Canadian Association of Nephrology Nurses and Technologists
Nephrology Nursing Standards and Practice
Recommendations

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PREFACE

Nephrology nursing is a specialized area of nursing practice focusing on needs of patients with kidney disease and their families. Practice areas and opportunities in nephrology nursing are quite diverse but very intricately connected to provide expert nursing care across a complex chronic illness continuum. This specialized care requires the nephrology nurse to promote competent, safe, ethical care, and demonstrate current specialty knowledge and practice. Standards help to ensure these values are upheld.

In the last edition of the CANNT Nursing Standards and Practice Recommendations, the CANNT Board of Directors fulfilled its’ vision to provide a document that was broad in depth and scope that more clearly articulated the magnitude of nephrology nursing practice in Canada. The CANNT nursing standards have been developed to be congruent with national and provincial standards, are broad in scope, and allow for institutional and provincial interpretation and variation by providing a framework for nephrology nursing practice.

Nursing practice recommendations are a companion document for the nephrology nursing standards. They are meant to compliment and further delineate the various practice areas in nephrology nursing. These recommendations address the areas of chronic illness management, conservative management, advance care planning, palliative care, patient education and self management, blood pressure management, anemia, bone and mineral metabolism, nutrition and diet therapy, diabetes management, cardiovascular risk factor management, chronic kidney disease stage 1-5, hemodialysis, peritoneal dialysis, self managed dialysis, and transplantation.

Numerous nephrology nurses across Canada have made substantial contributions to the CANNT Nephrology Nursing Standards and Practice Recommendations and their revision. It is both a humbling and exhilarating experience to work with the caliber of nurses who constitute the CANNT Standards of Practice Committee, expert content reviewers, and contributors. Please join me in thanking them all for their diligence, consistency, patience, and expert knowledge. I would also like to acknowledge the important contribution of previous working groups who have given of their time and experience to lay a foundation for us to continue building on.

Marsha Wood RN, BN, MN, CNeph (C)
CANNT Nursing Standards and Practice Recommendations Project Leader
Introduction

Standards demonstrate to the public, government and other stakeholders that a profession is dedicated to maintaining public trust and upholding the criteria of its professional practice (Canadian Nurses Association (CNA), 2007). The CANNT Nephrology Nursing Standards provide a framework for nephrology nursing practice, linking professional practice accountabilities, competence, research, leadership and quality.

Historical Background

In 1968, the Canadian Society of Extracorporeal Technicians (CANSECT) was formed and Letters Patent were granted by the Canadian government. From 1968 to 1974, CANSECT was comprised of members involved in the fields of heart & lung perfusion and dialysis. These two different disciplines were linked by the common concept of extracorporeal circulation. In 1975, the differences between these two groups grew to outweigh the common purpose that brought them together. The two groups separated and the dialysis membership adopted the name, Canadian Society of Perfusionists (C.S.P.). In 1977, this group became the Canadian Society of Dialysis Perfusionists (CSDP) or the Societe canadienne des perfusionistes en dialyse. The goal of the CSDP was to share and improve the quality of extracorporeal technology.

In 1984, the CSDP’s name was changed to the Canadian Association of Nephrology Nurses and Technicians (CANNT) or L'Association canadienne des infirmieres en techniciens de nephrologie. In 1996 the name was altered to the Canadian Association of Nephrology Nurses and Technologists. This name change reflects not only the growth and expansion that has occurred in our specialty, but emphasizes our increasing awareness of identity – who we are and what we do. We are nurses and technologists involved in the specialized care of nephrology patients. We care for patients during the entire continuum of chronic kidney disease; during conservative management; throughout all renal replacement modalities (including dialysis and transplantation); and palliative management. We care for patients who require total care, limited care, and self care. We work in a variety of geographical locations, in hospitals, off-site facilities, satellite centres, and in community centers. We care for patients and actively include family and others in the care process.

Our name changes provide significant insight into our changed perceptions of ourselves. Our initial interest was directed solely towards the new field of extracorporeal circulation. Today, we see hemodialysis as one modality of care; one part of the whole. We have shifted our emphasis to the concept of holistic patient care, while recognizing that the different modalities are an important aspect of the total plan of care. Our membership's interests have expanded and kept pace with the changes in treatment concepts. The name changes reflect our evolving identity and are a constant reminder that we must not build barriers to the creative ideas upon which our continued growth is contingent.
CANNT’s Mission

To provide leadership and promote the best possible nephrology care and practice through education, research, and communication.

CANNT’s Vision

CANNT as the keystone of evidence in nephrology nursing and technological care in Canada.

Context of Practice

Nephrology nursing is a growing and evolving specialty in Canada. Certification in nephrology nursing (CNeph(C)) through the Canadian Nurses Association is increasing, with more than 1200 registered nurses holding this designation (CANNT, 2013). Nephrology nurses practice in all provinces and territories including urban teaching centres, rural and remote settings. In each province and territory there is a nursing regulatory body that oversees and regulates the practice of nursing.

The incidence and prevalence of chronic kidney disease in Canada have increased dramatically over the last two decades (Canadian Institute for Health Information (CIHI), 2013). As of December 31, 2011, there were 40,385 people in Canada being treated for ESRD; 58% (23,423) were on dialysis and 42% (16,962) were living with a functioning kidney transplant. The prevalence rate for patients being treated by dialysis has increased nearly 160% since 1992 and during the same period, the prevalence rate of patients with kidney transplants more than doubled to 491.9 RPMP (Canadian Organ Replacement Register (CORR), 2012). One in 10 Canadians have kidney disease, and the number being treated for kidney failure has tripled over the past 20 years (Kidney Foundation of Canada (KFOC), 2013). The most common cause of chronic kidney disease is type 2 diabetes followed by renal vascular disease, primarily hypertension. At risk ethnic populations for chronic kidney disease include Aboriginal, Asian, South Asian, Pacific Island, African, Caribbean, and Hispanic (KFOC, 2007; CSN 2013).

Nephrology nurses provide care across the life span and health continuum, including acute and chronic care to patients with kidney disease. They are involved in health promotion, illness prevention, management of acute, chronic, and end-of-life care, and rehabilitation. They practice in diverse settings and clinical environments including, but not limited to, CKD stage 1-5 (not on dialysis) clinics, hemodialysis and peritoneal dialysis clinics, acute care nephrology wards, and kidney and kidney/pancreas transplant wards and clinics.

Canadian nephrology nurses function in a variety of roles including expert staff Registered Nurses and Registered/Licensed Practical Nurses, advanced practice nurses, educators, researchers, leaders, and administrators. Kidney disease care relies on a multidisciplinary approach with nurses playing a pivotal role in coordinating this care. A challenge for nephrology nursing will be the ability to change and respond to the unique
health care needs of a growing aging kidney disease population. Nursing standards and practice recommendations, help to articulate this specialty role to the public, other health care providers, and stakeholder groups that strive to improve care for patients at risk for and living with kidney disease.

References


NEPHROLOGY NURSING STANDARDS

Direct Care

Assessment

The nephrology nurse provides a comprehensive health assessment for patients with kidney disease appropriate to the nephrology nursing practice setting.

The nephrology nurse demonstrates this standard by:

- assessing patient and family understanding of chronic kidney disease;
- assessing patient and family understanding of the impact of chronic kidney disease;
- assessing patient and family readiness to learn about kidney disease;
- assessing patient self care abilities, health goals, and expected outcomes;
- using appropriate evidence based tools/techniques for interviewing and collecting patient information;
- using health assessment frameworks appropriate for chronic disease management;
- assessing known risk factors associated with kidney disease;
- synthesizing data in a holistic manner to understand patient health issues and patient perception of health and goals for health; and
- completing a physical assessment pertinent to the individual with kidney disease.

Planning

The nephrology nurse develops a plan of care appropriate to the level of kidney disease and individualized to the patient’s needs.

The nephrology nurse demonstrates this standard by:

- collaborating with the patient and family to understand their goals and expected outcomes for health;
- collaborating and coordinating care with appropriate health care team members who can help patients and families achieve expected outcomes;
- ensuring the plan of care includes health promotion and prevention strategies to reduce and prevent illness;
- including strategies that promote independence, autonomy, and self reliance; and
- incorporating best demonstrated practice strategies and outcomes for managing chronic kidney disease along the health/illness trajectory.
Implementation

The nephrology nurse implements and coordinates the plan of care for patients with kidney disease.

The nephrology nurse demonstrates this standard by:

- educating patients and families about stages of kidney disease, treatments, and best practices;
- advocating for resources to help patients and families achieve optimal health;
- coordinating, modifying, and documenting the plan of care;
- collaborating with members of the nephrology team and community; and
- providing kidney disease care.

Evaluation

The nephrology nurse continually evaluates the care and outcomes for patients with kidney disease.

The nephrology nurse demonstrates this standard by:

- evaluating the patient response to interventions;
- confirming with patients and families that established outcomes have been achieved;
- critically analyzing clinical outcomes against best demonstrated practice outcomes for kidney disease;
- documenting outcomes of kidney disease care and achievement of patient health goals; and
- revising the plan of care to meet ongoing and changing health care needs.

Collaboration

The nephrology nurse collaborates with the patient and family, and all members of the health care team across the continuum of care to provide and coordinate services to the kidney disease population.

The nephrology nurse demonstrates this standard by:

- providing consultative services;
- initiating necessary referrals and consults to allied health professionals and community organizations to achieve expected outcomes of the kidney disease plan of care;
- participating in committees/work groups established for the purpose of improving kidney disease care;
• sharing expert nephrology nursing knowledge with the team to promote excellence in kidney disease care;
• providing and participating in educational initiatives aimed at increasing the knowledge, skill, and ability of the health care team and community organizations involved in the care of patients with kidney disease; and
• ensuring information pertaining to assessment, planning, and provision of care (including anticipated outcomes) is documented and accessible to all members of the multidisciplinary team involved in the care of the patient with kidney disease.

**Competence**

The nephrology nurse acquires, maintains and continues to develop knowledge, skill and judgment to provide the best care possible to patients with kidney disease.

The nephrology nurse demonstrates this standard by:

• being responsible for their own learning and professional development;
• identifying gaps in knowledge and formulating a plan to meet their learning needs;
• participating in nephrology unit/program orientation programs, professional practice committees, and peer teaching/learning opportunities;
• acquiring and maintaining Canadian Nurses Association certification in nephrology nursing, CNeph(C);
• attending conferences, workshops, and educational activities pertinent to nephrology nursing practice;
• staying current with trends and research in nephrology nursing;
• using and promoting the best evidence to provide chronic kidney disease care;
• participating in professional reflective practice;
• participating in performance review/evaluation; and
• providing education and sharing expert knowledge through mentorship and preceptor opportunities.

**Evidence Based Nursing Practice**

The nephrology nurse participates in and facilitates evidence based practice and research initiatives to improve nephrology nursing practice and kidney disease care.

The nephrology nurse demonstrates this standard by:

• identifying questions and issues related to nephrology nursing practice and kidney disease care;
• identifying knowledge gaps in nephrology nursing practice and kidney disease care;
• critically appraising the validity, relevance, and applicability of research findings to address patient issues;
considering nephrology expertise, patient preferences, other forms of care, and available resources in relation to available evidence;

- applying knowledge gained from research and best demonstrated practices to care for the patient with kidney disease;
- integrating relevant nephrology related research into nursing policies and procedures and quality care outcome initiatives;
- participating in nursing, collaborative interdisciplinary, and allied health research;
- developing research proposals in accordance with organizational research review standards and ethics; and
- disseminating research findings through abstracts, presentations, and publication.

Leadership

Advocacy

The nephrology nurse advocates for improving the care for and quality of life of patients with kidney disease.

The nephrology nurse demonstrates this standard by:

- empowering patients and families to develop realistic, achievable, patient-centred health goals, and collaborating on a plan of care that includes advance directives;
- collaborating with health care team members and the patient and their family to implement strategies to achieve patient-centred health goals;
- educating other health professionals about the needs and challenges of patients with kidney disease;
- communicating with the patient, family, and members of the health care team regarding full disclosure of treatment options including the option of not having dialysis or withdrawal of renal replacement therapy;
- providing information about and promoting advance care directives;
- providing awareness of the availability of palliative care services;
- identifying gaps in the care of patients with kidney disease and taking actions to narrow and close these gaps;
- participating in committees, work groups, political lobbying activities, and/or other activities aimed at improving the care of patients with kidney disease; and
- following appropriate organizational policy/procedure when a substitute decision maker needs to be involved in care and end of life care.

