professional practice were reviewed and updated with a shared understanding of what professional nursing practice is in the renal program. These characteristics were developed with the original RNPPM. Discussions occurred with the members on the steering committee for the revisions to the RNPPM and there was consensus that this list reflects what professional practice for renal nursing entails in our organization. Renal nursing exemplifies:

- Individual accountability for assessing, planning, coordinating, implementing and evaluating nursing care for patients and families and evaluating patient/family outcomes
- Autonomy with decision-making within the scope of practice
- Holistic, patient/family-centred practice that supports and integrates planning across the care continuum to maximize chronic disease management
- Advocacy for patients/families to achieve best practice in all aspects of care
- Continuity of care
- Collaborative interprofessional care
- Therapeutic patient/provider relationships
- Evidence-informed decision-making
- Effective use of communication and team skills to promote quality patient/family care
- Commitment to continuous professional development and quality outcomes
- Advancement of individual and collective knowledge and expertise
- Cost-effective use of resources
- Ethical code of conduct

## 3. The process component

The process component represents activities used by nurses to provide care that includes methods and structures for care delivery (Wolf et al., 2004).

The processes for renal nursing professional practice include:

- Primary nursing
- Patient-centred collaborative care
- Goal setting
- Assessment, planning, intervention, evaluation
- Reflective practice
- Empowering work environments
- Shared leadership
- Quality councils
- Program-wide renal nursing professional practice committee.

## 4. The outcome component

The outcome component of the model refers to proposed and actual outcomes as a result of the use for the model in practice. These outcomes can be related to patients, health care teams, the organization, and the individual nurse (Wolf et al., 2004). Previous outcome evaluations of the original 1999 model demonstrated a positive impact on patient benefits, nurse job satisfaction, patient continuity of care, plans of care, empowerment, nurse role clarity, and team relationships. We propose that with the implementation of the revised RNPPM, the previous outcomes will be achieved and proposed outcomes actualized. At this point in time a formal research study evaluating the model is not planned. Many future CQI projects could be conducted to evaluate some aspect of the model such as patient satisfaction. The system already exists for evaluation of the organization's CQI priorities and it is expected that these will improve with the primary nursing. Audits currently occur in the program for several of these CQI outcomes. Program-wide quality indicators based on national guidelines are well established within the program and will continue. It is also recommended that the unit-based CQI councils do three CQI projects a year. Depending on the priorities of the units these may include projects impacted by the RNPPM. We are in the process of moving forward with an electronic health record, which has the potential to improve efficiencies with our current CQI systems. The proposed outcomes of the RNPPM are as follows:

- Patient satisfaction, patient experience and safety\*
- Collaborative goal setting\*—in particular with renal program goals of vascular access and patient independence
- Accountable\* and responsive care such as completed foot assessments and medication reconciliations in accordance with accreditation guidelines
- Cultural transformation\*
- Empowering work environments\*
- High-performing teams\*
- Dynamic work environment supportive of highly professional behaviour\*
- Support systems for professional growth
- · Achievement of corporate quality initiatives
- Continued reputation for quality care
- Ability to influence renal nursing practice
- Demonstration of the renal program to invest in nephrology
- \*also indicates a London Health Sciences Centre vision outcome

#### **FUTURE DIRECTIONS**

The next phase of this project is to launch the revised model and provide staff education regarding the changes. Each area within the program will form unit-specific task teams with the mandate to implement the model. We will undoubtedly identify slight practice nuances that will be discussed and resolved in order for the model to be used to its full potential. One of the limitations of this model is that it is most applicable to the largest component of nurses in the program, which is the hemodialysis nurse. Other areas in the renal program, such as peritoneal dialysis are still required to follow the model and are encouraged to adapt the documents that will assist them in following the model.

We have learned from previous experience that maintaining the RNPPM is a challenge (Harwood et al., 2003). Systems will need to be put in place for maintenance of the model. At the individual level, the RNPPM is part of the orientation program for new nurses to the renal program. At the systems level, the tasks teams will work at developing tools to assist nurses, for example, a checklist to cue the primary nurse for the required monthly patient assessments. It will also be the mandate of the program-wide renal nursing professional practice committee to review the RNPPM on a regular basis and determine when a revision is needed. The content of the model should be reviewed every two years and as necessary. It was also evident from the

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steering committee meeting that there was no forum for nurses from the various units to discuss common issues. This committee will be very helpful in promoting collaboration, reducing duplication, and curtailing the risk of working "in silos".

## CONCLUSION

This paper described the revision to a PPM specific to nephrology nursing practice, which has demonstrated an impact on nurse job satisfaction, increased perceptions of empowerment and improved nursing care outcomes. It is an example of how frameworks/models need to be continually maintained ("maintenance of the model") to be cohesive with current patient care, roles, technology and organizational vision.

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# The connection between neurosciences and dialysis: A quick neurological assessment for hemodialysis nurses

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## ABSTRACT

Stroke is a significant medical emergency and occurs frequently in patients receiving renal replacement therapy. In 2005, the Registered Nurses Association of Ontario (RNAO) published Nursing Best Practice Guidelines for Stroke, highlighting the necessity and expectation that all nurses, regardless of specialty, are able to perform an abbreviated neurological assessment, identify the symptoms of stroke, and respond to these as a medical emergency. This article highlights the significance of neurovascular disease in persons who receive renal replacement therapy, and serves as an educational review for dialysis nurses to increase their neurological functional assessment skills. The outlined abbreviated neurological assessment parallels the Canadian Neurological Scale, and is based on the practice recommendations published in the RNAO Nursing Best Practice Guidelines in 2005.

**Key words:** stroke, renal replacement therapy, best practice guidelines

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## LEARNING OBJECTIVES

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

- Identify the risk factors for, and signs and symptoms of stroke in patients with end stage renal disease on renal replacement therapy.
- Discuss the role of the nurse in the management of stroke according to best practice guidelines.
- Describe the abbreviated neurological assessment that can be carried out by the nephrology nurse in a patient on dialysis.

## BACKGROUND

As kidney function declines, the rate of vascular events increases (Parfrey & Foley, 1999). Therefore, persons with end stage renal disease receiving renal replacement therapy are at an elevated risk for stroke (Koren-Morag et al., 2006). Based on data from the United States Renal Data Systems (USRDS), the incidence of stroke in end stage renal disease is 33 per 1,000 patient years (Seliger et al., 2003). Stroke is the third highest cause of death of persons receiving hemodialysis treatment (Jungers et al., 1999; Shah, Chow, & Mattanan, 2000); whereas it is only the fourth leading cause of death amongst the general population in Canada (Department of Health Policy, Management and Evaluation, 2005). Traditionally, we view stroke as being a very dramatic event that occurs suddenly. However, 55.6% to 57% of chronic hemodialysis patients develop microvascular occlusions resulting in silent cerebral infarction, as seen on Magnetic Resonance Imaging (MRI) (Fukunishi et al., 2003; Geissler et al., 1995). A silent cerebral infarct is a stroke without obviously noticeable symptoms. Almost 50% of hemodialysis patients die of a sudden arterial occlusion; elevating stroke, including cerebral arterial occlusions, to the third highest cause of death in the hemodialysis population (Jungers et al., 1999; Shah et al., 2000). Naganuma et al. (2011) conducted a prevalence study comparing hemodialysis patients to healthy control subjects and found

significantly more cerebral microbleeds and cerebral microinfarcts. This increased incidence amongst hemodialysis patients is not explained by the traditional risk factors for stroke (Kurella et al., 2005). In fact, despite having fewer traditional stroke risk factors, peritoneal dialysis patients are more likely to die from a stroke than hemodialysis patients (Mattana, Effiong, Gooneratne, & Singhal, 1997).

