

# Patient Care Technicians Managing Hemodialysis Central Venous Catheter Care: Pro and Con



Paul N. Bennett  
Gail Dewald

## Patient Care Technicians Managing Hemodialysis Central Venous Catheter Care: Pro

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If you are reading this article, you are likely to have already developed your own views on whether patient care technicians (PCTs) should or should not manage central venous catheters (CVCs). These views have been developed through your own years of hemodialysis experience because there has been limited research exploring PCTs managing CVCs. One aspect of this debate we agree on is that patient quality care and safety are paramount.

To achieve quality care and safety, the appropriate involvement of PCTs includes education, professionalism, and a culture of safety that transcends beyond CVC management. I will contend in this review that the appropriate involvement in PCT care of CVCs can enhance and not decrease patient safety and patient quality care. This article will use often heard experiential statements on why PCTs should not manage CVCs to build a case that PCTs can contribute to improved CVC care and patient safety. However, this article should not be a green light for ill-directed dialysis providers to use inexpensive, medically untrained, and inexperienced direct-care providers to enhance financial profitability.

### Contention 1: PCTs Do Not Have the Skills, Education, or Professionalism to Manage CVCs

CVC management involves assessment, catheter site dressing, connection, intradialytic monitoring, disconnection, and intra-catheter lock instillation (Pryor & Brouwer-Maier, 2017). Pre-dialysis assessment of the CVC and site is a procedure similar to the assessment of arteriovenous fistulae (AVFs) and arteriovenous grafts (AVGs), consisting of a one-minute "Look, Listen, and Feel" assessment (observing for redness, drainage, bleeding, and cuff expo-

*Paul N. Bennett, PhD, BN, RN, DipNg, Renal Cert., GradCertSc(App Stats), MHSM, is an Honorary Professor, Deakin University, Melbourne, Victoria, Australia; and Director of Medical Clinical Affairs, Satellite Healthcare, San Jose, CA.*

*Gail Dewald, BS, RN, CNN, is an Independent Nephrology Nurse and Managing Partner, Dewald and Associates, San Antonio, TX; and a member of ANNA's Alamo City Chapter.*

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**Note:** The Learning Outcome, additional statements of disclosure, and instructions for CNE evaluation can be found on page 455.

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*In the United States, the responsibilities and scope of practice of nephrology nurses and patient care technicians working in hemodialysis units vary from state to state. This occurs in relation to the care and management of central venous catheters (CVCs) used for hemodialysis. The aim of this article is to review the pros and cons of non-nursing staff performing the management and care of CVCs. The pros include decreasing nursing task time, allowing nurses to devote their time to other higher functioning roles, while the cons include lack of technician skill, education, and experience to perform CVC management and care.*

**Key Words:** Central venous catheters, hemodialysis, patient care technicians, nephrology nurses, patient care, patient safety.

## Patient Care Technicians Managing Hemodialysis Central Venous Catheter Care: Con

Gail Dewald

The registered nurse (RN), by law, is tasked to provide comprehensive nursing assessments, skilled patient care, patient education, delegation and supervision of tasks to assistive personnel, and appropriate actions based on nursing judgment in these areas. When a patient with a central venous catheter (CVC) presents for hemodialysis care, it becomes a dilemma for the RN in many states that allow (or do not legally restrict) the RN from delegating the task of care for the CVC patient to the patient care technician (PCT). Who is the best choice to provide the comprehensive assessment that leads to the safe treatment of the patient? Who is the best choice to care for the patient who has a higher risk of deadly complications due to the CVC access? Who has the best judgment when problems arise with the CVC? The answer is – the nephrology nurse.

### Contention 1: PCTs Do Not Have the Skills, Education, or Professionalism to Manage CVCs

In many states, the rules of delegation do not allow the RN to delegate assessment of the patient. The RN has in-depth education in physical assessment skills. These skills cannot be substituted with "on the job training" of PCTs.

sure at site, and assessing the integrity of catheter tubing and caps; listening to the patient for signs of symptoms; and feeling for pain and site drainage) (Pryor & Brouwer-Maier, 2017). PCTs can learn these assessment skills similar to how they learn and become competent at cannulation skills. These skills are currently learned by non-professional patients on home hemodialysis who manage their CVCs at home.