Professional Leadership

The nephrology nurse demonstrates professional leadership by providing, facilitating, and promoting the best possible care for patients with kidney disease.
The nephrology nurse demonstrates this standard by:

- taking initiative to improve kidney disease care;
- role-modeling professional values, beliefs, and attributes (e.g., acquiring nephrology nursing certification, promoting continuing education, and developing and achieving annual professional reflective practice goals);
- collaborating with patients and their families and the health team to provide professional practice that respects the rights of patients;
- advocating for patients, a patient-centered approach to care, a healthy workplace and the nursing profession;
- providing direction to, collaborating with, and sharing knowledge and expertise with novices, students, and unregulated health care providers;
- acting as a role model utilizing mentorship characteristics and ideally becoming a formal mentor;
- promoting best demonstrated practices;
- participating in nursing associations, committees, or interest groups;
- providing leadership through formal and informal roles (e.g., team leader, charge nurse, preceptor);
- taking action to resolve conflict; and
- developing innovative solutions to practice issues.

**Quality Improvement**

The nephrology nurse facilitates improving the quality, safety, effectiveness, efficiency of, and satisfaction with kidney disease care.

The nephrology nurse demonstrates this standard by:

- maintaining current knowledge about kidney disease care and best demonstrated practices;
- identifying opportunities to improve practice and kidney disease outcomes;
- participating in quality improvement teams and quality assurance activities;
- collaborating to identify quality indicators and;
- evaluating outcomes of interventions in kidney disease programs.

**Resource Awareness**

The nephrology nurse utilizes resources to provide effective and efficient kidney disease care.

The nephrology nurse demonstrates this standard by:

- making efforts to reduce duplication of services;
implementing strategies to reduce fragmentation of care;
participating in quality improvement initiatives;
utilizing best demonstrated practices; and
utilizing human and material resources effectively and efficiently;
gaining knowledge of new technologies (i.e. tablets/internet) and guiding patient in filtering data).

Ethics in Nephrology Nursing Practice

Consideration of ethical issues is an essential component of providing care within the therapeutic nurse-patient relationship (College of Nurses of Ontario [CNO], 2009). The success of treatment for chronic kidney disease has given rise to an array of ethical concerns which are here to stay; as current problems are solved, new ones will surface (Starzomski, 2006). Nephrology nurses encounter ethical conflict, uncertainty and moral distress in their everyday practice due in part to continuous changes in the health care system, technology and societal values. Although they may not experience the same situation in the same way, understanding and communicating beliefs and values may help nephrology nurses to prevent ethical conflicts and work through them when they do occur (CNO, 2009).

The relationships among nephrology nurses, patients and families, and other members of the health care team is a matrix that is rich and complex, with the nurse-patient relationship being a particularly unique one due to its frequency and length (Morehouse, Colvin & Maykut, 2001). The main requirement of caring, ethical nephrology nursing practice is advocating in the best interest of patients, which may be challenging at times. For example, discussions about allocating resources in a fair manner may be difficult for nephrology nurses because they have professional responsibilities at differing, and potentially conflicting, individual, institutional, and societal levels (Starzomski, 2006).

Ethical decision making in health care requires thoughtful critical thinking and a clear understanding of personal values in the presence of communication and collaboration (Starzomski, 2006). Dilemmas happen when there is a difference between what ought to be occurring in a given situation and what actually is occurring. In nephrology nursing, many of the ethical issues that arise involve high technology and life-sustaining treatments (Landreneau & Ward-Smith, 2006; Starzomski, 2006). The aim in difficult situations is not perfection, but to make a good decision about feasible alternatives. This may involve ethical principles, professional norms, institutional policies, and legal precedents.

The nephrology nurse understands, upholds and promotes the ethical standards of the nursing profession in the care of patients with kidney disease.

The nephrology nurse demonstrates this standard by:
• presenting his or her name, title and role clearly and accurately and acting in a way that promotes respect for the nursing profession;
• making the patient the primary concern in providing nursing care by listening to, understanding, and respecting the values and following the wishes of the patient within the obligations of the law and standards of practice;
• providing care that preserves and protects patient dignity;
• demonstrating honesty and integrity;
• protecting patient privacy and confidentiality;
• recognizing, respecting and promoting the patient’s right to be informed and make informed choices;
• promoting and maintaining respectful communication in all professional interactions by recognizing and respecting the valuable contributions of other members of the health care team;
• treating all others in a respectful manner;
• making equitable decisions about the allocation of resources based on patient needs;
• identifying the effect of his or her own values, beliefs and experiences in carrying out nursing practice activities;
• recognizing and identifying ethical concerns and issues and taking action to prevent or resolve them by consulting with the appropriate person or body;
• recognizing potential conflicts and evaluating the effectiveness of actions;
• initiating, maintaining and terminating nurse-patient relationships in an appropriate manner.


References


NEPHROLOGY NURSING PRACTICE RECOMMENDATIONS SPANNING THE CONTINUUM OF CHRONIC KIDNEY DISEASE CARE

Chronic Kidney Disease Self-Management Strategies

Chronic illness is the leading cause of death and disability in Canada (Chronic Disease Prevention Alliance of Canada, 2013) and can be challenging for patients, their families, and those who provide their care. From the time a patient is diagnosed with a chronic illness they are faced with multiple issues that require many decisions throughout a dynamic trajectory which may include periods of stability and crisis. How they manage their decision making, and the support they receive, is key to how they cope and live with their illness. (Registered Nurses Association of Ontario, 2009). Many patients with chronic kidney disease live with one or more chronic illnesses; diabetes, cardiac, vascular, and pulmonary diseases are among those more common (Lorig, Holman, Sobel & Laurent, 2006). Chronic illness impacts both physical and psychosocial health and well being for patients. Learning to live with and manage symptoms of chronic illness is an important strategy for patients with chronic kidney disease.

A major part of chronic illness management relies on patient self-management which is associated with improved patient outcomes (Center for Disease Control and Prevention, 2011; Costantini, L., 2006; Curtain, Mapes, Schatell, Burrows-Hudson, 2005). The ultimate goal of patient education is to achieve long-lasting changes in behavior by providing knowledge, skills, and abilities that allow patients to make autonomous decisions and take ownership of their care to improve their own outcomes (Thomas-Hawkins & Zazworsky, 2005). Nephrology nurses assist patients across the continuum of kidney disease to develop skills and strategies to recognize and manage symptoms associated with disease, complex diet and medication plans, as well as competencies required to self-manage peritoneal dialysis or hemodialysis. The nephrology nurse complements traditional education, which consists of giving information and teaching technical skills with self-management education. Patients and families that receive adequate self-management support become an additional resource in the larger process of chronic disease management (Singh, 2008).

Patients who participate in decision making with their medical teams have been shown to have increased satisfaction with their decisions, less anxiety and an increased sense of wellbeing (Marron et al., 2005) A guiding principle in the support of self management is a process led by the patient and nurse supported and facilitated. (Registered Nurses Association of Ontario (RNAO), 2010). A critical part of nephrology nursing care is the provision and ongoing reinforcement of education and support for patient self management (Kallenbach, Gutch, Stoner, & Corea; 2005).
Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses patient and family needs related to CKD self management strategies including but not limited to:

- ability to make decisions about their care;
- coping strategies that could assist with care management;
- degree of willingness to manage their chronic illness;
- readiness for change;
- learning needs;
- identifying barriers to achieving patient goals; and
- identifying support systems available.

Collaborates with the patient and family to develop a plan to manage CKD and improve outcomes:

- identifies patient’s ability to make decisions regarding their care;
- provides the patient and family with information about all options so that they are able to participate fully in decisions about their care and make informed choices;
- explores patient goals and helps them to be able to discuss strategies to attain them;
- encourages the identification and use of community resources to address needs;
- provides information about peer support groups and self-management workshops; and
- encourages the use of stress management and relaxation methods.

Implements self-management education by developing problem-solving skills. This education consists of, but is not limited to, encouraging patients and families to:

- identify their problems;
- make decisions;
- set their goals;
- take appropriate actions; and
- seek out available resources.

Collaborates with other disciplines to eliminate duplication of resources, reduce fragmentation of care, and ensure optimal resource management to meet the needs of the patient and family:

- collaborates with the patient, family, and other essential disciplines and community resources for optimal care delivery;
- documents and communicates the plan of care;
- evaluates the effectiveness of the plan of care with the patient;
- communicates outcomes and changes to the plan of care with other health
professionals and agencies involved in fulfillment of the plan of care; and
• ensures those involved in the plan of care understand each member’s role and responsibilities for achieving outcomes as outlined in the plan of care.

Links to clinical resources

Decision Support for Adults Living with Chronic Kidney Disease: Registered Nurses of Ontario (RNAO) Nursing Best Practice Guideline (2009).
http://rnao.ca/bpg/guidelines/decision-support-adults-living-chronic-kidney-disease

http://rnao.ca/bpg/guidelines/strategies-support-selfmanagement-chronic-conditions-collaboration-clients

References

Centers for Disease Control and Prevention. (2011). Sorting through the evidence for the arthritis self-management program and the chronic disease self-management program: Executive summary of ASMP/CDSMO meta-analysis. retrieved from:

http://www.cdpac.ca/media.php?mid=1208


**Other resources supporting practice recommendations**


Advance Care Planning, Conservative Management, and Palliative Care

Advance Care Planning

Advance care planning is a process that enables patients with decisional capacity to express their wishes about future health care in consultation with their health care providers, family members, and other important people in their lives (Dunbrack, 2006). The process may involve discussion, knowledge sharing, and informed decision making around future and potential end-of-life treatment options and preferences. The primary goal of advance care planning is to seek consensus on care plans that reflect the values and preferences of the patient.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses readiness to participate in discussions about advance care planning and end-of-life care and introduces concepts of advance care planning as early in the course of kidney disease as possible.

Promotes informed decision making regarding treatment options and care for kidney disease including, but not limited to:

- providing information and education about treatment options for kidney disease;
- assisting the patient and family to understand information they receive about treatment options for kidney disease;
- clarifying questions and concerns;
- assessing for symptoms of depression and stages of the grieving process; and
- involving appropriate health team members in discussions about advance care planning.

Assesses patient and family current knowledge level, identified learning needs, and current preparations around advance care planning including, but not limited to:

- values and beliefs about death and dying;
- religious considerations;
- cultural considerations;
- living will (proxy decision making documents);
- will;
- enduring power of attorney;
- resuscitation; and
- funeral arrangements.
Regularly reviews health status, treatments for kidney disease, and progress, and ensures informed decision making regarding ongoing care.

Promotes and respects patient autonomy regarding treatment choices and care for kidney disease, including the right to change decisions regarding dialysis therapy and other care parameters.

Conservative Management

Conservative management is caring for a patient who chooses not to start dialysis as their kidney function worsens. The goals of conservative management should center around living well without dialysis, keeping the patient as comfortable as possible and assisting the patient in achieving a good quality of life. Conservative management can bridge a patient to palliative care as it can take months to years for a patient to arrive at end of life. When symptom burden becomes too much patients care is often taken over by a specialized palliative team that assists in transition from living at home to being in hospice if symptoms are significant and difficult to manage in the home setting.

Palliative Care

Palliative care is “an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual” (World Health Organization, 2002). Palliative care should be considered early in the course of illness, in conjunction with other therapies that are intended to prolong life, and includes those investigations needed to better understand and manage distressing clinical complications (World Health Organization, 2002)

Patients with chronic kidney disease may decline renal replacement therapy, withdraw from dialysis or approach death while still receiving renal replacement therapy. Quality of life and dignity at the end of life are vital for individuals living with kidney disease. In fulfilling these goals, nephrology nurses focus on preventing and relieving suffering through the management of symptoms that result in discomfort. Palliative care may be offered in conjunction with other forms of appropriate medical treatment.

Nephrology nurses spend significant time with patients and their families over the course of their kidney disease and treatment. They are actively involved in providing education and discussions that help to promote decision making about treatment options and ongoing care for individuals with kidney disease. Decisional conflict occurs frequently as our patients struggle with decision to not initiate dialysis or stop dialysis. This wavering can cause emotional distress to the patients and families and can affect the staff as well.
Using the best available evidence and incorporating best evidence informed guidelines, the nephrology nurse:

Assesses the palliative care needs of the patient and family throughout the continuum of kidney disease including, but not limited to:

- exploring understanding of illness trajectory and prognosis;
- identifying learning needs to promote informed decision making about renal replacement therapies and declining dialysis treatments;
- ensuring that the patient and family understand that a choice of “no dialysis” does not mean withdrawal of active treatment for managing symptoms or promoting quality of life;
- assessing for symptoms of depression and/or stages of the grieving process;
- exploring fears and concerns regarding kidney disease, treatments, and perceived prognosis;
- promoting advance care planning;
- assessing patient and family expectations and wishes for continuing and end of life care; and
- respecting the patient’s decisions regarding treatment options and right to revise their decisions and initiate renal replacement therapy at any time.

Develops a plan in collaboration with the patient and family that addresses individual and family priorities for care including, but not limited to:

- physical needs;
- psychosocial needs;
- spiritual needs;
- communication needs and expectations;
- environmental needs; and
- any other identified needs.