# STROKE: COMPARING THE GENERAL POPULATION TO END STAGE RENAL DISEASE

Stroke is a general term related to an impairment of cerebral circulation; this is related to either hemorrhagic or ischemic impairment of the arteries in the brain (www. heartandstroke.com). Impairment of cerebral circulation leads to cerebral anoxia and loss of neuronal function. Stroke symptom presentation includes: motor weakness (paresis), trouble speaking (dysphasia), vision problems, headache, and dizziness (www.heartandstroke.com). Traditional risk factors of stroke in the general population include: age, gender, family history, ethnicity, history of stroke or Transient Ischemic Attack (TIA), hypertension, hypercholesterolemia, heart disease or atrial fibrillation, diabetes, overweight, excessive alcohol consumption, physical inactivity, smoking and stress (www.heartandstroke. com). In reviewing data from the USRDS, Seliger et al. (2003) identified high mean blood pressure and malnutrition as two potentially modifiable risk factors amongst people receiving renal replacement therapy. Atherosclerosis in the general population affects the intima layer of the blood vessel. However, in renal replacement therapy, blood vessels are uniquely ossified in both the intima and medial or muscular layers (Jungers et al., 1999). In addition to the Framingham risk factors, vascular calcification in persons receiving renal replacement therapy is also associated with inflammation, disturbances in bone mineralization, hyperphosphatemia, osteoprotegerin, matrix Gla protein, and a deficiency in fetuin-A or alpha-Heremans-Schmid glycoprotein and deficiency in Vitamin K (Wang, 2009). Plasma levels of lipoprotein (a), high-sensitivity C-reactive protein level, interleukin-6, and monocyte chemo-attractant protein-1 are significantly associated with silent cerebral infarction in persons on hemodialysis (Anan et al., 2008; Fukunaga et al., 2008; Kikuchi, et al., 2011; Uchida et al., 2012).

## SILENT INFARCTIONS AND MICROVASCULAR IMPAIRMENT

Blood flows to brain tissue through arteries, arterioles, and capillaries. Where arterial occlusion or hemorrhage causes functional impairment, occlusion of the smaller blood vessels may cause very subtle impairments that may go unnoticed. More than half of hemodialysis patients have evidence of white matter changes on Magnetic Resonance Imaging (MRI) due to microvascular, silent, cerebral infarctions (Fukunishi et al., 2003; Geissler et al., 1995). Infarctions lead to tissue death, then surrounding tissue inflammation, ending in tissue atrophy; this cerebral microvascular-related atrophy adds to the atrophy of normal aging (Fukunishi et al., 2003; Geissler et al., 1995). In fact, the longer that a person has been on hemodialysis treatment, the more prominent the cerebral atrophy on radiographic imaging (Kamata et al., 2000). Although the differential diagnosis list for causes of dementia is very long, one of the categories includes vascular dysfunctions. Cerebral infarctions can cause cognitive impairment resulting in a form of dementia (Knopman, 2007; Murray et al., 2007). Vascular dementia is a pathological alteration of multiple blood vessels resulting in brain tissue death, causing a gradual decline in cognitive function over time (Hachinski & Bowler, 1993). Hachinski et al. (2006) went on to define this disorder as "vascular cognitive impairment". However, vascular cognitive impairment is not measurable by radiographic imaging; rather functional impairment is the focus, and it is measurable by cognitive testing (Knopman, 2007; Murray et al., 2007). Thus, Murray et al. (2007) chose to perform cognitive testing on 338 chronic hemodialysis patients in Minnesota, only to discover more than one third of hemodialysis patients have severe cognitive impairment, and more than one third have moderate cognitive impairment. Interestingly, the prevalence results of the study by Murray et al. (2007) transpose onto the results found by Fukunishi et al. (2003) and Geissler et al. (1995), where greater than 50% of hemodialysis patients have microvascular infarctions visible on MRI. Given the fact that fewer than 15% of chronic hemodialysis patients have normal cognitive function (Murray et al., 2007), we may wish to review our expectations and clinical approach in teaching chronic hemodialysis patients. However, for the purpose of this article, the focus remains the identification of new-onset of stroke and how the nurse performs an initial assessment.

## **INCREASED RISK OF STROKE**

The decline in cognitive functioning of persons requiring hemodialysis as they age is a substantial concern (Pereira, Weiner, Scott, & Sarnak, 2005). As previously stated, there is a long list of potential causes of cognitive dysfunction in the renal replacement therapy population. Some people requiring renal replacement therapy are known to have microvascular disease, which may or may not have caused their kidney dysfunction. Over time, the disease in the microvascular circulation can extend to affect larger blood vessels, known as macrovascular disease (Murray et al., 2007; Knopman, 2007). Thus, researchers such as Murray et al. (2007) and Knopman (2007) suggest that individuals with microvascular-related cognitive impairment are at an increased risk of a large cerebral artery occlusion, resulting in a dramatic stroke with life-altering outcomes.

## RELEVANCE TO NEPHROLOGY NURSING PRACTICE

Nephrology nurses should be aware of the high incidence and prevalence of cognitive impairment and stroke in the chronic renal replacement therapy population. Nurses are the first contact during the frequent, in-centre chronic hemodialysis treatments and are often informed of any changes or new symptoms by the patient or their family member. Since hemodialysis nurses typically have an established therapeutic relationship with chronic hemodialysis patients, and see them several times per week, nurses are in the best position to recognize a patient's cognitive change during their interaction with the patient. The critical thinking skills of registered nurses (RNs) is ideal for assessing, identifying, and prioritizing any new symptoms or signs that a patient may exhibit. The purpose of this article is to highlight the increased risk of stroke in persons who are dependent on renal replacement therapy, to be aware that a stroke is considered a medical emergency, and to outline a brief bedside neurological assessment screening tool for the nephrology nurse.

New onset of stroke is considered a medical emergency (Heart and Stroke Foundation of Ontario & RNAO, 2005). It is expected that all RNs, regardless of specialty, should be able to recognize the signs of stroke and perform a basic neurological screening assessment (Heart and Stroke Foundation of Ontario & RNAO, 2005). An abbreviated neurological assessment by the bedside nurse is intended to quickly identify an abnormality in mental status or unilateral dysfunction (Bickley & Szilagyi, 2009). Anyone identified with a new neurological abnormality should be referred to a health care professional immediately who is able to complete a thorough neurological assessment, which would include a review of the patient's mental status, speech, motor function, sensory function, cranial nerves and deep tendon reflexes (Adams et al., 2007; Bickley & Szilagyi, 2009). Overall, the concept "time is brain" is applied to stroke, and "STAT" medical management during the first few hours of onset of symptoms can substantially improve health outcomes (Adams et al., 2007; Heart and Stroke Foundation of Ontario & RNAO, 2005). If a patient describes symptoms of a stroke that resolved within 24 hours, this is labelled as a Transient Ischemic Attack (TIA). Amaurosis fugax is a sudden decline in vision of one or both eyes and is more common in a TIA than a stroke (www. heartandstroke.on.ca). The initial 48 hours after the onset of a TIA is the interval during which there exists the highest risk of a new stroke. Therefore, anyone who describes symptoms of a TIA or stroke should be assessed thoroughly as a medical emergency (Bushnell, Johnston, & Goldstein, 2001; Rothwell et al., 2007).

## ABBREVIATED NEUROLOGICAL ASSESSMENT

Sudden, new onset of cognitive impairment or confusion is complex; one potential cause is stroke. A truly, minimally abbreviated neurological assessment of: "arousal to (painful) stimulus", patent airway, bilaterally equal motor function and pupil function might be sufficient for the bedside nurse in a high-intensity, or an in-patient unit, but it is not sufficient for the patient in dialysis. For patients receiving in-centre renal replacement therapy, most people are awake, breathing, coming from home on the correct day at the correct time, and either walking into the centre, or being wheeled in a wheelchair. Given the increased incidence of stroke in the renal replacement therapy population, it is vital to assess the patient's neurological function to seek a potential focal cause. If there is a sudden impairment of one of the arteries in the brain, then all brain tissue supplied by that artery will demonstrate a decline in function. Thus, when a health care provider does a neurological assessment, the purpose is to seek out the functional deficits to determine if there is a focal area of the brain involved.