Education and training to develop CVC management competence for PCTs is imperative. Infection control and vascular access care are already a part of PCT certification (Burrows-Hudson, Kammerer, Farrow, Zimmerman, & Yang, 2014) with mandated continuing education. Despite the Fistula First Catheter Last Initiatives (End Stage Renal Disease National Coordinating Center, 2016) and the Kidney Dialysis Outcome Quality Indicators (National Kidney Foundation, 2015), the prevalence of CVCs as a hemodialysis access remains high (Saran et al., 2017). Combining PCTs' in-depth knowledge of patients with evidence-based CVC knowledge may even increase the early conversion of CVCs to AVFs and AVGs (Vachharajani, 2011). Mandating and increasing the education and certification of both RNs and PCTs, as promoted by both American Nephrology Nurses' Association (ANNA) and the National Association of Nephrology Technicians/Technologists (NANT) (ANNA, 2016), and facilitated through inter-professional clinical learning models (Gum et al., 2012), will contribute to a more capable PCT workforce able to care for CVCs at a similar level to RNs.

The professionalism of PCTs who do not undergo formal education has been questioned; however, the role has evolved with PCTs performing practices previously thought of as the province of professional nurses. This is supported by PCTs' beliefs about professionalism that are similar to those of nurses and physicians (Ellingson, 2011). PCTs frequently act as professionals in that they multitask, are skilled observers (Ellingson, 2011), know their patients (Bethea, 2007), and frequently detect and respond to patient adverse events, such as hypotensive episodes (O'Keefe, 2014). I suggest here that the skills, education, and professionalism required to act on a life-threatening hypotensive episode during a hemodialysis treatment or cannulate a difficult hemodialysis access are at least equivalent, if not at a higher critical thinking level, than assessing and managing a CVC.

## **Contention 2: CVCs Can Have Life-Threatening Complications**

Clearly, there are risks associated with CVCs, including air embolism, bleeding, catheter splitting, incorrect disconnection, bloodstream infections, tunneled infections, and site infections (O'Keefe, 2014; Pryor & Brouwer-Maier, 2017). However, the greater risk of the procedure does not mean it is not a technical procedure that can be followed using a standardized protocol in the relevant scope of practice. Examples of technicians working in high-risk areas, such as cardiac catheter laboratories, operating rooms, and

The nursing process and critical thinking skills are at the core of nursing practice and are needed for patients with CVCs. PCTs do not have training in the nursing process and critical thinking. RNs anticipate patients' needs and have a keen intuitive sense about situations that help keep patients safe. According to Dinwiddie (2004), immediate assessment is needed with catheter dysfunction. "Events that compromise the function and integrity of the catheter must be assessed immediately and treated according to the severity of risk" (Dinwiddie, 2004, p. 654). A PCT cannot provide this assessment and does not have the authority or critical thinking skills to change treatment without direct supervision of an RN. When providing hemodialysis treatments for patients with CVCs, the assessment skills of the nurse are the key to a successful treatment and appropriate management.

PCTs can surely be as professional as RNs, but RNs have ranked #1 as the most trusted profession for 15 years in a row (American Nurses Association, 2016). A PCT cannot surpass an experienced RN when a patient is in need.

## **Contention 2: CVCs Can Have Life-Threatening Complications**

Hemodialysis is a technical and complicated process that is not to be taken lightly. Patients with a CVC are at higher risk of life-threatening complications. In a systematic review of the literature, Ravani and colleagues (2013) found that "persons using catheters for hemodialysis seem to have the highest risks for death, infections, and cardiovascular events compared with other vascular access types" (p. 465). Assigning the RN who has expert training and the accountability of a license makes the most sense for the safety of those patients. "The long-term impact of dysfunctional catheters is the ever-increasing risk of life-threatening bacteremia and secondary infections, as well as the potential damage to the central vessels resulting in stenosis and occlusion" (Dinwiddie, 2004, p. 660). Data from the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN) surveillance system show that the incidence of bloodstream infections is about 9 times higher in patients with CVCs than in those with arteriovenous (AV) fistulas, and about 5 times higher in patients with CVCs than in patients with AV grafts (Klevens, Edwards, & Gaynes, 2008).