Assesses the patient for signs and symptoms of discomfort including, but not limited to those related to:

- integumentary system (i.e. pruritus, edema, skin breakdown, dehydration);
- gastrointestinal system (e.g., nausea, vomiting, constipation, diarrhea);
- respiratory system (e.g., dyspnea, cough, congestion);
- neurological system (e.g., neuropathy, seizures, myoclonus, restless legs);
- cognitive system (e.g., agitation, confusion, depression, delirium); and
- other common symptoms related to kidney disease (e.g., fatigue, cramps, pain, sleep disturbance).

Implements strategies to optimize comfort and quality of life.
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Initiates referral to palliative care or hospice in collaboration with the individual and/or family living with kidney disease.

Links to clinical resources:

National Advance Care Planning Website.
http://www.advancecareplanning.ca/

End of Life Care During the Last Days and Hours. RNAO Clinical Best Practice Guideline (2011).
http://rnao.ca/sites/rnao-ca/files/End-of-Life_Care_During_the_Last_Days_and_Hours_0.pdf

Decision Support for Adults Living with Chronic Kidney Disease: Registered Nurses of Ontario (RNAO) Nursing Best Practice Guideline (2009).
http://rnao.ca/bpg/guidelines/decision-support-adults-living-chronic-kidney-disease

References


Other resources supporting practice recommendations


Blood Pressure

Hypertension is a leading cause of kidney disease in Canada (Kidney Foundation of Canada, 2006). Controlling hypertension reduces overall risk for cardiovascular disease (KDOQI, 2004). Ideal blood pressure control is associated with decreased progression of kidney disease (KDOQI, 2004). The Canadian Hypertension Education Program (CHEP) (2013) and Registered Nurses Association of Ontario Nursing Best Practice Guidelines (2005) provide detailed evidence based guidelines for managing hypertension. Much of the evidence for blood pressure management comes from research carried out with the general population. The optimal blood pressure targets for patients with chronic kidney disease stage 5 receiving hemodialysis are unknown and widely accepted guidelines for other populations are difficult to relate to the dialysis population, therefore, these practice recommendations should not be generalized to the dialysis patient population (Wheeler & Becker, 2013; Davenport, Cox, & Thuraisingham, 2008; Luther & Golper, 2008; Jindal et al., 2006). Nephrology nurses are instrumental in assessing, detecting, monitoring, treating, and evaluating patients for and with hypertension in Canada.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses the blood pressure of patients with kidney disease to detect and monitor for hypertension.

Assesses modifiable lifestyle risk factors for hypertension including:

- poor dietary habits (i.e. dietary sodium);
- abdominal obesity;
- physical inactivity;
- dysglycemia;
- tobacco smoking;
- stress;
- alcohol consumption; and
- nonadherence.

Supports antihypertensive medication management by:

- assessing current medication history, regimens, successes, and challenges;
- assisting the patient to simplify medication regimens where possible;
- maintaining knowledge about the classes of medications that may be prescribed for hypertension management; and
- providing education, in collaboration with authorized prescribers and pharmacists, about the pharmacological management of hypertension.
Develops a plan in collaboration with the patient to address modifiable lifestyle risk factors, including:

- encouraging self-management strategies such as home blood pressure monitoring to promote greater patient understanding, responsibility, and improved outcomes;
- providing instruction on proper blood pressure measurement technique as outlined in CHEP guidelines (2013);
- referring to a registered dietitian as necessary; and
- educating patients about the potential to decrease and slow kidney disease progression and reduce risk from cardiovascular complications by achieving target blood pressure.

Supports patients in the management of hypertension including:

- developing strategies in collaboration with patients to improve modifiable cardiovascular risk factors;
- educating patients about antihypertensive medications;
- educating patients about goals and targets for blood pressure management and benefits of achieving these goals and targets; and
- educating patients on how to identify edema or fluid retention.

Evaluates patient’s ability to achieve blood pressure targets by:

- assessing blood pressure at each visit;
- reviewing medication history and regimen; and
- modifying plan of care in collaboration with the patient to achieve blood pressure targets.

Links to clinical resources

Canadian Hypertension Education Program Recommendations (2013).


http://kdigo.org/home/guidelines/blood-pressure-in-ckd/
KDOQI US Commentary on the 2012 KDIGO Clinical Practice Guideline for Management of Blood Pressure in CKD.
http://download.journals.elsevierhealth.com/pdfs/journals/0272-6386/PIIS027263861300680X.pdf

References


Other resources supporting practice recommendations


Anemia

Anemia is a common complication of kidney disease that starts in the early stages of kidney disease and is associated with decreased quality of life (Dutka, 2012; KDOQI, 2006). While cause and effect relationships have not been clearly defined, treating anemia and raising hemoglobin levels in patients with kidney disease has been associated with improved quality of life, improved muscle strength, and decreased transfusion requirements, hospitalization, and mortality (Nurko, 2006). Nephrology nurses play an active role in assessing, teaching, planning, monitoring, and evaluating anemia in patients with kidney disease.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses patients with kidney disease for signs and symptoms of anemia, including:

- decreased energy and activity levels;
- decreased exercise capacity;
- increased shortness of breath;
- sleep disturbance;
- depression;
- decreased hemoglobin; and
- decreased iron stores.

Assesses patients with kidney disease for possible causes of anemia including:

- blood loss;
- iron deficiency;
- erythropoietin deficiency;
- vitamin deficiencies;
- uremia/inadequate dialysis;
- secondary hyperparathyroidism;
- inflammation/infection;
- malnutrition;
- hypothyroidism;
- lesion/malignancy; and
- heavy metal or aluminum toxicity.

Assesses current patient and knowledge level, self-management abilities, and anemia management strategies, including:

- understanding of anemia associated with kidney disease;
- understanding of treatments for anemia associated with kidney disease;
current medication history including vitamins, iron supplements, and erythropoietic stimulating agents; and

patient ability to administer erythropoietic stimulating agents.

Develops a plan in collaboration with the patient and health care team to achieve anemia targets and improve functional ability for patients with kidney disease:

- educates the patient about signs, symptoms and consequences of anemia associated with kidney disease;
- educates the patient about medication management (vitamins, iron, erythropoietic stimulating agents) for anemia including benefits, side effects, strategies to reduce side effects, and signs and symptoms to report to health care professionals; and
- reinforces importance of adherence to anemia treatments.

Monitors and evaluates patient response to anemia therapy:

- monitors for improvement in signs and symptoms of anemia;
- monitors hemoglobin and iron stores regularly;
- assesses on an ongoing basis possible causes for inadequate response to therapy;
- assesses on an ongoing basis for possible side-effects and/or complications associated with therapy; and
- modifies plan of care in collaboration with the patient and health care team to achieve anemia targets.

Links to clinical resources

https://www.csnsn.ca/committees/clinical-practice-guidelines/library

http://kdigo.org/home/guidelines/anemia-in-ckd/

References


Other resources supporting practice recommendations


CKD Mineral and Bone Disorders

Decreasing renal function affects homeostasis of the mineral metabolism cycle. Additionally, the inability of the body to activate vitamin D occurring in CKD influences the absorption of calcium from the digestive tract. The resulting imbalance of calcium and phosphorus is believed to contribute to renal osteodystrophy, secondary hyperparathyroidism, and soft tissue and vascular calcification (Uhlig et al., 2009; NKF KDOQI, 2003). These long term complications influence/morbidity and mortality of the CKD patient (Uhlig et al., 2009). Renal replacement therapy is only partially effective at treating mineral metabolism and further management is required with nursing care and support.

Nephrology nurses play an active role in assessing, teaching, planning, monitoring, and evaluating bone and mineral metabolism in patients with CKD.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses patients for risk factors associated with CKD mineral and bone disorders including:

- cardiovascular risk factors (see pages 43-45);
- GFR approaching 30 mL/min or less;
- older age;
- history of fracture;
- immobility;
- risk of falls;
- use of glucocorticoids;
- abnormal serum calcium, phosphate, PTH, total alkaline phosphatase levels;
- malnutrition and/or malabsorption; and
- delayed growth in children.

Assesses patients with kidney disease for signs and symptoms of CKD mineral and bone disorders including:

- serum phosphorus, calcium, albumin, parathyroid hormone level;
- pruritus;
- bone and joint pain and swelling;
- tissue erosion (calcific uremic arteriolopathy); and
- eye irritation and inflammation.

Assesses patient and family identified learning needs related to CKD mineral and
bone disorders including, but not limited to:

- complications related to CKD mineral and bone disorder (i.e., bone disease, secondary hyperparathyroidism, cardiovascular disease, soft tissue calcification);
- importance of diet, exercise, and medications to manage CKD mineral and bone disorder; and
- signs and symptoms to report (i.e. pruritis, bone pain, skin lesions/lumps/bumps, eye irritation).

Assesses current treatment plan for CKD mineral and bone disorders including patient self management skills, knowledge, and ability to carry out this plan including, but not limited to:

- diet;
- phosphate binders;
- vitamin D and analogs;
- calcimimetics;
- side effects (i.e. gastrointestinal upset, constipation, unpalatable);
- timing of medications for CKD mineral and bone disorder in relation to meals and other medications that may affect absorption or effectiveness; and
- dialysis adequacy.

Develops and initiates a plan, in collaboration with the patient and family, to achieve desired targets and outcomes related to CKD mineral and bone disorders including, but not limited to:

- referral to registered dietitian for diet counseling;
- reinforcement of diet instruction and restrictions;
- administration and monitoring of medications to control CKD mineral and bone disorder;
- assisting patient in mastery of skills for self management;
- simplifying medication regimen where possible;
- referral to other health professionals as necessary (social worker; physiotherapy);
- exploration of perceived barriers to achieving targets and outcomes (i.e. financial, complexity of plan; side effects); and
- evaluation of outcomes in collaboration with the patient and revises the plan of care when necessary.

Monitors and evaluates patient response to CKD mineral and bone disorder therapy including, but not limited to:

- monitoring for improvement in signs and symptoms related to CKD mineral and bone disorder;
- monitoring serum calcium, phosphorus, albumin, and parathyroid hormone levels.
regularly;
• assessing, on an ongoing basis, possible causes for inadequate response to therapy;
• assessing, on an ongoing basis, for possible side-effects and/or complications of therapy; and
• modifying the plan of care in collaboration with the patient and health care team to achieve targets.

Links to clinical resources

http://kdigo.org/home/mineral-bone-disorder/

http://download.journals.elsevierhealth.com/pdfs/journals/0272-6386/PIIS0272638610004877

K/DOQI Clinical Practice Guidelines for Bone Metabolism and Disease in Chronic Kidney Disease.
http://www2.kidney.org/professionals/KDOQI/guidelines_bone/

References


Other resources supporting practice recommendations


Treatment with dietary intervention is one of the most important aspects of managing kidney disease. Dietary restrictions are almost always necessary to maintain metabolic homeostasis, but must be balanced to avoid malnutrition. Many patients with kidney disease are malnourished and it is known that patients with hypoalbuminuria tend to do poorly on dialysis and have higher mortality rates (National Kidney Foundation, 2005).

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses nutritional status and barriers to achieving nutritional and dietary requirements, identified by the dietitian, to determine nutritional and resource needs including, but not limited to:

- weight, height, and BMI (adult);
- weight/height index (pediatric);
- head circumference (age 3 years and under);
- edema;
- serum urea, creatinine, albumin, phosphorus, calcium, lipid profile, glucose profile, bicarbonate, sodium, potassium, and magnesium;
- metabolic acidosis;
- anemia;
- current dietary habits, restrictions, food preferences, and cultural considerations;
- advancement for infants from liquid to solids (pediatric);
- ability to obtain and prepare food including mixing special formulas for infants;
- ability to chew and swallow;
- affordability;
- gastrointestinal disturbance;
- other illnesses requiring special dietary consideration;
- allergies;
- level of kidney disease;
- dialysis modality and adequacy;
- medication history; and
- need for vitamin and mineral supplements.

Assesses current knowledge level and patient/parent or caregiver identified learning needs about nutritional requirements and dietary restrictions, initiates referral to dietitian for nutrition intervention and counseling, and implements a plan in collaboration with the patient including, but not limited to, providing education and information regarding:
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- diet, nutrition, and health considerations;
- reinforcement of registered dietitian’s counseling and prescription;
- healthy choices and alternatives;
- blood work results as they relate to dietary therapy;
- tools and strategies to understand and manage fluid and hydration;
- need for vitamin and mineral supplements as necessary (e.g., multivitamins, folic acid, iron, sodium bicarbonate);
- phosphorus allowance;
- calcium requirements;
- potassium allowance;
- sodium reduction and allowance;
- protein requirements;
- importance and impact of protein in kidney disease and need for dietitian consult if restrictions are required;
- appropriate considerations related to level of kidney disease, dialysis modality, individual needs, and growth and development;
- avoiding herbal products that may have nephrotoxic effects;
- importance of adhering to dietary recommendations/restrictions for protein and sodium (if applicable) in an effort to delay the progression of kidney disease; and
- potential consequences of and complications related to hyperkalemia, mineral metabolism disturbances, and excessive sodium and water intake.