An abbreviated neurological assessment by the nurse should include: 1) level of consciousness, 2) orientation, speech and language, 3) motor movement, and 4) pupils (Heart and Stroke Foundation of Ontario & RNAO, 2005). In collecting data during a neurological assessment, vital signs (temperature, heart rate, respirations, blood pressure, and oxygen saturation if applicable) and blood glucose levels should also be included (Heart and Stroke Foundation of Ontario & RNAO, 2005). This is very similar to the Canadian Neurological Scale - Stroke Assessment (CNS) (Côté et al., 1986). Bushnell et al. (2001) compared the CNS to the National Institute of Health Stroke Scale (NIHSS), finding both have exceptional inter-rater reliability, yet the CNS stroke assessment requires less-detailed testing than the NIHSS. Therefore, the Canadian Neurological Scale-Stroke Assessment headings, and the recommended abbreviated testing, as per the RNAO Best Practice Guidelines, are highlighted in this article. Hemodialysis nurses are already performing the majority of the Canadian Neurological Scale in their observations and initial assessment of patients before the start of the hemodialysis treatment. This article describes a hemodialysis nurse's initial assessment, but is organized into a neurological assessment format with just a few additions.

## 1. Level of consciousness

Level of consciousness includes both sensory awareness and an appropriate motor response; in other words, "is the patient awake and alert" (Bickley & Szilagyi, 2009; Tortora & Anagnostakos, 1987). Although obvious, this must be acknowledged as the formal first step. Most patients are awake on arrival to hemodialysis, or at least arouse quickly if they are asleep, and are able to respond to questions. If the patient is not "awake and alert", then the patient may be considered "drowsy" if he/she drifts off to sleep after arousing briefly to a verbal stimulus. If the patient is not conscious, or is not able to arouse and respond, and this is a new or recent finding, then a physician or nurse practitioner should be informed immediately to perform a more detailed neurological assessment.

## 2. Orientation, speech and language

On arrival to dialysis, the nurse greets the patient and is able to assess orientation, thought processing and perceptions during a brief conversation (Bickley & Szilagyi, 2009; Côté, Hachinski, Shurvell, Norris, & Wolfson, 1986; Bushnell et al., 2001). Even patients who do not speak the same language as the nurse know the dialysis routine and are able to demonstrate or express the answers to the most common questions asked prior to initiating treatment. Being "oriented" means having awareness of "place" and "time" (Côté et al., 1986). Sometimes, patients will greet the nurse by name, smile, and initiate a conversation about their day, their travel experience into hemodialysis, a recent news event, or how they felt, including their minutes to recovery after their last hemodialysis treatment. If the initial conversation does not reveal the patient is oriented, asking the patient what city, or what kind of a building they are in is a simplistic way of assessing orientation to place (Bickley & Szilagyi, 2009). When asking the patient about the date, an answer within a week is generally accepted; most individuals know the month and year (Côté et al., 1986). This initial conversation also permits an assessment of the patient's speech, language and facial motor skill. For example, assessing for abnormal speech pattern, slurred speech, or using incorrect words to identify objects should also be noted (Côté et al., 1986). The patient may have an expressive deficit if the patient mixes up the names of objects or has difficulty with expressing themselves. If there is a new onset of a deficit, a physician or nurse practitioner should be informed immediately.



Figure 1: Illustration: Pronator drift

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Fig	ure 2: 12 cran	ial nerve	25	(L+V+1)
Above the midbrain				Cranial Nerve Name
I	Olfactory	Nose	Smell	II- Optic III- Oculomotor
11	Optic	Eye	Eye sight in four quadrants and centrally	V- Trochlear V- Trigeminal VI- Abducens
Abo	ove the pons			VII - Facial VIII - Vestibulocochicar
ш	Oculomotor	Eye	Eye movement in six directions	X - Glossopharyligeal X - Vagus XI - Spinal Accessory
IV	Trochlear	Eye		XII - Hypoglossal
VI	Abducens	Eye		
Mid	pons			
v	Trigeminal	Face	Sensation in six areas and movement	
Alo	ng the medulla	3	In four areas	
VII	Facial	Face		
VIII	Acoustic	Ear	Hearing	
IX	Glossal- pharyngeal	Mouth	Tongue movement, gag and swallow	
х	Vagus	Mouth		
XII	Hypoglossal	Mouth		
XI	Spinal Accessory	Neck	Shrug shoulders or move head from side to side against resistance	
Tab	le created by	Charlotte	e McCallum based on information from Bi	

## 3. Motor movement

The initial greeting and conversation is often accompanied by a smile, or other facial expression. When the nurse smiles the patient may respond with a spontaneous smile. Observing the patient's bilateral facial movements is one way of assessing facial motor symmetry. While the patient is entering the hemodialysis area, the nurse is observing the patient's gait or symmetry while sitting in the wheelchair, transferring into the dialysis chair, or while weighing themselves on the scales. How the patient manoeuvres their body to measure their weight on the scale may reveal an obvious or new deficit in balance, or in the individual's strength in an arm or a leg.

If there are any abnormalities in the initial observation, the pronator drift test (see Figure 1) is a quick and easy motor and sensory assessment involving multiple areas of brain functioning in both the cerebellum and cerebrum (Pullen, 2004; Bickley & Szilagyi, 2009). This test independently carries a sensitivity of 22% in identifying an early, focal neurological lesion (Anderson et al., 2005). When performed for a full 45 seconds as a test of motor strength, it has very good sensitivity and specificity with a positive predictive value and good external validity (Heart and Stroke Foundation of Ontario & RNAO, 2005; Pullen, 2004). However, if the patient is unable to hold an arm up for three to five seconds, or begins to drift in just 10 seconds, it is considered a motor arm deficit (Côté et al., 1986). Thus, 45 seconds is not required if there is an obvious deficit. Ideally, this test is intended to be assessed with a patient in a standing position. However, this can be done in a sitting position or with the head of the bed elevated (Pullen, 2004; Bickley & Szilagyi, 2009), which is the position many people are already in while dialyzing. The patient is asked to hold their arms up in front of them, like they are holding a serving tray, close their eyes, and hold this position (Pullen, 2004). If there is any drifting of either arm up or down this is abnormal, and requires further investigation (Bickley & Szilagyi, 2009). If the patient is performing well, the nurse may further test the patient's strength by

Figure 3: Common signs of stroke
Common Signs of Stroke
Weakness Trouble speaking Vision problems Headache Dizziness
Common Signs of Transient Ischemic Attack
All of the above and/or: Sudden blindness in one or both eyes or double vision
Adapted from The Heart and Stroke Foundation

applying pressure to the outstretched arms and attempting to push the patient's arms down (Côté et al. 1986). If the patient is being assessed in a standing position before or after dialysis treatment, be prepared to support the patient in the event their sense of balance is disrupted, particularly when their eyes are closed (Pullen, 2004).

Assessment of lower limb movement is far more challenging in dialysis patients, particularly given more than 13% have had some form of an amputation (Locking-Cusolito et al., 2005). Simply observing the patient walk into the hemodialysis unit, weigh on the scale, or transfer into a dialysis chair or bed, provides the nurse with sufficient information required for a quick lower limb motor assessment and balance. Most importantly, any new motor deficit should be further assessed immediately by a nurse practitioner or physician.