Patients on home hemodialysis and their caregivers are trained for a 4- to 6-week period to provide home hemodialysis. According to McLaughlin and colleagues (2008), patients who choose home hemodialysis are motivated by three perceived advantages: freedom, lifestyle, and control. These motivations enhanced their ability to listen and learn to ensure that they could perform at home. Before training is completed, the home hemodialysis training nurse ensures that the patient and caregiver are competent to care for themselves and that they are dedicated to follow the procedure. The question

emergency departments, exemplifies this point. A case can be made that given the prevalence of CVCs, the more direct care clinical staff who have the training to recognize early stage CVC complications, the greater the chance of early recognition and treatment (Vachharajani, 2011). The contradiction in many of our programs occurs when we allow patients to perform home hemodialysis with CVCs, yet we do not allow PCTs to perform these same procedures.

### **Contention 3: The Nephrology Nurse's Role Is Being Eroded by Paraprofessionals**

The question of "What do we do that is nursing" can be seen from an individual, legal, professional, and ethical perspective, and may include patient advocacy, applying evidence into practice, caring, skills, and experience (Bennett, 2011). The CVC work is technical, an example of how, as nurses, we have become technically enframed (Bevan, 1998). Most nephrology nurses who work in hemodialysis units already struggle with the technological priorities that exist in hemodialysis, which detracts from the ultimate nurse/patient relationship requiring trust, time, and empathy (Bennett & Neill, 2008; Wellard, 1992). Although CVC care is nursing time spent with patients, trusting nurse/patient relationships are hard to build with masks and gowns adorned. Therefore, CVC care actually detracts from the nurse's professional role because it takes away quality patient/nurse contact time.

The care of CVCs by only registered nurses (RNs) can create stress for RNs, PCTs, and patients. Frequently, in hemodialysis centers with high CVC use, PCTs have to wait for busy RNs to either connect or disconnect the patient undergoing hemodialysis. This situation can waste time for both patients and PCTs, and can disturb an already tight treatment schedule, resulting in increased stress for patients and staff.

History shows us that hemodialysis has evolved through physician, nurse, technician, engineer, pharmacist, dietician, and social worker input. This is a multi-professional clinical environment where we all do our role that involves placing the patient at the center of our care. The notion that nurses will lose their role defies any historical perspective of the importance of nurses in the dialysis context (Fetherstonhaugh, 2009; Hoffart, 1989). RNs working in hemodialysis units have never been busier than today, and there is much evidence that this busy-ness contributes to stress and burnout (Dermody & Bennett, 2008; Hayes, Douglas, & Bonner, 2015). Therefore, the contention that enabling PCTs to care for CVCs will erode the RN's role seems irrational and illogical.

### **Contention 4: Large Dialysis Providers Want PCTs Caring for CVCs to Reduce RNs and Increase Profits**

The unique development of U.S. dialysis provider models is like no other in the world. The goals behind PCTs managing CVCs may lead to a more optimal model

is asked: If a patient or lay caregiver can be trained to access the CVC, why not a trained PCT? Almost half of the states in the U.S. allow the PCT to access catheters, either through direct legal language or through delegation rules (O'Keefe, 2014). There are many trained (and competent) PCTs, but the piece that is missing is the nursing assessment. A patient on home hemodialysis is trained to know his or her body and what it is telling them through vital signs and weight evaluations. The PCT cannot provide a complete assessment because it is a learned nursing task.

### **Contention 3: The Nephrology Nurse's Role Is Being Eroded by Paraprofessionals**

The work of the nephrology nurse has changed dramatically over the last 40 years. In the early days of hemodialysis, RNs mixed dialysate and wrapped dialyzers. With the abundant use of assistive personnel, such as PCTs, the role of the RN has become more supervisory and managerial. Thus, there are still many areas where only an RN will do. Patient education is one of those areas. The RN is accountable for the health education of every patient, and most RNs enjoy that role. Another role that the RN provides is working with the interdisciplinary team to develop the patient plan of care after providing a comprehensive nursing assessment. The RN is also accountable for using nursing judgment when problems arise and re-assessment of the patient is required.