Monitors and evaluates patient response to nutrition and diet therapy:

- monitors for improved nutritional markers including height and weight;
- monitors albumin, serum urea, calcium, phosphorus, glucose, bicarbonate, hemoglobin, and iron stores regularly;
- assesses on an ongoing basis for possible causes for inadequate response to nutrition and diet therapy; and
- modifies plan of care in collaboration with the patient, family, dietitian and other members of the health care team to achieve nutrition and dietary targets.

Links to clinical resources


References


Other resources supporting practice recommendations


Diabetes

Diabetes is the leading cause of End Stage Renal Disease in Canada; in 2011, 35% of new patients with ESRD had a primary diagnosis of diabetes and the majority of these patients are over the age of 65 (CIHI, 2013). Obesity is one of the major contributing factors to the increase in type 2 diabetes rates and its complications (Public Health Agency of Canada, 2011). Diabetes rates in Aboriginal Canadians with end stage renal disease are almost twice as high non-Aboriginal patients (CIHI, 2013). Also, aboriginal patients are a decade younger and are more likely to be obese (40% versus 27%) than their non-Aboriginal counterparts (CIHI, 2013). There are also strong links to the rate of diabetes related end stage renal disease and socioeconomic status (Ward, 2009). The five-year survival rate for patients on dialysis is the lowest at 40% for those having a primary diagnosis of diabetes (CIHI, 2013).

In general, patients with diabetes are at greater risk for progression and, in particular, rapid progression of kidney disease than patients without diabetes. There is evidence that early interventions such as glycemic control, optimization of blood pressure, and use of medications to disrupt the renin-angiotnesin-aldosterone system can delay the progression of kidney disease and delay the onset of dialysis (Canadian Diabetes Association (CDA), 2013; Cavanaugh, 2007; Stripolli, Craig, & Craig, 2005; KDIGO, 2012). In line with the principles of chronic disease management, patients are to be considered essential and central members of the multidisciplinary team. They need to be provided with the necessary tools, education and support to self-manage their condition (Perfetti, 2013).

Nephrology nurses play an important role in assessing, monitoring, educating, and counseling patients with CKD where interventions to delay progression of kidney disease can be implemented and evaluated. Optimal management of diabetes throughout all stages of kidney disease is important for the reduction of risk associated with cardiovascular disease. The incidence of diabetic foot ulcers leading to complications and amputations is high in the kidney disease population with diabetes; people with diabetes receiving hemodialysis are at greatest risk (Broersma, 2004; Locking-Cusolito et al., 2004).

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses patient current knowledge level and patient identified learning needs including, but not limited to:

- understanding and perception of relationship of diabetes to kidney disease and that kidney disease is a classically “silent” disease;
- understanding of the importance of optimal blood glucose control and blood pressure control on delaying progression of kidney disease;
understanding and appropriate management of diet;
understanding and discerning the role of medications particularly Angiotensin Converting Enzyme Inhibitors /Angiotensin Receptor Blockers in delaying progression of kidney disease within well defined parameters;
understanding the patient’s role in self management to achieve optimal targets;
understanding the risks associated with some diabetes medications at varying levels of kidney function; and
understanding of increased risk for cardiovascular disease.

Assesses diabetes medication management including but not limited to:

- current medication history and regimens
- considers level of kidney function as a key variable in dose adjustment and medication appropriateness.
- successes and challenges with medication management;
- side effects of medications
- reports hypoglycemic episodes to multidisciplinary team members;

Assists patients to simplify medication regimens where possible; and educates patients about prescribed medications to manage diabetes, slow progression of kidney disease, and lower cardiovascular disease risk.

Assesses management of dyslipidemia in diabetes and CKD including but not limited to:

- educates patients about dyslipidemia being common in people with diabetes and CKD; and
- assesses use of dyslipidemia medication therapies and their side effects (i.e. myopathy).

Assesses blood glucose management in patients with diabetes and CKD including but not limited to:

- ability to achieve glycemic control targets while avoiding hypoglycemia.
  - Hb A1C,
  - self- monitoring of blood glucose results as per best practice guidelines;
- psychological, physical, and financial barriers that may prohibit recommended self-monitoring of blood glucose levels;
- ensuring glycemic control is part of a multifactorial intervention strategy addressing cardiovascular risk factors;
- availability and current use of community resources to help manage diabetes; and
- exploring the impact of cultural practices and beliefs on adaptation to diabetes and self management practices.
Assesses modifiable lifestyle risk factors that contribute to diabetes and progression of diabetic kidney disease and management including but not limited to:

- obesity;
- hypertension;
- dysglycemia;
- physical inactivity;
- unhealthy food choices;
- tobacco smoking;
- alcohol consumption; and
- nonadherence.

Assesses patients with kidney disease and diabetes for foot complications such as neuropathy, vascular disease, and foot ulceration including but not limited to:

- inspects feet for structural abnormalities and foot calluses and ulcers; palpates pedal pulses and tests for loss of sensation with 10-g monofilament (CDA, 2013);
- completes risk assessment for complications (history of previous foot ulcers, impaired sensation, poor circulation; evidence of infection, self management behavior and knowledge. Risk assessment facilitates targeting high risk patients and tailoring education to their needs (Daly et al., 2013)
- foot examinations should be performed annually for patients without neuropathy, every 6 months for patients with neuropathy and no deformity, and every 3 months for patients with a history of deformity and/or vascular disease, and every 1-3 months for patients with a history of ulceration (Peters & Lavery, 2001);
- provides foot care education including: importance of daily inspection, proper nail and skin care, proper footwear, counseling to avoid foot trauma, smoking cessation and seeking prompt attention if problems occur; and smoking cessation;
- assesses for neuropathic pain;
- coordinates referral for patients with foot ulcers to a health care professional with expertise in diabetes foot care; and
- recognizes that any infection must be treated aggressively.

Using best evidence informed guidelines, identifies, promotes and provides information about screening that aids in prevention, onset and delay in progression of early nephropathy and complications including:

- best possible glycemic control and adequate diabetes management;
- screening for proteinuria such as persistent albuminuria, considered to be earliest clinical sign of diabetic nephropathy (CDA, 2013);
- serum creatinine levels, creatinine clearance, and estimated glomerular filtration rate;
- monitoring of effectiveness and possible side effects and complications of medications to reduce proteinuria and prevent progression of nephropathy (i.e. cough,
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hyperkalemia, rise in creatinine with ACE inhibitors);
- blood pressure management (see pages 25-27); and
- importance of evaluating retinopathy by an experienced professional.

Develops and initiates a treatment plan in collaboration with the patient to manage diabetes risk factors associated with kidney disease and cardiovascular disease. The plan includes, but is not limited to:

- provides education regarding diabetes and kidney disease based on knowledge deficiencies and patient identified learning needs;
- promotes self-management as an integral strategy for achieving targets and goals;
- promotes patient goal setting for health behaviors;
- provides diet instruction and refer to dietitian as necessary;
- educates patients about goals and targets for diabetes management;
- assists patients in the mastery of self-management strategies (for example blood glucose and blood pressure self monitoring, log keeping, management of high and low blood glucose levels, when to seek help); and
- utilizes/refers to community based programs (cardiac rehabilitation, nutrition classes, exercise programs, etc.).

Links to clinical resources

Canadian Diabetes Association Clinic Practice Guidelines (2013).
http://guidelines.diabetes.ca/

Assessment and Management of Foot Ulcers for People With Diabetes. RNAO Nursing Best Practice Guideline (2013).

http://rnao.ca/bpg/guidelines/reducing-foot-complications-people-diabetes

Note: See section on Blood Pressure for links to blood pressure clinical resources

References


Other resources supporting practice recommendations


Cardiovascular Risk Factors

CKD is an independent risk factor for cardiovascular disease and cardiovascular disease is the leading cause of death for patients with kidney disease (Agarwal, 2007). Dyslipidemia is highly prevalent in this population and may be indicated in the progression of CKD (Agarwal, 2007). The incidence of cardiovascular disease is higher in the kidney disease population than in the general population and even higher in the kidney disease population with diabetes. Treatment and control of cardiovascular disease risk factors, both traditional and non-traditional are of primary importance for patients with kidney disease (Gansevoort, Correa-Rotter, Hemmelgarn, Jafar, Heerspink, Mann, Matsushita, & Pang; 2013).

There is evidence to support the use of statins and dyslipidemia targets in early stages of chronic kidney disease to reduce cardiovascular risk, (McMurray, 2005; Shurraw & Tonelli, 2007). However, there is a paucity of evidence regarding treatments to reduce cardiovascular risk in patients on dialysis and those with advanced chronic kidney disease (Agarwal, 2007). These recommendations cannot be generalized to the dialysis population and those patients with advanced chronic kidney disease, therefore program specific recommendations should be followed.

Nephrology nurses are important partners with other health care providers and patients to assist in the assessment, education, treatment, monitoring, and evaluation of cardiovascular risk factors for patients with kidney disease.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses and promotes evidence informed lifestyle modification aimed at reducing cardiovascular disease including but not limited to:

- unhealthy food choices;
- hypertension;
- physical inactivity;
- dysglycemia;
- alcohol consumption;
- tobacco smoking;
- stress and mental health issues; and
- nonadherence.

Considers non-traditional cardiovascular risk factors associated with kidney disease including but not limited to:

- anemia;
- excess fluid volume; and
- hyperparathyroidism.
Assesses cardiovascular medication management

- assesses current medication history and regimens;
- assesses successes and challenges with medication management; and
- assesses for side effects of medications.

Develops a plan, in collaboration with the patient, to address risk factors associated with cardiovascular disease including, but not limited to:

- encourages self-management strategies including home blood pressure monitoring to promote greater patient understanding and responsibility, and improve outcomes;
- provides diet instruction and refers to registered dietitian as necessary;
- assists patients to simplify medication regimens where possible;
- promotes smoking cessation, healthy lifestyle choices, and maintaining healthy weight; and
- utilizes/refers patient to community-based programs (e.g., cardiac rehabilitation, nutrition classes, exercise programs).

Provides information to patients on the management of cardiovascular disease risk factors including, but not limited to:

- educates patients about goals and targets for cardiovascular disease risk factors;
- educates patients about prescribed medications to manage/lower cardiovascular disease risk;
- assists patients in the development of self-management strategies (e.g., home blood pressure monitoring, diaries, logs); and
- assists patient to master skills for self management.

Monitors and evaluates patient response to interventions to reduce cardiovascular disease risk factors including, but not limited to:

- assesses on an ongoing basis possible causes and barriers to achieving targets for cardiovascular disease risk reduction;
- assesses for possible side-effects and/or complications of therapy;
- monitors for improved and/or stabilized signs and symptoms related to cardiovascular disease;
- monitors improvement in lifestyle modification behaviors to reduce cardiovascular disease risk factors; and
- modifies plan of care in collaboration with the patient and health care team to cardiovascular disease risk reduction targets.
Links to clinical resources

Update of the Canadian Cardiovascular Society Guidelines for the Diagnosis and Treatment of Dyslipidemia for the Prevention of Cardiovascular Disease in the Adult (2012).
http://dyslipidemia.onlinecjc.ca/Content/PDFs/2012Guidelines.pdf

References


Other resources supporting practice recommendations


CHRONIC KIDNEY DISEASE STAGES 1-5 (not on dialysis)
The incidence of chronic kidney disease is increasing as our population ages and major factors such as diabetes and obesity increase (Jha, Garcia-Garcia, Iseki, et al. 2013; James, Hemmelgarn, & Tonelli, 2010). It is estimated that 3.6 million Canadians have CKD challenging both health care decision making and health care resources (James, Hemmelgarn & Tonelli, 2010). The groups at greatest risk for developing CKD include elderly people and those with concomitant illness such as diabetes, hypertension, or cardiovascular disease, or those with a family history of CKD (James, Hemmelgarn, & Tonelli, 2010). The increased incidence of CKD has resulted in an increased focus on predialysis care in the adult population with the goal of delaying the progression of CKD. Patient and family education regarding appropriate CKD management includes options for care, and if necessary, preparation for renal replacement therapy (McCarley, & Burrows-Hudson, 2006). Early chronic kidney disease management can lead to effective planning and appropriate timing of dialysis start and access creation.

The focus of care for pediatric patients emphasizes primary prevention, early detection, and aggressive management (Warady & Chadha, 2007). The renal replacement therapy of choice for the pediatric population is transplantation; preferably pre-emptive renal transplantation with a living donor when available (Warady & Chadha, 2007).