#### 4. Vital signs, pupil assessment and cranial nerves

The final step in the assessment is recording vital signs (or statistics), and pupil assessment, which includes two cranial nerves (see Figure 2). According to the Heart and Stroke Foundation of Ontario and Registered Nurses' Association of Ontario (2005) Best Practice Guidelines, all nurses should include an assessment of pupils when carrying out a neurological assessment. A pupil assessment tests both cranial nerves II and III, and reflects involvement of the brainstem structures anticipating a quickly approaching coma (Bickley & Szilagyi, 2009). A pupil assessment requires the use of a flashlight with a small, centrally concentrated light (Bickley & Szilagyi, 2009). However, realistically, in most non-neuroscience specialty areas, a flashlight is a tool that is rarely accessible. Therefore, assessment of pupil reaction to light may not be possible. Ideally, the size of the pupil in each eye is measured and compared for equal size and shape prior to shining the flashlight. When the flashlight is quickly passed over one pupil, a brisk constriction should be visible not only in the eye being assessed, but there should be a simultaneous, congruent reaction in the opposite eye.

In a less-than-ideal situation, the two cranial nerves being assessed with pupil reaction to light can be assessed separately. However, this would not be expected of a dialysis nurse at the bedside. Pupil constriction to light involves cranial nerve II, which senses light, and cranial nerve III, which stimulates the motor response to constriction of the diameter of the pupil. Assessment of these nerves can be done separately, if required, and is ideally done with the examiner positioned facing the patient. The optic nerve is the second cranial nerve, and stems from just above the midbrain. It is responsible for sight in four quadrants and centrally in both eyes. Assessing all four visual quadrants of each eye is quickly done by having the patient cover one eye with the assessor holding up one or two fingers. Patients are then asked to state how many fingers they see. This exercise can determine if the patient has vision in each of the fields. Patients experiencing a TIA may display double vision, or a lack of vision in one or both eyes (www.heartandstroke.on.ca). Central vision deficit is quickly screened by having a patient read words or identify symbols on a page, such as reading the numbers on the dialysis weigh scale. Cranial nerve III is the oculomotor nerve; it is located in the midbrain, above the pons. It is typically assessed in combination with cranial nerves IV (trochlear) and VI (abducens). In combination, these cranial nerves can move the eyes in six directions; all of these positions can be achieved by having a patient follow your finger while drawing a large upper case "H" figure, or following the recommended: up, down, side to side and each diagonal position in between (Bickley & Szilagyi, 2009; Talley & O'Connor, 2006).

## IMPLICATIONS FOR NURSING PRACTICE AND RESEARCH

Neurological assessment is not part of most dialysis nurse's orientation program, nor is it necessarily taught in a nurses' basic education. Unbeknownst to most nurses, the abbreviated neurological assessment is recommended as a required skill of all nurses regardless of their specialty. Nephrology nurses must be able to identify symptoms of stroke, which is a common vascular event for dialysis patients. A 40-year-old man requiring chronic hemodialysis treatment is as likely to have a sudden vascular event as an 80-year-old man in the general population (Block, Raggi, Bellasi, Koolenga, & Spiegel, 2007). Despite being aware of the increased incidence of vascular calcification in patients receiving chronic hemodialysis treatment (Goodman et al., 2000; Keattiyoat et al., 2007), little nephrology-specific research has been published on cognitive functioning, and cerebral microvascular imaging changes in patients receiving chronic dialysis. Stroke is a cognitively debilitating disease. Given that stroke is the third highest cause of death in patients receiving chronic hemodialysis treatment, the questions are raised: "Are patients and hemodialysis nurses aware of this statistic?", and "Would the knowledge of this statistic alter a patient's lifestyle choices to promote renal preservation, or alter an individual's choice of renal replacement therapy when it's needed?" Additional quantitative and qualitative research studies are needed to explore the

## health and outcomes of patients receiving chronic renal replacement treatment. It is reasonable for all nurses, especially hemodialysis nurses, to update their skills to include an abbreviated neurological assessment and raise their awareness of the significance of stroke in patients receiving chronic hemodialysis.

impact of this substantial cognitive dysfunction on the

## CONCLUSION

It is without argument that patients receiving dialysis must be viewed as being at a high risk for vascular events. If patients do not begin dialysis with vascular problems, they will likely develop vascular pathology over time on renal replacement therapy. The specific cause of the very unique alteration in the medial layer of blood vessels that occurs in patients receiving dialysis remains unknown to this date. Several researchers have published on various inflammatory markers, as there is a suspicion that a stress response, including inflammation, may be one of the causes. While exploring the dramatic and shocking statistics of neurovascular disease and cognitive dysfunction in patients requiring dialysis, it is clear that neurosciences remains a relatively unexplored territory in publications related to the renal replacement population. In view of the fact that only 15% of hemodialysis patients have normal cognitive function (Murray et al., 2007), additional research should include how cognitive function impacts health care provider expectations of a patient's understanding and retention of health education and the degree of their self-management capacity. Although nurses specialized in dialysis might not consider performing neurological assessments as part of their specialty, stroke is, in fact, a potential outcome in persons receiving renal replacement therapy, and it is an expectation that all nurses in all specialties should be able to perform an abbreviated neurological assessment. As a screen to uncover possible cerebrovascular abnormalities, an abbreviated neurological assessment for the purpose of exploring potential symptoms of stroke is easy for the hemodialysis nurse to learn and perform. The fact remains that the findings nurses are already acquiring in their daily assessments of patients can be applied to an abbreviated neurological assessment.

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## CONTINUING EDUCATION STUDY QUESTIONS

**CONTACT HOUR: 2.0 HRS** 

## The connection between neurosciences and dialysis: A quick neurological assessment for hemodialysis nurses

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- What is the third leading cause of death among hemodialysis patients?
   a) myocardial infarction
  - b) stroke
  - c) pulmonary embolism
  - d) motor vehicle collision
- According to the literature, what percentage of patients receiving hemodialysis has radiographic evidence of having had a stroke?
   a) 10%
  - a) 10% b) 30%
  - b) 30%
  - c) 50%
  - d) 70%
- 3. What do the Nursing Best Practice Guidelines for Stroke published by the Heart and Stroke Foundation of Ontario and Registered Nursing Association of Ontario recommend?
  - a) all nurses should be able to perform a detailed neurological assessment
  - b) hemodialysis nurses should be able to perform a detailed neurological assessment
  - c) all nurses should be able to perform an abbreviated neurological assessment
  - hemodialysis nurses should be able to perform an abbreviated neurological assessment
- 4. Cerebral atrophy seen on radiographic imaging is generally more prominent in patients who have end stage renal disease and receive hemodialysis. This observance is associated with which one of the following:
  a) heparin use during
  - hemodialysis
  - b) excessive fluid retention even at the end of hemodialysis treatment
  - c) the length of time a patient has been receiving dialysis treatments
  - d) a person who also has insulincontrolled diabetes mellitus

- 5. What percentage of patients receiving chronic hemodialysis have normal cognitive function?
  - a) less than 15%
  - b) 15-30%
  - c) 30-50%
  - d) more than 50%
- 6. If an individual exhibits symptoms of a Transient Ischemic Attack (TIA), why should this individual be treated as a medical emergency and be thoroughly assessed?
  - a) the highest risk of stroke is 48 hours after a TIA
  - b) a person with a TIA can have an unnoticed stroke
  - c) a person who has a TIA must be assessed for the removal of their driver's licence
  - d) a person with a TIA should be assessed for the need of anticoagulation therapy
- In collecting data during neurological assessment what other information would the nurse expect should be assessed?
  - a) medication list, blood glucose, electrolytes, CK-MM, and oxygen saturation
  - b) electrocardiogram, CBC, electrolytes, CK and Troponin levels
  - c) pain description, visual ability, blood pressure, heart rate, and respiratory rate
  - d) temperature , heart rate, respirations, oxygen saturation and blood glucose
- The remaining questions relate to the following case:

Mr. B. is a 77-year-old man on hemodialysis for two years. He was on peritoneal dialysis for five years prior to that. His past medical history includes: anxiety, hypertension, smoking history of half a pack per day for 50 years, abdominal aortic aneurysm repair, bowel obstruction, pulmonary embolus with a DVT, hypercholesterolemia, and severe COPD. Mr. B. began complaining of feeling lightheaded and dizzy, with severe pain in his right eye, and difficulty reading the left side of the TV screen.