Improvements in outcomes have been made over the last 15 years. These improvements include the decrease in long-term CVC access. The United States Renal Data System (USRDS) (2015) shows that since 2003, all-catheter use has declined from 27% to 19% of patients, and that in 2013 (the last year calculated), only 8% of prevalent patients on hemodialysis have been utilizing a catheter for greater than 90 days. The University of Michigan's Kidney Epidemiology and Cost Center (2016), which develops the Dialysis Facility Reports (DFRs), shows that 9.9% of patients on hemodialysis have been using a catheter greater than 90 days across the U.S. Using these numbers, an average-size hemodialysis clinic of 100 patients would serve 8 to 10 patients with CVC access. The burden of providing hands-on care by an RN for those few patients with CVC access is minimal. Those clinics that have higher rates of CVC patients also have higher acuity rates, and therefore, it becomes the responsibility of the governing body/owner to provide more licensed personnel to serve patients. In these clinics, it is the responsibility of the Quality Assessment and Performance Improvement (QAPI) committee to analyze why CVC rates are high and to develop action plans to decrease those rates. If the correct mix or the correct number of staff is not provided, the facility is at risk for adverse outcomes and burnout. Nursing burnout is not created from the "hands-on" care of patients. Nursing burnout is created when nurses feel that a culture of safety is not provided



because nurses can focus on nursing and less on routine technical care. ANNA (2016) states that the ultimate goal of the nursing process “is to effect positive patient outcomes in the most cost effective way” (p. 1). Notwithstanding the many different definitions of *cost-effective*, RNs who focus on nursing work would appear to contribute to a value-driven, cost-effective, and efficient model of care.

Models of care around the world range from all nursing models (Polaschek, Bennett, & McNeill, 2009) to a technician-dominated workforce (Tino, 2010). The argument for higher RN ratios in hemodialysis centers is gaining momentum, with emerging evidence supporting greater safety and better patient outcomes with higher RN-staff ratios (Thomas-Hawkins, Flynn, & Clarke, 2008). Higher RN ratios, with RNs providing focused nursing care, will further improve care and patient experience. Rather than allowing dialysis providers to dictate nursing work, nurses can redirect their nursing work to improve cost-effectiveness for the healthcare system and dialysis providers.

#### **Contention 5: State Regulations Will Not Allow Technicians to Perform CVC Management**

As of 2014, only five states in the U.S. had specific legal language allowing PCTs to manage CVCs (O’Keefe, 2014). Other varying practices that occur from state to state include the administration of heparin and the infusion of normal saline (Garbin & Chmielewski, 2013). Globally, PCTs perform a range of roles specified by scope of practice regulations (Elseviers et al., 2006; Lopot, 2001).

The varying regulations, spurious as they are, need to be followed to safeguard PCTs’ credentials and employment (Ellingson, 2008). The challenge for many PCTs is that they hold little authority within the organizations that employ them, but they are expected to perform with a discourse of professionalism (Ellingson, 2007). This results in many experienced PCTs accepting a frustratingly lower hierarchical role, both in authority and income, potentially encouraging non-professional behavior. Matching skillsets, such as CVC management, with PCT roles may have a positive impact on the professionalism of the PCT workforce and patient safety.

The way forward is to consider the inclusion of CVC care into the master technician role description. PCTs or master technicians would only be permitted to perform CVC assessment, connection, and disconnection once they had been trained and had passed CVC competency. Although this would create challenges with some states’ legislation, it would ensure that patient safety would be upheld, while at the same time, improving flow, quality, and efficiency of care.

#### **Conclusion**

In summary, I return to the issue of patient safety. Whatever our model of care and scope of practices, we all should aim for the highest possible level of safety in our hemodialysis centers. Engaging all staff in infection control practices, including CVC management, requires our focus

in the work/care environment and they are not supported in their efforts to make changes to improve the environment. Kliger (2015) writes: “It is therefore important that medical directors understand the sources of risk to dialysis patients and champion process improvements to keep their facilities safe” (p. 688). Assigning the RN to care for patients with a CVC is the safe thing to do.