It is recognized that a multidisciplinary approach to CKD care is preferable and has demonstrated advantages for patients that include a survival advantage, as well as a cost benefit to the health care system (Hemmelgarn, et al., 2007). Risk factors associated with CKD progression include cause of CKD, level of glomerular filtration rate (GFR), level of albuminuria, age, sex, race/ethnicity, elevated blood pressure, hyperglycemia, dyslipidemia, smoking, obesity, history of cardiovascular disease, and ongoing exposure to nephrotoxins (KDIGO, 2012). The cornerstone of chronic kidney disease management lies in the treatment of the modifiable risk factors such as control of blood pressure, management of cardiovascular disease risk factors, interruption of the renin-angiotensin system, glucose control, and smoking cessation (Levin & Mendelssohn, 2006).

Nephrology nurses are instrumental in the coordination and delivery of this care. Integral to this care is a self-management approach that keeps patients at the forefront, working in collaboration with the healthcare team. Health promotion and disease management are fundamental to patients at CKD stages 1-5 (not on dialysis). The nephrology nurse plays an integral role in assessing, coordinating care, providing education and interventions and follow up of this patient population.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assessment of Renal Function and Chronic Kidney Disease Progression

Assesses renal function and progression of chronic kidney disease including but not limited to:

- height at initial visit for adults and each visit for pediatric patients;
Modifiable Lifestyle Risk Factors

Assesses modifiable risk factors associated with lifestyle that contribute to chronic kidney disease while engaging the client to be active in learning and goal setting to modify risk factors:

- hypertension;
- diet;
- smoking;
- alcohol use;
- exercise; and
- stress.

Patient Education

Uses a learner centred approach to education that will assist patients to become active in and build their confidence to manage their own health including but not limited to:

- functions of the kidney;
- chronic kidney disease, stages, signs and symptoms;
- common causes of chronic kidney disease;
- nutrition and chronic kidney disease;
- psychosocial and lifestyle issues associated with chronic illness;
- role of medications in CKD management including medications to avoid and education about medication management;
- modifiable lifestyle factors, and their role in ability to slow progression;
- living healthy with chronic kidney disease;
- options for care, including all forms of dialysis, transplantation, conservative and palliative therapy;
- management of chronic kidney disease when dialysis is declined or not appropriate; and
- advance directives.

Engages the patient to participate in a collaborative plan of action, which is goal specific and includes principles of self-management in order to meet their needs:

- provides information about chronic kidney disease care delivery setting and other
relevant health care service information;

- provides education about chronic kidney disease and chronic kidney disease management using a variety of methods and tools (1:1 teaching, class opportunities, peer support, reading, visual);
- provides information about patient level of kidney function, risk factors, and self management strategies to engage the patient in actively participating in care;
- provides education about renal replacement therapy options;
- provides education about access creation and coordinates consults related to access planning and creation;
- provides education about managing chronic kidney disease when dialysis is declined or inappropriate and explores patient feelings around this issue;
- provides information about advance directives and resources available for developing an advance directive;
- promotes self management abilities and strategies to promote health;
- provides information and support to enable patients to master skills for self management; and
- provides instruction, organizes programs, and/or refers patients to health promotion classes (e.g., smoking cessation, dyslipidemia, exercise, blood pressure management, stress management, symptom management technique).

**Links to clinical resources**

KDIGO Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease (2102)

Canadian Hypertension Education Program Recommendations (2013)

Facilitating Client Centred learning: Clinical Best Practice Guidelines, Registered Nurses’ Association of Ontario (2012)

[http://rnao.ca/bpg/guidelines/strategies-support-selfmanagement-chronic-conditions-collaboration-clients](http://rnao.ca/bpg/guidelines/strategies-support-selfmanagement-chronic-conditions-collaboration-clients)

**References**


**Other resources supporting practice recommendations**


ACUTE KIDNEY INJURY

Acute kidney injury (AKI) is characterized by a loss of kidney function that can occur over a number of hours to days (Murphy & Byrne, 2010). AKI leads to a rise in serum creatinine and/or a reduction in urine output (Ali & Gray-Vickery, 2011; Yaklin, 2011). The severity of renal dysfunction may be mild, requiring little intervention, to severe, necessitating renal replacement therapy. Although AKI is potentially reversible, the mortality rate is high (Williams, Bogle, & Davey-Tresemer, 2008; Dirkes, 2011; Yaklin, 2011).

Causes of AKI may be pre-renal, intra-renal, or post renal in nature. Pre-renal AKI results from diminished renal perfusion, and accounts for about 70% of AKI cases. Insults that lead to hypovolemia, decreased cardiac output, decreased peripheral vascular resistance are all pre-renal causes of AKI (Murphy & Byrne, 2010). Acute tubular necrosis accounts for the majority of cases of intra-renal AKI, often as a result of exposure to nephrotoxic agents or renal ischemia, sepsis, or exposure to nephrotoxic agents. Post renal causes are least common, and are related to obstruction of urine flow anywhere in the urinary tract.

Understanding the factors involved in AKI allows the nephrology nurse the potential to identify, intervene earlier, and possibly prevent serious complications from AKI in patients who are at risk (Yaklin, 2011). The nephrology nurse plays an integral role in risk factor assessment for AKI and supportive therapy of those who develop AKI until the kidney injury heals (Williams, Bogle, & Davey-Tresemer, 2008). The goals of supportive therapy are to maintain homeostasis and prevent life-threatening complications such as infection, fluid/electrolyte imbalance, acid base imbalance and gastrointestinal bleeding (Williams, Bogle, & Davey-Tresemer, 2008). Nephrology nurses must be aware of the phases of acute renal failure which include onset, oliguric, diuretic, and recovery, as goals of care vary during the various phases.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses for common risk factors for developing AKI including but not limited to:

- pre-existing kidney disease (the most important risk factor);
- age greater than 60;
- type 2 diabetes;
- heart disease;
- exposure to nephrotoxins (i.e. radiocontrast dye, and medications that cause intra-renal vasoconstriction such as NSAIDs);
- volume depletion; and
- diagnosis of sepsis.
Assesses for causes of AKI including but not limited to:

- hypovolemia (decreased fluid volume in the intravascular space causing decreased peripheral perfusion);
- hypovolemic shock (i.e. hypovolemia plus hypotension);
- decreased cardiac output;
- liver failure;
- infection;
- nephrotoxins;
- drug intoxication/overdose (i.e. salicylates, ethylene glycol, methanol, lithium); and
- urinary obstruction.

Assesses patients for the following parameters, including but not limited to:

- vital signs;
- skin integrity;
- nutritional status;
- knowledge needs of patient and family; and
- coping and support systems.

Monitors and evaluates patient response to therapy including but not limited to:

- serum electrolytes, blood urea nitrogen, creatinine;
- fluid volume status (i.e. intake and output, edema, pulmonary edema, weight, central venous pressure);
- vital signs;
- monitors for improvement in symptoms; and
- modifies plan of care in collaboration with the patient and health care team to achieve desired outcomes.

Assesses and monitors for progression through acute renal failure stages including but not limited to:

Onset

- mild reduction in normal daily urine output;
- mild lethargy; and
- mild malaise.

Oliguric/Anuric Phase:

- 24 hour urine total 400 ml or less;
electrolyte imbalances (i.e. hyperkalemia, hyperphosphotemia, hypocalcemia, metabolic acidosis);
- listlessness/fatigue;
- confusion or altered LOC related to electrolyte imbalances;
- fever;
- crackles upon lung auscultation (due to fluid overload);
- shortness of breath (due to fluid overload);
- jugular vein distention (due to fluid overload);
- periorbital, peripheral or sacral edema (due to fluid overload);
- ascites (due to fluid overload);
- capillary fragility as evidenced by easy bruising; and
- anorexia, nausea, vomiting, diarrhea, constipation.

Diuretic Phase:

- urine output of 3 to 5 liters in a 24 hour period;
- lethargy or muscle weakness (due to hypokalemia);
- decreased blood pressure (due to fluid depletion);
- dry mucous membranes (due to fluid depletion); and
- poor skin turgor and delayed capillary refill (due to fluid depletion).

Recovery Phase:

- urine output of 1500 to 1800 ml in a 24 hour period;
- stabilization of serum potassium, bicarbonate, BUN and creatinine;
- reduction in lethargy and shortness of breath; and
- reduction in adventitious breath sounds.

Provides renal replacement therapy in keeping with program guidelines.

Links to clinical resources:

KDIGO Acute Kidney Injury (2012)

References

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**Other resources supporting practice recommendations**


RENNAL REPLACEMENT THERAPIES

Hemodialysis

Hemodialysis is a common renal replacement therapy offered in hospital based units, freestanding units not in hospitals, or as a self care home modality. Prescriptions and methods for hemodialysis vary depending on the individual.

Hemodialysis Vascular Access

Despite technological advances and strengths in hemodialysis programs, the key to successful hemodialysis remains the ability to establish good vascular access. The arteriovenous fistula is the gold standard for access related to its decreased complication rate (Thomas, 2005; Wilson, Harwood, Oudshoorn, 2013). Only when an arteriovenous fistula is not able to be created should a synthetic graft, central venous catheter or other vascular access be considered as there is no long term benefit associated with other forms of vascular access. Nephrology nurses are responsible for following infection prevention and control policies and protocols when accessing any type of hemodialysis access. Access is closely linked to adequacy of the treatment (Thomas, 2005). Adequate dialysis decreases morbidity and mortality.

a) Arteriovenous Fistula/Arteriovenous Graft

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses patients for, and promotes arteriovenous fistula as first line long-term hemodialysis access including, but not limited to:

providing education about the benefits of arteriovenous fistulas over other forms of vascular access;
identifying patients for referral for arteriovenous fistulas;
exploring concerns around arteriovenous fistula creation, clarifying misconceptions and developing a plan with the patient to address concerns;
providing arteriovenous fistula candidates with instructions regarding protecting the chosen arteriovenous fistula limb and blood vessels from injury that may compromise creation and development of an arteriovenous fistula; and
providing information about arteriovenous grafts and central venous catheters if an arteriovenous fistula is not an option.

Assesses the arteriovenous fistula/graft and limb after creation and prior to each hemodialysis to determine physical and functional readiness for use including, but not limited to:
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- impaired healing of the incision site over the new arteriovenous fistula/graft;
- swelling;
- redness;
- bleeding/bruising;
- drainage;
- tenderness/ pain;
- aneurysm formation;
- skin irritation;
- maturation
- direction of blood flow in new arteriovenous fistula/graft;
- cyanosis of the finger tips and delayed capillary refill of the nail beds;
- numbness, tingling, pain in extremity;
- presence and quality of bruit and thrill
- temperature for abnormal warmth or coolness; and
- comparative temperature of digits in both access and non-access limbs.

Monitors, records, and reports the access flow of the arteriovenous fistula/graft as per unit guidelines.

Addresses any concerns from the patient regarding arteriovenous fistula/graft access.

Develops, documents, and follows a cannulation plan.

Cannulates arteriovenous fistula/graft in accordance with established unit protocol and using CANNT endorsed clinical educators network nursing recommendations for management of vascular access in hemodialysis patients (Thomas, 2006) as a guideline

Uses appropriate cleaning and infection control techniques when assessing and caring for arteriovenous fistula/graft

Assesses the patients’ arteriovenous fistula/graft for complications during hemodialysis treatment including, but not limited to:

- cannulation difficulties;
- pain;
- bleeding;
- infiltration;
- hematoma;
- blood flow rates;
- arterial/venous pressures outside established parameters; and
- changes in access flow.
Instructs the patient with an arteriovenous fistula/graft to report signs and symptoms suggestive of complications, and seek medical attention for, but not limited to:

- fever;
- chills;
- bleeding;
- drainage;
- absence of/or diminished thrill;
- swelling of access limb;
- skin irritation; and
- numbness, tingling, and/or decreased motor function of the access limb.

Educates the patient about possible complications associated with an arteriovenous fistula/graft including, but not limited to:

- infection;
- thrombosis;
- stenosis;
- bleeding;
- steal syndrome;
- failure of fistula maturation; and
- venipuncture infiltration.

Provides instruction regarding the appropriate cleaning of the arteriovenous fistula/graft.

Educates and instructs patients with an arteriovenous fistula/graft about the care and protection of the access and access limb including, but not limited to:

- checking the thrill/pulse in access daily;
- using the access site only for dialysis;
- protecting from injury such as bumps and cuts;
- avoiding blood pressure checks, injections, and blood drawing in the access limb;
- avoiding sleeping on access limb;
- avoiding tight jewelry or tight clothing is worn over access site; and
- avoiding heavy lifting.

Notifies the appropriate health care provider regarding assessment findings that preclude or alter use of the access and hemodialysis treatment plan.

b) Central Venous Catheter
Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses the patient for complications post insertion of a central venous catheter including, but not limited to:

- airway management and/or respiratory arrest;
- respiratory distress;
- cyanosis;
- bleeding, bruising, or swelling;
- hypotension with tachycardia;
- cardiac arrhythmia;
- catheter and dressing integrity; and
- pain.

Ensures that central venous catheter tip placement is verified after new catheter insertion before proceeding with hemodialysis treatment.