- 8. What action should the nurse at the bedside do after measuring heart rate, blood pressure, respiratory rate and temperature?
  - a) provide a cold cloth and offer analgesics, as prescribed for headaches
  - b) call the doctor for assessment and appropriate treatment of migraine-like symptoms
  - c) perform an abbreviated neurological assessment on the patient
  - d) call the doctor for assessment and appropriate treatment of stroke-like symptoms
- 9. What areas of the brain does the pronator drift test assess?
  - a) the cerebellum and cerebrum
  - b) the optic nerve and the sensory cortex
  - c) the brain stem and mid brain
  - d) the primary and secondary motor cortices
- 10. Mr. B. stated he was unable to read the left side of the television screen. How can the examiner assess Mr. B.'s ability to see on the left side?
  - a) hold up one or two fingers, and ask Mr. B. to count how many fingers he sees
  - b) give Mr. B. a book, and ask him to read out loud from a page
  - c) assess one eye at a time, and hold up one or two fingers in each quadrant of the visual field
  - d) give Mr. B. a piece of paper and a pen, and ask him to draw a clock

## CONTINUING EDUCATION STUDY ANSWER FORM

CE: 2.0 HRS CONTINUING EDUCATION

## The connection between neurosciences and dialysis: A quick neurological assessment for hemodialysis nurses

Volume 23, Number 3

Charlotte McCallum, NP-Adult, MN, CNeph(C), and Margaret Leonard, RN

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7.	a	b	с	d
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9.	а	b	с	d
10.	а	b	с	d

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# Pain assessment and management in hemodialysis patients

Charisse De Castro, PharmD Student, Laura Murphy, PharmD, and Marisa Battistella, BScPhm, PharmD, ACPR

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## LEARNING OBJECTIVES

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

- Describe the epidemiology and pathophysiology of pain in patients on hemodialysis
- Identify barriers to optimal pain management in this population
- Discuss analgesic considerations when choosing therapy for patients on hemodialysis
- Compare and contrast the strengths and limitations of the renal adaptation of the World Health Organization (WHO) analgesic ladder

## INTRODUCTION

The International Association for the Study of Pain defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage (Menkey, 1994)." Chronic pain is highly prevalent in hemodialysis patients, yet is under-diagnosed and under-treated. Several studies have described the impact and severity of pain in these patients, yet there is still a paucity of data regarding optimal management. The aims of this article are to review the studies that have explored pain assessment and management in patients on hemodialysis, and to propose quality improvement strategies that can be implemented in daily practice to address the problem of pain.

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## **EPIDEMIOLOGY OF PAIN**

Pain is one of the most common symptoms in patients with end stage renal disease (ESRD) (Cohen, 2007; Mercadante, 2005; Bailie, 2004). At least 50% of hemodialysis patients experience pain, and up to 82% of these patients report pain of moderate to severe intensity (Davison, 2003). Despite this high prevalence, a growing body of literature has shown that pain in the dialysis population is inadequately managed. In a cohort of Canadian hemodialysis patients, 75% were found to have a negative Pain Management Index, a score that is indicative of ineffective pain control (Davison, 2003). The Dialysis Outcomes and Practice Patterns Study (DOPPS) found that despite an increasing prevalence of chronic pain, analgesic use decreased, suggesting possible under-prescribing (Bailie, 2004). Furthermore, a recent systematic review reported rates of effective pain control in ESRD patients varying from 17% to 38%, and up to 84% of patients with significant pain receiving no analgesia (Wyne, 2011). Overall, this evidence highlights a lack of effective pain management strategies in dialysis facilities. There is a clear need for programs to ensure the timely identification, assessment, and provision of appropriate analgesia in these under-treated patients.

## PATHOPHYSIOLOGY

Pain experienced by dialysis patients is often multifactorial, and includes nociceptive, somatic, visceral, neuropathic, and complex regional pain syndromes (Davison, 2003). The etiology of pain may be secondary to co-morbidities (e.g., diabetes, vascular disease), the primary renal disease (e.g., polycystic kidney disease), consequences of renal failure (e.g., calciphylaxis, renal osteodystrophy), or the dialysis treatment itself (e.g., recurrent needle insertion, arteriovenous fistulas). Dialysis may also induce severe headaches as a result of a large amount of water and electrolyte shifts (Goksan, 2004). In a prospective cohort study of 205 Canadian hemodialysis patients, musculoskeletal pain was reported as the most common (65%) cause of pain, followed by dialysis procedure-related pain (14%), peripheral neuropathy (15%), and peripheral vascular disease (10%) (Davison, 2003). Distinguishing between the different types of pain and their potential causes is important in determining optimal management strategies.

## IMPACT OF PAIN ON OUTCOMES

Pain impacts multiple aspects of the patient's well-being, and is associated with psychological distress, impairment of interpersonal relationships, significant functional limitations, and excessive use of health care (Sanders, 1985; Von Korff 1988). Dialysis patients experience a tremendous symptom burden, yet pain alone accounts for up to 32% of the variability in health-related quality of life (Davison, 2010). Several studies have confirmed an inverse relationship between the existence of pain and dialysis patients' self-reported quality of life (Weisbord, 2005; Kimmel, 2003).

Observational studies suggest that under-managed pain has the potential to induce or exacerbate co-morbid conditions in ESRD, which may adversely affect dialysis treatment (Weisbord, 2005). In a cross-sectional study of Canadian hemodialysis patients by Davison et al. from 2001 to 2002, there was a significantly higher prevalence of depression, anxiety, severe irritability, inability to cope with stress, and insomnia in patients with moderate or severe chronic pain compared to patients with mild or no pain. In addition, patients with moderate or severe pain were found to be more likely to consider withdrawal from dialysis (Davison, 2005).

These findings emphasize that the ramifications of under-treated pain are extensive. Optimizing pain management in the hemodialysis population is essential to prevent the progression of psychiatric co-morbidities, optimize the use of health care resources and, ultimately, improve the patients' quality of life.

## BARRIERS TO ADEQUATE PAIN MANAGEMENT

Common barriers to adequate pain management include patient under-reporting of pain, fear of addiction and adverse effects, lack of staff time and training, and inadequate pain assessment (Anderson, 2000). Dialysis patients are frequently assessed by nephrologists due to the repetitive nature of the schedule, yet pain assessments are not routinely performed. Health care professionals should adopt a more active approach to screening pain, as patients often do not report pain unless asked explicitly (Barakzoy, 2006). Language is also a major barrier to optimal pain management, as a high proportion (up to 42%) of dialysis patients do not speak English (Salisbury, 2009).

Analgesic use is complicated by altered pharmacokinetics and pharmacodynamics in dialysis. This may be a perceived barrier by clinicians to optimize pain management. Effective prescribing of analgesics must be balanced with safety considerations, particularly in this fragile population. Advanced age, multiple co-morbidities, and polypharmacy further increase the potential risk for analgesic toxicities (Nayak-Rao, 2011). Other safety concerns must also be weighed for each patient when considering selected analgesics, including potential risks of delirium, falls, and misuse or abuse, particularly with opioid therapy (O'Neil, 2012). Routine screening for risk before prescribing and ongoing reassessment are necessary (Glick, 2011).

## PAIN ASSESSMENT

Pain assessment involves an organized and detailed history to elucidate the cause of pain, its location, quality, severity and, finally, the impact on physical, social, and emotional functioning (Glick, 2011). Clinical trials have used several general pain assessment tools in the dialysis population, including the Brief Pain Inventory (Calero, 2009; Gamondi, 2013; Golan, 2009), McGill Pain Questionnaire (Davison, 2003; Barakzoy, 2006; Calero, 2009; Harris, 2012; Masajtis-Zagajewska, 2011; Binik, 1982), and the Pain Management Index (Davison, 2003; Calero, 2009). The BC Renal Agency has developed a nephrology-specific pain measurement tool, accounting for different pain types, patient goals, medications, and effects on quality of life in chronic kidney disease patients. However, none of these tools have been validated specifically in the dialysis population, and it may be unrealistic to rely on multiple tools in a clinical setting. There remains a need for simple, validated screening and assessment tools for pain in the dialysis population.