#### **Contention 4: Large Dialysis Providers Want PCTs Caring for CVCs to Reduce RNs and Increase Profit**

Large dialysis provider models utilize PCTs in every way legally possible. There is no set national ratio of PCTs to patients. In states without licensure rules, the ratios can be as high as 6:1. PCTs are expected to initiate hemodialysis, troubleshoot equipment, monitor, and discontinue treatment on 6 patients every shift. Federal rules require an RN be on site at all times when patients are undergoing hemodialysis to supervise and provide the nursing process to all patients under his or her care. The RN is accountable for any/all errors that take place, making it mandatory that supervision and direction by the RN takes place. Several states are looking to increase the RN-to-patient ratio (e.g., 1:8 patients) and increase the PCT-to-patient ratio (e.g., 1:3 patients). In a survey of patients on hemodialysis, nearly half responded that at times, they had concerns for their safety in the hemodialysis facility (Kliger, 2015). The RN by license is required to “maintain a safe environment” (American Nephrology Nurses’ Association [ANNA], 2015, p. 1). In situations in which patient ratios are overwhelming, it is difficult to maintain a safe environment.

Personal experience found me in a state that allowed PCT staff to care for patients with CVC access. While observing care at one facility, the initiation and discontinuation of treatment was performed on every patient by PCTs. The patients had a mix of access types, including CVCs. There was no “hands-on” care by the one RN on duty that day. During the busy turnover time, observation of the RN found her stripping machines, cleaning machines and chairs, and setting up for the next shift of patients. The role reversal observed here went against all the principles I had ever experienced as a nurse, and it was chilling. This is reality when there are no rules guiding owners and the governing body on ratios and job responsibilities. The process of providing treatment to patients with a CVC felt like it was a task at that clinic and that the RN supervision of a safe environment was absent.

#### **Contention 5: State Regulations Will Not Allow Technicians to Perform CVC Management**

As of 2014, 24 states forbid PCTs from accessing CVCs; 18 states have broad RN delegation language that may allow access of a CVC by PCTs; and seven states allow PCTs to access the CVC without delegation (two of which are silent in their language) (O’Keefe,

to be on communication, teamwork, perceptions of patient safety, staffing, organizational learning, accountability, and patient engagement (Kear & Ulrich, 2015). The decision to include PCTs in CVC care will ultimately depend on state legislation, provider policy, medical directors, and nephrology nurses, but it should not be discounted in our quest for high quality, scheduling efficiency, decreased staff and patient stress, and safe hemodialysis care.

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2014). Care of any patient by an unlicensed person requires RN supervision. The ANNA *Position Statement on Delegation of Nursing Care Activities* outlines the Five Rights of Delegation (ANNA, 2015):

- The right task.
- Under the right circumstances.
- To the right person.
- With the right directions and communications.
- Under the right supervision and evaluation.

The position statement goes on to say that the RN “must never delegate a nursing care activity that requires:

- The knowledge and expertise derived from completion of a nursing education program and the specialized skill, judgment, and decision-making of a registered nurse.
- Complex observation, critical decision-making, exercise nursing judgment, or repeated nursing assessments.
- An understanding of the care nephrology nursing principles necessary to recognize and manage real or potential complications that may result in an adverse outcome to the health and safety of the patient” (ANNA, 2015, p. 1).

The document closes saying that “the relationship between the registered nurse and the patient constitutes a legal and binding contract. The existence of this contract has been established through case law” (ANNA, 2015, p. 2).

## Conclusion

The nephrology nurse in the hemodialysis facility is the captain of the ship no matter who is initiating dialysis on patients with a CVC. The tone of the day is set by the communication of the RN charge nurse. Assignments are made by the RN taking into account the ability of the personnel on duty, the acuity of the patient(s), state and federal regulations, and the overall work that needs to be done to ensure safe and effective care to patients. Errors in hemodialysis care can cause harm and death. While hemodialysis machines are rarely a major cause of morbidity, human factors at the machine interface, and sub-optimal communication among caregivers are common sources of error (Kliger, 2015). PCTs are a much needed and fully appreciated part of the hemodialysis team, but have not had training to fulfill the needs of many patients. The RN working in the hemodialysis unit has been trained and licensed in communication, physical assessment, the nursing process, and critical thinking. The RN has a legal obligation to each patient. The care of the patient with a CVC has critical elements that require nursing skills that the PCT has not acquired in their training and practice. I appeal to the states that allow (or do not restrict) care of the patient with a CVC by a PCT to reconsider the safety of the patients of their state who require hemodialysis care with a CVC today or in the future.

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