Assesses the patient and central venous catheter access and exit site prior to each treatment including, but not limited to:

- patency;
- redness;
- discharge;
- swelling;
- bruising;
- bleeding;
- tenderness;
- line integrity;
- neck and facial swelling; and
- any concerns from the patient regarding central venous catheter access.

Assesses the patients’ central venous catheter access for complications during hemodialysis treatment including, but not limited to:

- pain;
- bleeding;
- blood flow rates;
- arterial/venous pressures outside established parameters;
- respiratory distress; and
- catheter integrity.

Administers a thrombolytic agent ie. tissue plasminogen activator (tPA) as per unit protocol or physician/appropriate health care provider orders for treatment of
Educates the patient about possible complications associated with hemodialysis central venous catheter access including, but not limited to:

- infection;
- central vein stenosis/thrombosis;
- catheter occlusion/fibrin sheath formation;
- catheter malfunction;
- bleeding;
- air or thromboembolism;
- hemothorax/pneumothorax/cardiac tamponade; and
- vascular erosion, laceration, perforation.

Hemodialysis Adequacy

Assesses the patient on an ongoing basis for signs and symptoms of inadequate hemodialysis including, but not limited to:

- fatigue;
- loss of appetite;
- altered taste
- nausea;
- vomiting;
- pruritis;
- difficulty concentrating;
- weight loss;
- anemia;
- secondary hyperparathyroidism;
- neuropathy;
- restless legs;
- abnormal electrolytes;
- pericarditis;
- changes in cognitive function; and
- poor growth or weight gain in pediatric patients.

Assesses possible causes for hemodialysis delivered dose parameters that are below the minimum acceptable level (i.e. urea clearance < 65% or Kt/V < 1.2) including, but not limited to:

- low pump speeds;
- inadequate dialysate flow for dialyser size;
- recirculation;
- lost hemodialysis time;
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- arteriovenous fistula/graft stenosis;
- error in sampling procedure;
- inappropriate dialyzer size or clearance;
- inadequate dialyzer priming;
- excessive dialyzer clotting; and
- incorrect needle placement.

**Educates and develops a plan in collaboration with the patient to achieve adequate dialysis treatments including, but not limited to:**

- adhering to prescribed hemodialysis treatment time;
- understanding possible consequences and complications related to inadequate hemodialysis;
- maximizing pump speeds;
- minimizing complications such as hypotension and cramps that potentially reduce hemodialysis time;
- appropriate needle size and placement; and
- adherence to dietary and fluid restriction.

**Collects data and participates in quality assurance activities to improve hemodialysis adequacy.**

**Hemodialysis Treatment and Complications**

**Confirms hemodialysis prescription and orders prior to initiating treatment including, but not limited to:**

- dialyzer;
- electrolyte/molecular composition of dialysate;
- frequency and length of treatment;
- blood flow and dialysate flow rate;
- anticoagulation;
- dialysate temperature;
- ultrafiltration profiling;
- sodium profiling; and
- target weight.

**Reviews and assesses the most recent laboratory tests prior to hemodialysis treatment and assesses for conflict with dialysis prescription.**

**Assesses the patient’s health status/health concerns between hemodialysis treatments for other illness and complications that might affect current hemodialysis treatment including, but not limited to:**
dizziness;
weakness;
hypotension;
feeling unwell;
fever;
nausea;
vomiting;
diarrhea;
chest pain;
shortness of breath;
new medications, changes in medication dosing, or discontinued medications;
bleeding;
bruising;
falls; and
medical/surgical treatments or procedures.

Assessment includes:

- symptom onset;
- location/radiation;
- duration;
- intensity/character; and
- aggravating and relieving factors.

Collaborates with appropriate health care provider and the patient to develop and implement a plan of care to improve hemodialysis adequacy.

Completes a focused physical assessment of the patient before, during, and after hemodialysis including, but not limited to:

- weight (pre and post dialysis);
- blood pressure;
- heart rate;
- respiratory rate and quality;
- edema (peripheral, facial, sacral, periorbital, fontanel);
- jugular venous distention;
- level of consciousness and orientation; and
- heart and lung sounds.

Assesses hemodialysis equipment prior to hemodialysis initiation for:
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- disinfection;
- blood pump occlusion;
- functioning alarms;
- integrity of extracorporeal circuit;
- dialysate conductivity; and
- water treatment congruent with unit policy.

Assesses the patient during the hemodialysis treatment to ensure that access is secure (i.e. needles and lines securely taped, access is visible).

Assess the patient during the hemodialysis treatment for complications and responds to unexpected outcomes including, but not limited to:

- hypotension;
- cramping;
- disequilibrium syndrome;
- air embolism;
- hemolysis;
- bleeding/hemorrhage /exsanguination;
- blood leak;
- clotting of circuit;
- cardiac events (e.g., dysrhythmias, angina, uremic pericarditis, cardiac arrest);
- dialyzer reaction;
- pyrogenic reaction;
- infection; and
- monitoring the hemodialysis machine and extracorporeal circuit.

Engages the patient in the hemodialysis treatment and encourage participation and self management when possible.

Collaborates with the patient /parent or caregiver to evaluate the hemodialysis treatment, set treatment goals, and revises the plan of care as necessary for next treatment.

Assesses knowledge needs and develops and implements a plan in collaboration with the patient regarding hemodialysis therapy and associated treatments including, but not limited to:

- diet/fluid;
- anemia;
- bone and mineral metabolism;
- medications; and
- care of access.
Medication Management

Assesses medication regimen and develops a plan with the patient that includes, but is not limited to:

- current medication regimens, successes, and challenges;
- assists the patient to simplify medication regimens;
- administers prescribed medications during the hemodialysis treatment;
- identifies indications and interactions for commonly administered hemodialysis medications (e.g., erythropoiesis stimulating agents, iron preparations, vitamin D sterols, antibiotics, thrombolytic agents);
- completes and documents a medication history as per unit policy and assesses for any dosing changes, new or discontinued medications with each treatment; and
- educates the patient/parent or caregiver about medications, including timing in relation to hemodialysis schedule and assists patient to simplify medication regimen where possible.

Infection Control Practices

Follows unit-based infection control procedures for:

- cleaning and disinfection of equipment and work area between patient appointments;
- handling medications;
- handling and disposal of contaminated supplies;
- adherence to infection and prevention and control measures;
- ensures appropriate isolation techniques;
- vaccinations for influenza and pneumonia as per unit policy;
- tuberculosis if pertinent to patient population;
- screening patients for antibiotic resistant organisms (i.e., Methicillin Resistant Staphylococcus Aureus, Vancomycin Resistant Enterococcus) as per unit policy; and
- follows unit policy for initial testing, vaccination, and follow-up of hepatitis B and C.

Adheres to unit policies related to prevention and transmission of blood-borne pathogens:

- ensures inspection of the internal pressure tubing set and pressure sensing port for possible blood contamination;
- uses an external transducer protector and alarm capabilities as indicated in the manufacturer’s instructions;
- assesses the external transducer protector for wetness. If this becomes wet, it is replaced immediately and inspected. If fluid is visible on the side of the transducer
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protector that faces the machine, ensures qualified personnel should open the machine and check for contamination after the treatment is completed;
• ensures that if contamination has occurred, the machine is taken out of service and disinfected before further use.

Links to clinical resources

http://www.cannt.ca/member_files/Journals/CANNT-16-3-Sup-2006.pdf

http://www.bcrenalagency.ca/node/797

http://www.bcrenalagency.ca/node/791

Hemodialysis Adequacy, Peritoneal Dialysis Adequacy, Vascular Access. KDOQI Clinical Practice Guidelines and Clinical Practice Recommendations
http://www.ajkd.org/issue/S0272-6386(06)X0213-5


CDC Infection Prevention in Dialysis Settings (2012)

http://www.apic.org/Resource_/EliminationGuideForm/7966d850-0c5a-48ae-9090-a1da00bcf988/File/APIC-Hemodialysis.pdf

http://www.chica.org/pdf/hemodialysisHBV.pdf

References

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Other resources supporting practice recommendations

Peritoneal Dialysis

Peritoneal dialysis is an important form of renal replacement therapy for patients with kidney failure (stage 5). It has the advantage of being a home based therapy and there is some evidence that patients receiving this type of dialysis have been more satisfied with their care than patients on hemodialysis (Juergensen, Wuerth, Finkelstein, Juergensen, Bekui, Finkelstein, 2006).

Nephrology nurses play an important role in the coordination, monitoring, counseling and education of patients receiving peritoneal dialysis. In doing so, nephrology nurses focus on the benefits and challenges associated with peritoneal dialysis, the peritoneal dialysis procedure, self management skills, associated potential complications, and health promoting behaviors.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Pre-operative Care

Assesses patient/parent or caregiver ability and supports to perform peritoneal dialysis and potential contraindications for peritoneal dialysis including, but not limited to:

- extensive abdominal adhesions that may limit ultrafiltration and dialysate flow;
- documented loss of peritoneal function;
- encapsulating peritoneal sclerosis;
- pleuro-peritoneal leak;
- irreparable hernia(s); and
- abdominal aortic aneurysm and colostomy are relative contraindications.

Assesses current knowledge level and patient/parent or caregiver identified learning needs about peritoneal dialysis, develops and implements a plan including, but not limited to:

- benefits and risks associated with peritoneal dialysis including the incidence and nature of complications;
- concerns and questions about peritoneal dialysis; and
- bowel preparation and the importance of avoiding constipation prior to and after catheter insertion.

Postoperative Care

Provides exit site care and educates the patient/parent or caregiver in the postoperative care of the peritoneal dialysis catheter including, but not limited to:
keeping operative site clean to minimize bacterial colonization of exit site and tunnel;
• covering the exit site with an absorbent dressing;
• stabilizing the catheter to minimize catheter movement and prevent trauma to the exit
  site and traction to the cuff(s); and
• cleaning the site as per organization approved standard cleaning protocol.

Dialysis Adequacy

Assesses the patient on an ongoing basis for signs and symptoms of inadequate
dialysis including, but not limited to:

• fatigue;
• loss of appetite;
• nausea;
• vomiting;
• pruritis;
• difficulty concentrating;
• weight loss;
• anemia;
• secondary hyperparathyroidism;
• neuropathy;
• restless legs;
• edema;
• abnormal electrolytes;
• pericarditis/pericardial effusions;
• changes in cognitive function; and
• Poor growth and or weight gain in pediatric patients.

Assesses adequacy of peritoneal dialysis

(a) Assesses possible causes for peritoneal dialysis delivered dose parameters
that are below the minimum acceptable level (i.e. weekly Kt/V < 1.7)
including, but not limited to:

• change in peritoneal membrane transport characteristics;
• membrane failure;
• loss of residual renal function;
• missed peritoneal dialysis exchanges;
• inadequate dialysis prescription; and
• sampling error.

(b) Assesses physical findings including:
Assesses the suitability of the dialysis prescription based on assessment findings and recommends, in collaboration with physician or appropriate health care provider, appropriate volume and frequency of exchanges and target weight.

Collects data and participates in quality assurance activities to improve peritoneal dialysis adequacy outcomes.

Educates the patient/parent or caregiver about dialysis adequacy, the importance of receiving full dialysis treatments, and possible consequences of and complications related to inadequate dialysis.

Peritoneal Dialysis Treatment and Complications

Assesses patient for possible complications associated with peritoneal dialysis including, but not limited to:

Exit Site/Tunnel Infection

- exit site redness;
- drainage;
- tenderness/discomfort;
- overgrown granulation tissue; and
- swelling.

Noninfectious Peritoneal Dialysis Related Complications

- trauma to catheter tract;
- incisional hernia;
- exit site leak;
- intra-abdominal leak;
- genital leak;
- hydrothorax;
- inflow/outflow problems;
- bloody effluent;
• constipation;
• obesity; and
• hyperglycemia.

Peritonitis

• abdominal pain;
• abdominal distention;
• abdominal tenderness;
• cloudy effluent;
• fever;
• nausea;
• vomiting;
• positive culture of dialysate fluid; and
• peritoneal dialysis effluent cell count with white blood cell count >100 cells/μL and >50% neutrophils with or without positive cultures in addition to cloudy effluent and abdominal pain.

Assesses knowledge needs and develops and implements a plan in collaboration with the patient regarding peritoneal dialysis therapy and associated treatments including, but not limited to:

• diet/fluid;
• blood pressure control;
• bowel regimen;
• anemia;
• bone and mineral metabolism; and
• medications.

Medication Management

Assesses medication regimen and develops a plan with the patient that includes, but is not limited to:

• current medication regimens, successes, and challenges;
• assists the patient to simplify medication regimens;
• identifies indications and interactions for commonly administered medications for patients receiving peritoneal dialysis (e.g., erythropoietin stimulating agents, iron supplements, phosphate binders, vitamin D sterols, vitamins, heparin, antibiotics);
• completes and documents a medication history as per unit policy and assesses for any dosing changes, and new or discontinued medications;
• instructs the patient on the proper technique for administration of intraperitoneal medications; and
• educates the patient about medications and assists the patient to simplify the medication regimen where possible.