Implementing routine pain screening is the first step to developing effective pain management strategies. Frequent measurement of pain intensity, quality, and impact on function is critical to identify patients with inadequate pain management and guide appropriate interventions. For example, symptoms of neuropathic pain likely have poor response to opioid therapy; adjuvants such as antidepressants or anticonvulsants may be required (Nayak-Rao, 2011).

## ANALGESIC CONSIDERATIONS IN DIALYSIS

The role of dialysis in the clearance of a drug and/or its metabolites is very complex. The properties of the parent drug and its metabolites have to be considered, as well as technical factors related to the dialysis procedure (Dean, 2004). Within the opioid class, lipophilic drugs with low solubility and high volume of distribution such as fentanyl and methadone are less likely to be removed with dialysis compared with less protein-avid and more water-soluble molecules like oxycodone, morphine, hydromorphone, and their metabolites (Glick, 2011). The extent of renal and non-renal clearances of the drug is also an important factor. For example, acetaminophen is mostly cleared by the liver, and so dialysis will have little effect upon its clearance. The pharmacokinetics of analgesics in ESRD is beyond the scope of this article, but is described in several nephrology review articles (Kurella, 2003; Dean, 2004; Launay-Vacher, 2005; Glick, 2011; Nayak-Rao, 2011).

Analgesic use involves a small margin between relieving pain and causing unwanted effects, especially in ESRD (Daines, 2004). Opioids can accumulate in the body and cause significant adverse effects such as respiratory depression, sedation and myoclonus (Davison, 2003; Kurella, 2003; Rehm, 2003). Conversely, effective pain control may be compromised if the analgesic is easily removed with hemodialysis. Routine monitoring during and after dialysis is essential to determine the need for supplemental analgesia and to identify signs and symptoms of toxicity (Salisbury, 2009). In general, analgesics should be started at low doses and titrated carefully in hemodialysis patients.

Table 1: Renal adaptation of the WHO Analgesic Ladder (Barakzoy, 2006; Murtagh, 2006; Salisbury, 2009; Glick, 2011)						
WHO Ladder	Analgesic	Recommendation	Adverse Effects			
Step 1: Mild Pain	Acetaminophen	The National Kidney Foundation recommends acetaminophen as the non-narcotic analgesic of choice for mild-to-moderate pain in ESRD.	Hepatotoxicity has been reported in persons with underlying liver disease or long-term alcohol use with doses exceeding 4,000 mg/day.			
	Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) (e.g., Ibuprofen, Naproxen)	Topical gels acceptable. Oral agents discouraged in patients with residual urine output, advanced age, or multiple co-morbidities.	Loss of residual renal function, sodium and water retention, hypertension, hyperkalemia, and increased gastrointestinal bleeding risk when compounded by uremic-induced poor platelet function.			
Step 2: Moderate Pain	Tramadol	Recommended. Safer than oxycodone, although dose adjustment may be necessary due to renal clearance.	Side effects are similar to those of opioids: nausea, central nervous system (CNS) depression, and constipation. Tramadol may cause seizures in conditions associated with a lowered seizure threshold. Risk for serotonin syndrome with concomitant serotonergic medications.			
	Oxycodone	Use cautiously. No data available on dialysis of oxycodone.	Nausea, CNS depression, and constipation.			
Step 3: Severe Pain	Hydromorphone	Use cautiously. Hydromorphone has been used without adverse effects in dialysis patients, but there are no data concerning dialysis of the metabolites, and metabolite accumulation is a risk.	Nausea, CNS depression, and constipation. Metabolite accumulation may cause neuro-excitation with agitation, confusion, and hallucinations.			
	Fentanyl	Recommended. Appears safe, at least over short periods. It is largely cleared by the liver, and metabolites are inactive.	Nausea, CNS depression, and constipation.			
	Methadone	Recommended. Appears safe, at least over short periods. It is largely cleared by the liver, and metabolites are inactive.	Nausea, CNS depression, and constipation. High potential for drug interactions.			
Unsafe: Codeine, Morphine, Meperidine, and Propoxyphene are not recommended in hemodialysis patients due to case reports of accumulation						

and toxicity in renal failure.

## **GUIDELINES FOR ANALGESIC USE IN DIALYSIS**

Although pharmacological reviews of analgesic use in renal failure have been published, there are no consensus guidelines for pain management specific to the renal context. The World Health Organization (WHO) three-step analgesic ladder has been recommended to guide treatment of patients with end stage renal disease in several review articles in nephrology literature (Kurella, 2003; Rehm, 2003; Davison, 2003; Davison, 2005). Recent prospective validation studies (Barakzoy, 2006; Salisbury, 2009) have demonstrated that implementation of a renal adaptation of the WHO analgesic ladder can significantly reduce pain scores in hemodialysis patients.

Details on the renal adaptation of the WHO analgesic ladder can be found in Table 1. In ESRD patients, acetaminophen, tramadol, and fentanyl are the most appropriate medications for mild (step 1), moderate (step 2) and severe (step 3) pain respectively. There is limited evidence on the use of buprenorphine, oxycodone and hydromorphone. Methadone is safe, but should only be prescribed by a clinician experienced in its use. Morphine and codeine are not recommended because of metabolite accumulation (Murtagh, 2007). Adjuvants such as anticonvulsants and antidepressants may be co-administered at any stage of the WHO ladder for neuropathic pain (Glick, 2011).

The use of the WHO ladder in dialysis has several limitations. First, the algorithm was originally devised for patients with cancer and may not directly apply to patients with chronic kidney disease (Williams, 2008). Second, it does not provide guidance on specific dosing of analgesics in hemodialysis. Lastly, long-term efficacy and the development of tolerance over time remains unknown, as only short-term studies have been conducted (Nayak-Rao, 2011). However, until further research is conducted, the WHO ladder is the only validated clinical tool available for use in hemodialysis patients.

Non-pharmacological options such as the use of ice, heat, or massage should also be considered as part of a multimodal approach to pain management. However, there is a lack of research on the use of complementary therapies for pain in patients with ESRD. Although they have not been studied in dialysis patients in particular, strategies such as transcutaneous electrical nerve stimulation (TENS), percutaneous electrical nerve stimulation (PENS), and acupuncture can be helpful in the treatment of neuropathic pain (Innis, 2006).

## CONCLUSION

Chronic pain is a common and disabling symptom for hemodialysis patients and adds significantly to their burden of disease (Nayak-Rao, 2011). Effective pain management can enhance patient outcomes such as patient comfort, safety, and satisfaction of care that will improve overall quality of life (Williams, 2008). Routine pain assessments and the use of clinical guidelines are evidence-based strategies that should be implemented in all dialysis facilities to improve the quality of patient care. There is a need for additional research to validate assessment tools, update pharmacokinetic studies and inform more detailed guidelines and clinical decision tools.

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## CONTINUING EDUCATION STUDY QUESTIONS

**CONTACT HOUR: 2.0 HRS** 

# Pain assessment and management in hemodialysis patients

Charisse De Castro, PharmD Student, Laura Murphy, PharmD, and Marisa Battistella, BScPhm, PharmD, ACPR

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- Rates of effective pain control in end stage renal disease (ESRD) patients have been reported to be as low as:
  - a) 17%
  - b) 25%
  - c) 44%
  - d) 60%
- 2. The most common cause of pain in hemodialysis patients is:
  - a) peripheral neuropathy
  - b) dialysis-related pain
  - c) peripheral vascular disease
  - d) musculoskeletal pain
- 3. Pain is associated with all of the following **except**:
  - a) withdrawal from dialysis
  - b) excessive use of health care
  - c) increased sleep
  - d) depression and anxiety
- 4. Barriers to adequate pain management in hemodialysis patients include all of the following **except**:a) lack of effective analgesics
  - b) language
  - c) inadequate pain assessments
  - d) altered pharmacokinetics in dialysis

- 5. Which of the following statements regarding the renal WHO analgesic ladder in hemodialysis patients is **false**:
  - a) studies have shown that it can significantly reduce pain scores
  - b) studies have shown that it can also decrease analgesic-related toxicity
  - c) adjuvants can be administered at any step for neuropathic pain
  - d) it describes a step-wise approach for analgesic use based on severity of pain
- 6. E.D. is a 47-year-old female on hemodialysis. She is already taking the maximum recommended dose of acetaminophen, but still continues to experience pain of moderate severity. Which of the following is the **most appropriate** analgesic to consider adding next?
  - a) codeine
  - b) morphine
  - c) fentanyl
  - d) tramadol
- Limitations of the WHO analgesic ladder include all of the following except:
  - a) it has not been validated in the hemodialysis population
  - b) long-term efficacy remains unknown
  - c) it does not provide dosing recommendations
  - d) it was originally devised for cancer patients

- A.P. is a 34-year-old male on hemodialysis. He was recently started on tramadol for his pain. What adverse effect(s) should you monitor for?
  - a) constipation
  - b) seizures
  - c) respiratory depression
  - d) all of the above
- 9. E.R. is an 81-year-old female with end stage renal disease who is starting on hemodialysis. Which of the following opioids should be avoided due to the potential for accumulation in ESRD?
  - a) codeine
  - b) fentanyl
  - c) methadone
  - d) hydromorphone
- 10. Adverse effects of NSAIDs (non-steroidal anti-inflammatory drugs) include all of the following **except**:
  - xcept.
  - a) gastrointestinal bleeding
  - b) liver toxicity
  - c) hyperkalemia
  - d) hypertension

# CONTINUING EDUCATION STUDY ANSWER FORM

## CE: 2.0 HRS CONTINUING EDUCATION

# Pain assessment and management in hemodialysis patients

Volume 23, Number 3

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	2. The content was related to the objectives.	1	2	3	4	5
	3. This study format was effective for the content	t. 1	2	3	4	5
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## PRACTICE CORNER

## This is who I am

Janet Baker, RN, BN, CNeph(C), and Sophia Wu, RN

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## BACKGROUND

Our hemodialysis patients are living longer, but their general life expectancy is still below that of the general population. According to 2012 USRDS information, the mortality rate of our patients is 6.3 to 8.2 times greater than the general population. As patients with a chronic disorder, they attend hemodialysis on average three times per week. Multiplied by the expected time in years on hemodialysis, a patient could be seen up to 1,550 times or 624 hours per year by the hemodialysis unit staff. This may actually be an underestimation due to additional treatments or procedures that hemodialysis patients may require above and beyond the routine hemodialysis sessions.

Staff in most renal units would also voice that they know their patients very well based on the frequent interactions they have. While undergoing treatments, patients talk about their lives, their families and their activities. Staff might also talk about their families and experiences outside of their work lives in conversations with patients. Through these interactions there is an interpersonal familiarity and comfort. Despite this, how well do we really know our patients? Of course, we get to know their prescription for hemodialysis, how many blankets they like on their chairs, or their transportation concerns. But, do we really know who our patients are as individuals? Do we know their life history, their achievements, or what makes them happy? Do we know what they would like to be called? Even if a few staff members do know these valuable pieces of information, how do we share it with our co-workers?

#### **ABOUT THE AUTHORS**

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

As expected, given the burden of illness with hemodialysis patients, periodically a patient would die and we would read the obituary out of interest and respect. We were often surprised by the accomplishments that were featured in these write-ups and by the stories about our patients that had gone unspoken. Reading the obituary would lead to discussion amongst the staff. Did we know these wonderful things about our patients? Did the patient ever share any of these details with us? Did we ever provide an opportunity for them to share what was important?

### THE OPPORTUNITY

In Ontario, the Ministry of Health and Long-Term Care (MoHLTC) funded a program entitled the Late Career Nurse Initiative. The program was created as a means to support experienced nurses, allowing them to participate in project planning and execution experiences, and to build on their nursing knowledge, skills and experience in a less physically challenging nursing role. We submitted an application that included our goals, timelines, identified nursing staff and our expected outcomes should we be approved for a project

We submitted our proposal and found out in the fall of 2011 that our project had been approved. We now had to get organized, proceed with our project, and complete it within 16 weeks.

## **OUR INITIATIVE**

The team brainstormed some potential project ideas that would meld into the mandate of the MoHLTC Late Career Nurse Initiative. We focused on what we could do that would have a positive impact on our patients' hemodialysis experience. Our goal was to have a patient-focused, rather than a staff-focused project.

The Registered Nurses Association of Ontario has published Nursing Best Practice Guidelines entitled *Establishing Therapeutic Relationships* (RNAO, 2006). Recommendation 1 proposes that, "The nurse must acquire the necessary knowledge to participate effectively in therapeutic relationships" (p. 8).The document acknowledges the need for nurses to be able to understand our patients' world by identifying and confirming the items that are meaningful to them and acknowledging their histories.

The College of Nurses of Ontario includes client-centred care as one of its practice standards within the document Therapeutic Nurse-Client Relationship (CNO, 2006). It states that, "Nurses work with the client to ensure that all professional behaviours and actions meet the therapeutic needs of the clients" (Standard 2, p. 8). One of the ways that is discussed that we, as nurses, can meet this standard is by actively engaging the patients, as partners in care. It discusses the patient as being the expert on his/ her life, wishes and preferences and the importance of the nurses caring for each patient understanding these elements.

In the end, we decided to develop a tool that gave us the chance to know our patients in more detail and in a different way. Not only would the chosen nurse participate in the project, but the patients would also be involved. Our main goals included the following:

- To provide an opportunity for a nurse to sit with a patient and have one-on-one interaction without it having to be about specific dialysis care
- To let the patients know that we acknowledge them as individuals, not as just dialysis patients
- To build rapport with the patients, with the hope that if patients are able to communicate their values they will also be more involved in the partnership of their care
- To allow the patient an opportunity to voice some preferences that would hopefully make their dialysis experience more personal
- To show respect and caring to our patients
- To communicate to all staff what the patient preferences are, as this tool, once filled in, is housed within the patient chart and available to all staff.

## THE PROCESS

Our nurse who participated in this initiative had time to review existing tools, talk to staff for their input into the types of information they might see as valuable, and develop a tool for use within our unit "This is who I am" (Figure 1). Once the questions were organized, she formatted them into a one-page tool. All staff was kept informed along the way and were aware of how the project was progressing. The nurse was allocated time to sit with each patient individually and carry out the interviews. The process was explained to each patient and they had an opportunity to decline if they chose. We had 131 patients in the main dialysis unit and only two patients declined, and their wishes not to participate were respected.

## THE OUTCOMES

The evaluated process revealed that the project was a success based on the goals of the initiative. We obtained our feedback from two sources, primarily anecdotal comments from both the nurse who conducted the interviews with patients and from the patients who were interviewed. The nurse involved in the project communicated that she very much enjoyed sitting and chatting with the patients in a different way than she had before. She was surprised to discover so much about people whom she believed she already knew quite well but, in fact, did not. She conveyed that she enjoyed the one-on-one time with the patients.

Patients reported a positive experience, as well. A few patients asked to have the nurse return and sit with them and talk to them, as they had enjoyed that interaction very much. We also had feedback from some patients that they felt more valued after the nurse had spent the time with them.

Our unit continues to use the sheet "This is who I am" with all patients. It has become part of our new patient chart, and is present for all patients. It has become the responsibility of the primary nurse to complete the information and the form is stored on the chart for all staff to be able to see and use.