**Infection Control Practices**

**Assess patient /parent or caregiver knowledge level and patient identified learning needs regarding infection control recommendations associated with peritoneal dialysis and develops a plan in collaboration with the patient to address these needs.**

**Educates the patient about infection control recommendations including, but not limited to:**

- avoiding fresh water (i.e. lakes, rivers, and streams) swimming;
- swimming in ocean or private pool as per program policy; and
- avoiding hot tubs, jacuzzis, soaking tubs, and public pools.

**Follows unit based guidelines for hepatitis B surveillance and administers immunizations as ordered.**

**Links to clinical resources**

International Society of Peritoneal Dialysis Guidelines

**References**


**Other resources supporting practice recommendations**


Self-Managed Dialysis

Hemodialysis and peritoneal dialysis, in their various forms, may be self managed in a limited or fully independent capacity at in-centre units, satellite clinics, self care facilities or at home.

Self management of dialysis, particularly in the home setting, is associated with increased quality of life, improved psychosocial adjustment, increased employment opportunities, and decreased anxiety and stressors (Harwood & Leitch, 2006).

Nephrology nurses play an integral role in the coordination, monitoring, counseling and education of patients and their family/caregiver undertaking self managed dialysis therapies. Ongoing education and support for the patient and caregiver(s) is vital to reduce burnout and ensure ongoing success (Evans, 2012). In providing effective instruction for self-managed dialysis therapies, nephrology nurses apply principles of learning and education theory that are age and developmentally appropriate.

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Assesses current knowledge and motivating factors for considering self care dialysis modalities.

Provides information and clarifies misconceptions about self care dialysis modalities and explores patient self care dialysis modality preference.

Explores the possible benefits and disadvantages of self care dialysis modalities including, but not limited to:

**Benefits**
- increased control over illness;
- increased time for daily activities;
- decreased travel time;
- increased schedule flexibility;
- increased time with family; and
- increased quality of life.

**Disadvantages**
- increased responsibilities;
- training time commitment;
- possible increased stressors;
- accommodation requirements during training period; and
- child care requirements during training.
Assesses patient suitability for self care dialysis including, but not limited to:

- physical stability;
- nutritional status;
- communication ability;
- ability to maintain self care;
- psychological/cognitive suitability; and
- social support and person(s) to be involved in training.

Incorporates information from a variety of sources and completes a learning needs assessment considering:

- current knowledge level and patient identified learning needs in relation to self managed dialysis;
- health history and laboratory values;
- readiness and ability to learn including: current health status and symptoms, effects of medications, mental status, previous knowledge and experiences, motivation, health behaviors and attitudes, and coping skills;
- maturational/developmental readiness including: life experiences, literacy, vocabulary, physical barriers, and problem-solving abilities;
- cultural, ethnic, and religious background;
- patient preferred learning style;
- socioeconomic status; and
- social support networks.

Develops and implements a dialysis self management learning plan in collaboration with the patient to meet identified learning needs.

The plan incorporates the learning needs assessment and also takes into consideration factors that may influence the training process and length of training completion including, but not limited to:

- the knowledge, skills, and abilities to be achieved as a result of education;
- materials appropriate to age, gender, culture, religious orientation, education, language, reading level, and any physical barriers;
- content that is appropriate and understandable;
- realistic and achievable goals;
- an interactive process;
- opportunity for feedback and clarification;
- learning or behavioral outcome;
- nurse/patient ratio; and
- dialysis modality.
The plan includes, but is not limited to:

- principles of dialysis;
- concept of dry/goal/target weight;
- dialysis prescription;
- goals of treatment;
- access management and care;
- dialysis techniques;
- dialysis schedules;
- possible complications;
- signs and symptoms to report;
- identifying problems or concerns that should be reported to the self management dialysis program;
- what to do and who to call in case of emergency;
- trouble shooting technical problems;
- record keeping;
- lifestyle adaptations;
- environment considerations for equipment and procedures;
- diet considerations;
- infection control measures;
- care and cleaning of equipment; and
- disposal of waste.

Assesses medication regimen and develops a plan with the patient that includes, but is not limited to:

- current medication regimens, successes, and challenges;
- educates patient about medication and possible considerations with dialysis treatment modality;
- instructs patient on the proper technique for administration of intradialytic or intraperitoneal medication administration; and
- assists the patient to simplify medication regimens where possible.

References


Other resources supporting practice recommendations


Transplantation

Renal transplantation is the preferred renal replacement treatment for the majority of adults with chronic kidney disease (CIHI, 2013; KDIGO Transplant Work Group, 2009) and is the treatment of choice for the pediatric CKD population (CIHI, 2013). For many patients, renal transplantation, provides improved general quality of life (Landreneau, Lee, & Landreneau, 2010; Danovitch, 2009) and survival advantage over dialysis (Danovitch, 2009). For most patients, transplantation offers a return to a healthier productive lifestyle with different dietary and fluid restrictions which patients generally find more palatable (Danovitch, 2009).

Nephrology nurses play an important role throughout the course of transplantation which incorporates assessment, the surgical procedure, and post transplant care. They are involved in the coordination, monitoring, counseling, and education of renal transplant recipients with regard to the transplant process, the associated potential complications and treatments, as well as health promoting behaviors and risk reduction.

Nurses caring for renal transplant recipients require specialty knowledge and skills to reduce problems in the early post-transplant period by prevention, anticipation and early intervention to maximize short-term and long-term graft outcome (Trevitt et al., 2012). Short-term complications are generally those seen within the first year of transplantation and are most often related to the surgery or immunosuppressive medications (Ding, 2010). Patients receiving a renal transplant require immunosuppressive medications to prevent rejection. These medications require special monitoring and are associated with some significant interactions with many common medications as well as long-term complications. Concordance with these medication regimens can decline over time for reasons that are complex and multifactrial (McPake & Burnapp, 2009) leading to graft failure. Nurses play a pivotal role helping renal transplant recipients achieve improved understanding and concordance with treatments throughout the transplant process (McPake & Burnapp, 2009).

Nursing care of renal transplant recipients also relies on specialty knowledge and skills to assess for and manage long-term complications associated with renal transplantation. Long-term complications post renal transplant include rejection, infection, cardiovascular disease, hypertension, diabetes, dyslipidemia, mineral, and bone disorders, malignancies, (Murphy, 2011; Ding, 2010; KDIGO, 2009). The incidence of cardiovascular disease post transplantation is high and remains the primary cause of mortality for kidney transplant recipients (Murphy, 2011; KDIGO, 2009).

Nephrology nurses work collaboratively with transplant coordinators and the interdisciplinary team to provide holistic evidence informed care to the renal transplant patient population.
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(The practice recommendations addressed in this document are broad in scope and not intended to replace any existing mandatory standards related to renal transplantation.)

Using the best available evidence and best evidence informed guidelines, the nephrology nurse:

Pre-Operative Follow Up

In collaboration with transplant coordinators, and the interdisciplinary nephrology/transplant team, assesses knowledge level and patient/parent or caregiver identified learning needs related to transplantation and in collaboration with the patient develops a plan to meet these learning needs which may include, but is not limited to:

- initiating referral to the transplant coordinator;
- pre transplant evaluation including the need to evaluate for infection, malignancy, cardiovascular risks, peripheral vascular disease risks, immunology risks, and the importance of vaccinations pre transplant while patient is not immunosuppressed;
- evaluation by the transplant team (e.g., surgeon, transplant nephrologist, social worker, recipient coordinator, anesthetist);
- transplant wait list;
- living (related, unrelated, paired exchange) and deceased (after brain death, after cardiac death, extended criteria) donor transplants;
- tissue typing, lymphocyte cross match and panel reactive antibodies;
- advantage of living donation;
- graft survival outcomes;
- notifying the transplant program of changes in health status;
- the need to be healthy at the time of transplant and the possibility of not receiving a transplant if changes have occurred that would prevent a successful transplant outcome;
- possible dialysis pre transplant;
- transplant surgery;
- risks and benefits of transplantation;
- immunosuppression;
- post operative course, length of stay potential complications, diagnostic tests and procedures;
- long-term follow up;
- patient expectations and health goals;
- effect on lifestyle including disability benefits; and
- explores drug coverage for medications post transplant and refers to social worker as necessary.

Assesses current health promoting behaviors and health management strategies
including, but not limited to:

- current health habits and activities to promote health;
- current self care management abilities and adherence to treatment plan; and
- predisposing cardiovascular risk factors (e.g., hypertension, diabetes, dyslipidemia, smoking, obesity).

Assesses for common viruses as outlined in program guidelines with particular attention to cytomegalovirus and Epstein-Barr virus status to determine risk of infection including, but not limited to:

- cytomegalovirus viral load of recipient;
- Epstein-Barr viral load of recipient; and
- cytomegalovirus status of donor.

Administers prophylactic cytomegalovirus and Epstein-Barr virus treatments as per unit protocol.

Post-Operative Follow Up (In-patient Care)

Assesses knowledge level and patient /parent or caregiver identified learning needs related to the anticipated post operative course, possible tests and procedures. Collaborates with the patient’s multidisciplinary team to develop a plan to meet these needs. The plan includes, but is not limited to:

- pain management;
- blood tests to monitor graft function, immunosuppressive medication levels, and potential complications;
- biopsies;
- ultrasounds;
- scans;
- nutrition and fluid requirements;
- activity level;
- signs and symptoms to report; and
- contact number for concerns.

Assesses fluid volume status and electrolyte balance according to unit based policies and protocols including, but not limited to:

- vital signs;
- fluid intake and output;
- weight;
- skin turgor;
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- mucous membranes;
- edema (peripheral, sacral, periorbital);
- central venous pressure monitoring;
- jugular venous distention;
- breath sounds;
- serum electrolytes;
- serum urea;
- serum creatinine; and
- complete blood count.

**Implements and evaluates a plan to manage fluid and electrolyte balance as prescribed and reports deviations from established protocols and parameters to the appropriate health care provider.** The patient may require dialysis for hyperkalemia or fluid volume overload if delayed graft function post transplant.

**Assesses respiratory function to prevent post operative atelectasis and risk for respiratory infection including, but not limited to:**

- respiratory rate;
- rhythm and depth;
- cough;
- sputum;
- breath sounds;
- laboratory results;
- fever;
- pain; and
- oxygen saturation per pulse oximetry.

**Facilitates deep breathing and coughing exercises and mobilization and reports deviations from established protocols and parameters.**

**Assesses for signs and symptoms of graft dysfunction, including rejection, and reports deviations from established protocols and parameters including, but not limited to:**

- increased creatinine;
- immunosuppressive drug levels falling outside of unit based protocols or patient specific parameters;
- decreased or cessation in urine output;
- swelling or pain over the graft;
- fever; and
- elevated blood pressure.

**Assesses for signs and symptoms of urinary obstruction including:**
• decreased urine output;
• bladder distension;
• sense of urgency; and
• lower abdominal pain.

Maintains urinary catheter patency as per unit based protocols and reports deviations from established protocols and parameters to appropriate health care provider.

Assesses transplant operative site including, but not limited to:

• swelling;
• redness;
• drainage;
• bleeding;
• tenderness; and
• impaired healing.

Assesses surgical drains for patency and amount color and consistency of drainage. Provides wound care as per unit guidelines.

Assesses for signs and symptoms of wound complications such lymphocele, hematomas and abscess formation that may cause pressure to the transplant site resulting in reduced kidney function including, but not limited to:

• graft tenderness;
• decreased or cessation of urine output;
• elevated creatinine;
• pelvic/abdominal swelling;
• leg swelling on the same side as the graft;
• urinary incontinence; and
• drainage from wound or increased drainage from surgical drains.

Assesses for signs and symptoms of infection and reports deviations from established protocols and parameters including, but not limited to:

• fever;
• chills;
• wound drainage;
• elevated white blood cell count;
• thrush/oral lesions;
• rhinorrhea;
cough;
dysuria;
hematuria;
urinary frequency;
foul smelling urine;
cloudy urine;
flank pain;
nausea and or vomiting; and
rash.

Administers immunosuppressive and other medications as ordered. Monitors and evaluates patient response to medication therapy including, but not limited to:

- patient reported signs/symptoms;
- laboratory results of drug levels;
- serum creatinine;
- complete blood cell count; and
- liver function tests as necessary.

In preparation for discharge, assesses current patient knowledge level and self-management abilities regarding immunosuppressive and other medications. Develops a plan in collaboration with the patient and appropriate health care provider to meet these needs including, but not limited to:

- side effects;
- interactions (with other medications, foods and beverages);
- precautions;
- what to do if medication vomited or forgotten; and
- symptoms to report.