We were fortunate to have been able to participate in the MoHLTC Late Career Nurse Initiative. This rewarding initiative has benefitted both staff and patients alike.

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Figure 1: "This is who I am" form				
Halton Healthcare	This is who I an	ן		
PATIENT NAME:	but I like to be called:			
OCCUPATION:				
FAMILY AND FRIENDS:				
MY FAVOURITE THINGS:				
TV show:				
Music:				
Sports:				
Food:				
Activities/Hobbies:				
Pets:				
WHAT ELSE				
Something that stresses me:				
Something that makes me happy: _				
Something I want you to know abou	ut me:			
AT HOME I USE				
Glasses/Contacts: Dentu	res: Hearing Aid: Cane/Walker:			
My sleep schedule is from:	to:			
For transportation I use:				
	Halton Healthcare Renal Services			

# Understanding the hemodialysis patient with dementia

Gavril Hercz, MD

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## DILEMMA

Dear Drs. Hercz and Novak,

Our hemodialysis unit has an elderly patient attending on a chronic schedule who has been known to our program for many years. Due to some cognitive issues, she is forgetful and can be a bit demanding towards staff at times. The following dialysis, however, she does not seem to recall any altercations with staff from the previous treatment. She always acts as if nothing has happened and we start over. She has family who provides support and we have arranged for them to be available during the hemodialysis session to assist us with managing her behaviours. Last month she had a nurse who was new to hemodialysis looking after her. The patient was short-tempered with this nurse. At one point during the treatment, she slapped the nurse and verbally abused her.

Our normal approach to this type of behaviour is to have a zero-tolerance policy and have her removed from the unit until the next scheduled treatment, with instructions to attend the ER as an alternative if she became ill. However, given this patient's cognitive issues, we feel unable to do this. I would like to address this issue but, as she is so forgetful, I am unsure that talking to her would be of any long-term benefit, as I don't think there will be retention of the discussion and, therefore, no subsequent behaviour change. There has also been talk on our unit about not assigning this nurse to this patient in future. However, this raises the dilemma of preferential selection either by staff or by patient for treatment, and I am not sure I agree with that.

Worst of all is the fact that we have had feelings of resentment against this patient when she struck her nurse, and it is difficult to get past those feelings.

How can we address our feelings about her and how can we best look after her under the circumstances?

## RESPONSE

This again is a very challenging situation, raising numerous issues beyond our own troubling feelings. It touches on dialysis unit policies, and ethical applications of these policies, as well as the utility of complex therapies in patients who are becoming intellectually compromised. We must start with an important caveat. The material that follows is in the vein of a general discussion of the topic, rather than specific therapeutic recommendations. Certainly we do not have adequate clinical information and are not her treating physicians. We hope that the current and future responses will be viewed in that manner.

In these situations, the clinical scenario these patients present with taps into all kinds of conflicts within us, hence our sense of unease and, perhaps, the evoking of troubling anxiety. We lack a reasonable context for the patient's behaviour, a framework that "makes sense". On the one hand we wish to care for her and would expect a behavioural response in keeping with our usual concept of "appropriate patient behaviour". As a result of her cognitive issues, she may not remember her disturbing interactions with the staff during the previous dialysis sessions. Consequently, there is a lack of continuity, a difficulty in processing the event by discussing it with her and, more importantly, the possibility that positive change could occur. It is as if each day is being replayed, without hope for improvement. It is not unreasonable that this may arouse all kinds of conflicted feelings, as this process runs counter not only to one's identity of a healer, but also to all the values and processes that we value in ourselves as vital, growing human beings.

Given that the patient may have some element of dementia, it is not unreasonable that she would become increasingly anxious with any changes either in her environment or with her caregivers. Patients such as her do best with stable, predictable and unchanging therapies. As such, being looked after by a new nurse, especially one who might be somewhat insecure and anxious given her recent introduction to dialysis therapy, would not unexpectedly result in an acute aggravation of the "usual situation". Any one of us would become more anxious when faced with a new and demanding work environment. This would be exacerbated by having to look after a patient with whom one cannot establish a "mutual contractual agreement" as to the scope of care. It is also possible that the new nurse would have been forewarned about the patient, making her care more anxiety prone. On some level, we all empathize with her nurse, having ourselves been in similar situations, reconnecting us

with suppressed feelings of anger, confusion and anxiety. We have all experienced the conflicted feelings of trying to help someone in need and being answered with verbal and/or physical aggression. At these times, it is as if we are in the middle of an emotional hurricane, trying to keep ourselves balanced between keeping our composure while buffeted by our own aggressive retaliatory sensations. We may then channel the latter into "zero tolerance" policies. Although these may be helpful, we also realize the futility of their application in patients who cannot process the information. We may be left with our "undischarged" retaliatory sensations swirling around inside of us, needing to be released, but with nowhere to go.

## What can we do?

It may not be enough to simply appreciate the situation logically, as the outburst of a confused patient. The persistence of the issue attests to that. The answer lies within ourselves. The more we become aware of our own conflicted feelings, the more we can speak about them either with "ourselves" or with our colleagues, the easier we can reconnect empathetically with the patient. As indicated above, there are numerous internal conflicts that may have been activated. The foremost issue is our instinctual response to a verbal or physical attack, which then has to be suppressed due to the nature of the situation. This is made all the more difficult as we can't carry these feelings against someone who is not competent. It would be easier to have these feelings, and allow us some relief, if the situation involved "a jerk who cut us off on the freeway". The other conflict involves the seeming futility of providing care when each clinical encounter is relived as if new, without hope of change. Lastly, we hope we would have lain to rest all those earlier sensations of inadequate competence, which we appreciate in our colleague, and now are reactivated within ourselves.

We hope everyone has enjoyed a pleasant summer with family and friends and look forward to seeing you in Newfoundland.

Editors' note: Due to summer schedules and well-deserved holiday time, this issue's response was prepared solely by Dr. Gavril Hercz



# **Guidelines for authors**

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

## Which topics are appropriate for letters to the editor?

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

## What types of manuscripts are suitable for publication?

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

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

## How should the manuscript be prepared?

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

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

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

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

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

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

## How should the manuscript be submitted?

#### Email your manuscript to: athomas6@cogeco.ca

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

## How are manuscripts selected for the CANNT Journal?

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

## **Checklist for authors**

#### $\checkmark$ Cover letter

✓ Article

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

# Lignes directrices à l'intention des auteurs

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

## Quels sont les sujets d'article appropriés?

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

## Quels types de manuscrits conviennent à la publication?

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

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

## Comment les manuscrits doivent-ils être présentés?

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

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

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

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

**Texte:** Les sigles, abréviations ou acronymes doivent être écrits au long la première fois qu'ils apparaissent dans le texte, suivis de l'abréviation entre parenthèses; p. ex., Association canadienne des infirmières et infirmiers et des technologues de néphrologie (ACITN). Les noms génériques des médicaments doivent être employés. Les unités de mesure doivent être indiquées selon le Système international d'unités (SI). Les références doivent être citées dans le texte en utilisant le format de l'AAP. Une liste de références comprenant la bibliographie complète de toutes les références utilisées doit suivre le texte. **Tableaux/Figures :** Les manuscrits ne doivent inclure que les tableaux et figures (incluant schémas, illustrations, croquis, etc.) visant à clarifier certains détails. Les auteurs qui utilisent des tableaux et des figures qui ont déjà fait l'objet d'une publication doivent fournir l'autorisation écrite de l'éditeur d'origine et la joindre au manuscrit soumis.

## De quelle manière doit-on soumettre les manuscrits?

Veuillez envoyer par courriel votre manuscrit à : athomas6@cogeco.ca

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

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

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

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

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- Références (sur une feuille distincte)
- Tableaux (un par page)
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CATHFLO® (alteplase, recombinant) is indicated for the restoration of function to central venous access devices.

Product Monograph available upon request.

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