Assesses knowledge level, patient identified learning needs and self management abilities related to discharge planning in collaboration with the patient, and develops a plan in collaboration with the patient and multidisciplinary team to meet these needs including, but not limited to:

- medication management;
- wound management;
- nutritional changes;
- increased susceptibility to infection;
- increased susceptibility to severe neurological forms of West Nile virus;
- signs and symptoms of infection;
- signs and symptoms of rejection;
- signs and symptoms of mechanical complications such as urinary retention;
Promotes participation in care and self management as able.

Post-Transplant Follow Up (Out-patient Care)

Assesses for signs and symptoms of acute rejection and chronic allograft nephropathy including, but not limited to:

- graft swelling and tenderness;
- increasing creatinine trend;
- immunosuppressive drug levels falling outside established protocols or patient tailored regime;
- concordance with immunosuppressive and other medication regimen;
- proteinuria;
- hematuria;
- hypertension;
- weight gain;
- edema; and
- decreased urine output.

Assesses for signs and symptoms of infection and reports deviations from established protocols and parameters including, but not limited to:

- fever;
- chills;
- wound drainage;
- elevated white blood cell count;
- elevated creatinine;
- thrush/oral lesions;
- rhinorrhea;
- cough;
- dysuria;
- hematuria;
- urinary frequency;
- foul smelling urine;
- cloudy urine;
- flank pain; and
- rash.

Assesses current knowledge level and learning needs about infection associated with
renal transplantation and develops a plan to meet these learning needs including, but not limited to:

- preventive measures for infection;
- signs and symptoms of infection; and
- reporting and seeking help.

**Common Infections:**

- most common infections 0-1 month post transplant include candida, urinary tract infection, wound infection, line sepsis, pneumonia, and herpesvirus (Dubberke & Brennan, 2012);

- most common infections 1-6 months post transplant infections include: polymavirus, cytomegalovirus, pneumocystis carinii, hepatitis B and C, aspergillus funigatus, candida, nocardia, toxoplasma gondii, listeria monocytogenes, histoplasmosis, coccidiomycosis (Dubberke & Brennan, 2012), and Epstein-Barr virus (Danovitch, 2009).

- most common infections beyond 6 months post transplant include community acquired infections cytomegalovirus retinitis, cryptoccus, polyomia virus, mycobacteria (Dubberke & Brennan, 2012).

**Assesses transplant immunosuppression and other medication management including, but not limited to:**

- review prescribed medication regimen;
- assess ability to manage regimen and adherence to regimen including reasons for non concordance such as side-effects and financial difficulties;
- explore patient concerns and perceived barriers and challenges with regimen;
- assess knowledge deficits regarding immunosuppressive medications; and
- assess bowel habits for potential changes in medication absorption or gastrointestinal function.

**Develops a plan in collaboration with the patient and addresses knowledge deficits, concerns, and barriers around immunosuppressive medication regimen.**

**Assesses for common post transplant cardiovascular risk factors including, but not limited to:**

- hypertension;
- diabetes: pre-existing or new onset;
dyslipidemia;
obesity; and
smoking
  o assesses patient for smoking;
  o explores patient level of motivation for smoking cessation;
  o provides information about effect on health in the context of renal transplant
    and increased risk for cardiovascular disease; and
  o provides information about smoking cessation programs.

Assesses patient for signs and symptoms of malignancy including, but not limited to:

  persistent unexplained fever;
  weight loss;
  new lumps or masses; and
  skin lesions.

Assesses current knowledge level and patient identified learning needs about the increased risk for malignancy associated with anti-rejection medications and develops a plan in collaboration with the patient to meet these learning needs including, but not limited to:

  increased risk for some types of cancers (i.e. non-melanoma skin cancer, lymphoproliferative disorders, cancer of the kidney and urinary tract, cervical carcinoma, liver cancer);
  importance avoiding sun exposure and wearing of sun screen;
  importance of checking skin regularly to note changes in moles and pigmentation;
  importance of regular screening investigations such as: Papanicolaou smear, mammograms, prostate specific antigen screening, and colorectal screening;
  importance of reporting persistent fever, weight loss, new lumps or masses, skin lesions;
  importance of avoiding first and secondhand smoke;
  importance of immunizations (no live vaccines); and
  importance of regular follow up with transplant team, family doctor and other specialists as applicable.

Assesses for risk factors as well as signs and symptoms of post transplant mineral and bone disorders including, but not limited to:

  bone or joint pain;
  pretransplant bone and mineral disorders (hyperparathyroidism, dialysis related amyloid bone disease);
  avascular bone necrosis;
  obesity; and
• immunosuppression related bone disease.

**Assesses current knowledge level and patient identified learning needs about increased risk for bone disease and treatments to reduce risk post transplant. Develops a plan in collaboration with the patient to meet these learning needs.**

**Educates patients about increased risk for bone disease including, but not limited to:**

- the potential need for calcium supplements, vitamins, vitamin D, bisphosphonates;
- bone mineral density testing;
- weight bearing exercise;
- limiting alcohol consumption; and
- importance of not smoking.

**Assesses knowledge level, patient identified learning needs, and readiness to learn of patients with progressive renal insufficiency and chronic allograft deterioration. In collaboration with the patient and interdisciplinary health care team develops a plan to meet these needs. The plan may include but, is not limited to:**

- grief counseling and psychological support;
- education about mineral metabolism and progressive renal insufficiency;
- education about nutritional and fluid requirements;
- education about anemia related to progressive renal insufficiency;
- education about dialysis treatment modalities and conservative management;
- access planning;
- information about advance directives;
- information about chronic kidney disease care delivery setting and other relevant health care service information;
- collaboration with, and or referral to chronic kidney disease clinic;
- collaboration with, and or referral to dialysis program; and
- referral to transplant coordinator.

**Pediatric Considerations**

Within the field of kidney transplantation, pediatric recipients are a unique population. The incidence of kidney disease in children in Canada is less than that seen in the adult population (Danovitch, 2005). The pediatric transplant recipient can range in age from 1 to 18 years. Care must envelope specific transplant treatment and also be adapted for the age of the recipient. Parents are an integral part of the team. If a transplant is done when a child is very young education of the child/teen must be ongoing as the child ages. Additional support for teens and parents must be provided as the youth adapts to the self management role during development to adult maturity.
There are several crucial concepts of importance that must be considered when planning the care of the pediatric renal transplant recipient. The nephrology nurse working with the pediatric renal transplant population should incorporate the concepts in the practice recommendations previously listed.

**Important concepts of pediatric renal transplant care for incorporation in the practice recommendations include but are not limited to:**

- **Primary diagnosis**
  - Goal: pre-emptive transplant whenever possible;
  - greatly impacts planning and timing for transplantation (Danovitch, 2009);
  - corrective or constructive urological surgery may be required pre-transplant.

- **Donor source**
  - living donation is strongly encouraged as there is statistical evidence of improved success rates (Danovitch, 2009):
    - particularly true with younger aged children;
    - facilitates planning of transplant surgery which can be particularly important in the very small child;
  - an adult sized kidney from a relatively young adult is the best option (Magee et al., 2004).

- **Immunology**
  - infections:
    - higher risk of primary and new strain CMV, EBV and BKV infections
    - higher risk of diarrheal infections;
    - high risk of other viral community acquired infections (Fonescea-Aten, Michaels, 2006).
  - vaccinations:
    - imperative all immunizations be up-to-date pre-transplant;
    - ‘live’ vaccinations cannot be administered post transplant;
    - ongoing monitoring of protection required;
    - if immunity becomes non-existent recipient must be informed regarding precautionary measures.
  - immunosuppression:
    - induction therapy is routinely used in the majority of pediatric transplants (Danovitch, 2009);
    - maintenance therapy is generally higher than that required in the adult population.

- **Complications**
  - surgical considerations related to transplanting an adult sized kidney into a child (Salvatierra, Millan, Concepcion, 2006):
    - vascular challenges;
    - fluid requirements.
  - medical:
    - major challenges related to fluid management continue
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- increased risk of PTLD secondary to increased need for higher requirements of immunosuppression and primary EBV infection, careful monitoring essential

- Growth and development
  - lack of growth indicates need for transplantation even if child has not reached CRF Grade V (non-responsive or unable to use growth hormone);
  - catch up growth can be seen in the young child post transplant (Fuqua, 2006; Tonshoff & Mehis, 1997).

- Psycho-social concerns
  - family
    - disruption of family unit (relocation of parent with child to be close to treatment).
  - adolescent/youth
    - high risk of graft loss during adolescence (Magee et al., 2006) (care given must anticipate and decease risk);
    - transition planning of transfer of care of the youth to an adult program is imperative for both pediatric and adult care teams.

Links to clinical resources:


http://download.journals.elsevierhealth.com/pdfs/journals/0272-6386/PIIS0272638610008395.pdf


National Kidney Foundation, KDOQI. (2011). Managing kidney transplant recipients, a clinical guide for nephrology and transplant health professionals:  
References


Other resources supporting practice recommendations


Acknowledgements

2013 Nephrology Nursing Standards and Practice Recommendations Revisions
Project Lead:

Marsha Wood BN, RN, MN, CNeph (C),
Nurse Practitioner Nephrology, Capital District Health Authority,
Halifax, NS

2013 Nephrology Nursing Standards and Practice Recommendations Revisions
Working Group:

Jan Baker RN, BN, CNeph(C)
Patient Care Manager, Halton Healthcare Services: Renal Department
Oakville, ON

Marilyne Boudreau INF, CNeph(C)
Infirmière Ressource, Néphrologie / Resource Nurse Nephrology
Réseau de santé Vitalité Health Network, zone 6

Ruth de Boer RN, BAH, C Neph (C)
Nurse Clinician Advance Care Planning
Southern Alberta Renal Program

Tina Drainville, RN, CNeph(C)
Clinical Nurse Educator, Regional Renal Program
Gander, NL

Nicole Florent RN, BA, MPA, LLM, CNeph(C)
Peritoneal Dialysis Unit, Kingston General Hospital
Kingston, ON

Marian Girodat RN, CNeph(C)
Pediatric Hemodialysis, McMaster Children’s Hospital
Hamilton, ON

Billie Hilborn RN, BScN, CNeph(C), MHSc
Hemodialysis Educator, Sunnybrook Health Sciences Centre
Toronto, ON

Sandra Lagacé, i.i., B.Sc.Inf., CNeph(C)
Infirmière gestionnaire par interim / Acting Nurse Manager
Hémodialyse et Télénéphrologie / Hemodialysis and Tele nephrology
**Lisa Lillebuen RN, BScN, CNeph(C)**  
Clinical Nurse Educator, Home Therapies  
Northern Alberta Renal Program

**Marilyn Muir RN, CNeph (C)**  
CRN, Manitoba Renal Program  
Winnipeg, MB

**Mari Sarian RN, DESS, MScN, CNeph(C)**  
Clinical Nurse Specialist Nephrology  
Jewish General Hospital  
Montreal, QC

**Colleen Wile RN, BScN, CNeph (C)**  
CANNT Past-President (2013-2014)  
Clinical Nurse Educator, Community Dialysis, CDHA  
Halifax, NS

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**Rosalie Starzomski RN, PhD**  
Professor, School of Nursing, University of Victoria  
Clinical Ethicist

2013 Nephrology Nursing Standards and Practice Recommendations Expert Content Review Contributors:

**Rajneet Atkar RN, MN, CNeph(C)**  
Clinical Nurse Educator, South Calgary & Fanning Dialysis Units  
Southern Alberta Renal Program

**Laura M. Caines RN, CNeph(C)**  
Transplant Coordinator, PRI Clinic Nurse Renal Clinic, Western Memorial Regional Hospital  
Corner Brook, NL

**Wanda Dean RN, BSN, CNeph(C)**  
Regional Renal Clinical Nurse Educator  
Northern Health  
Prince George, BC
Pamela Dill PDt  
Renal Dietitian, Capital District Health Authority  
Halifax, NS

Cheryl Harding BN, RN, MHS, CNeph(C)  
Coordinator of the Provincial Kidney Program, Department of Health and Community Services  
St. Johns, NL

Betty Kelman RN, MEd, CNeph(C)  
Nurse Practitioner (Adult)  
Toronto, ON

Anastasia Klerononos-MacAlpine PDt  
Renal Dietitian, Team Lead, Capital District Health Authority  
Halifax NS

Julie Ann Lawrence RN(EC), MScN, CNeph(C)  
Nurse Practitioner Kidney Care Centre, Westmount Shopping Centre,  
London, ON

Susan MacNeil RN, BN  
Manager, Nova Scotia Renal Program  
Halifax, NS

Jane Ridley, RN, MScN, CNeph(C)  
Nurse Practitioner Nephrology Program, University Campus, London Health Sciences Centre,  
London, ON

Isabelle Thibeault BN, RN, MN, DESS, CNeph(C)  
Nurse Practitioner Nephrology  
CSSS de Chicoutimi, QC

CANNT Office:

Heather Reid – National Administrator  
Sharon Lapointe – Membership Coordinator  
Susan Mason – Website and Social Media