Overview of the Role of a Vascular Access Nurse Coordinator in the Optimization of Access Care for Patients Requiring Hemodialysis

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The role of the vascular access coordinator is a highly specialized role that has been developed because of the complexity of vascular access for hemodialysis and the episodic nature of the complications that arise over time. This paper is an overview of the experience of a nephrology nurse who created and filled such a role in a large academic center in the US. Support for the role in the literature is cited, including the latest iteration of the KDOQI guidelines. [Hong Kong J Nephrol 2007;9(2):99–103]

Key words: hemodialysis, nurse coordinator, vascular access

INTRODUCTION

Vascular access is a prerequisite for hemodialysis. That simple statement of fact understates the complexity of establishing and maintaining vascular access sufficient to provide adequate dialysis for long-term kidney replacement therapy and additionally camouflages the episodic nature of complications [1].

If there was just one kind of vascular access that any patient could have, that required only an initial creation/installation, and was complication (and therefore maintenance) free, there would be no problems. Unfortunately, because of the variable nature of patients’ anatomy, physiology and pathology, there is no “one size fits all” and “happily ever after” conclusion for adequate vascular access. And even if there were, many vascular access complications are secondary to patient and clinician ignorance, inexperience, and/or error. The cost of vascular access to the patient and society in both dollars and quality of life is substantial, both initially and over time.

The dollar cost in the US for 2006 has been estimated at greater than $3 billion [2]. These costs are compounded by lack of organization causing delayed scheduling, missed appointments, and surgery cancellations due to improper patient preparation.

Many vascular access complications are both predictable and avoidable. This knowledge was the genesis for the original Dialysis Outcomes Quality Initiative (DOQI) Guidelines for Vascular Access in 1997. The composition of the workgroup for that initiative showed that the complexity of identifying best practices for vascular access outcomes required input from all the disciplines and specialties involved, i.e. nephrologists, vascular surgeons, interventionalists, and nurses. It was not until the revision of 2006, however, that the concept of the vascular access team (VAT) was included in the guidelines as a prerequisite for best practices and better outcomes through a continuous quality improvement (CQI) process [3].

Creating a VAT requires more than compiling a list of the names and roles of the clinicians who care...
for the patient. Team dynamics necessitate not only having qualified members to fill the necessary roles but also a high degree of cohesion and communication among them. This is difficult to achieve when the various team members are in different locations and the needs are episodic as is the case with vascular access care. Hence the need for a vascular access coordinator (VAC).

Typically, this role is filled by a nephrology nurse who is very experienced in hemodialysis care. The specific duties of the VAC vary because different programs have different needs and, therefore, different roles for the VAC. Some programs are directed by surgeons who do all the vascular access creation/placement. In some academic programs, access care is dictated by the hospital CQI program or the nephrology division. Some large outpatient dialysis provider organizations have coordinators covering several dialysis units. The goal of the role, however, is the same for all—better patient outcomes through organization and consistent application of best practices!

**MY EXPERIENCE AS A VAC**

As part of the nephrology division faculty for a large academic medical center program, my role included:

- management of the day-to-day vascular access needs for more than 350 outpatients in five dialysis units.
- organization and ongoing oversight of the weekly “shunt” clinic. This clinic was part of the vascular surgery program. All referrals of new chronic kidney disease (CKD) patients as well as established dialysis patients came to this clinic for access assessment including ultrasound vessel mapping. The surgical preparatory assessment as well as postoperative assessments were done through this clinic.
- coordination of patient visits for vascular access diagnostics such as venograms, shuntograms, and ultrasound mapping. (As a nurse practitioner, I also had prescriptive authority and so could order diagnostics and procedures such as angioplasty and thrombectomy. In cases where patients had contrast allergies, I could also prescribe the premedication. This prescriptive authority is not a prerequisite to the role but it greatly facilitated the care of the patient.)
- organization and management of a vascular access conference bimonthly with surgeons and interventional radiologists to review all the cases of access complications. A future plan of care was documented at this time for each patient based on the findings. I was responsible for communicating this to the nephrologist and the dialysis unit.
- assessing and treating inpatients with access problems as per consultation.
- educating the incoming renal service staff on a monthly basis. I gave slide presentations and demonstrated for them various items of vascular access technology such as catheters and graft materials.
- participating in CKD patient education to teach newly diagnosed patients about vascular access as part of the hemodialysis option for kidney replacement therapy.
- attending the nephrology division journal club and weekly conference to update them on vascular access issues.

Other expectations of my role as VAC included:

- being the vascular access resource person/contact (in many publications, the VAC is described as being the “go to” person; being the point of contact was an essential and pivotal part of the role) for:
  - medical center staff,
  - referring nephrologists and primary care physicians,
  - vascular access industry representatives,
  - the government oversight body, Network 6.
- participating in vascular access research in all capacities.
- authoring papers and making presentations.
- database “management”.
- coordinating the CQI process.

What is essential to fulfilling this role? My experience showed me that, primarily, it is the commitment to the concept of access advocacy. This is best explained by the governing principle of doing “what is best for the patient”. I found that access advocacy:

- promotes assertive communication with colleagues. (As a nurse trained in the British system, I was taught to not make recommendations to, or question, a physician (judgment). In this role, when I realized I needed to do so, it caused me a great deal of anxiety until I understood that we were all responsible to the patient and must do what was best for him/her.)
- dictates persistent patient and staff education (not nagging).
- drives the relentless search for innovative solutions.
- reinforces the use of the patient care process (through CQI).
- is always about patient-centered care [4]. To provide patient-centered care is “to identify, respect, and care about patients’ differences, values, preferences, and expressed needs; relieve pain and suffering; coordinate continuous care; listen to, clearly inform, communicate with, and educate patients; share decision making and management; and continuously
advocate disease prevention, wellness, and promotion of healthy lifestyles including a focus on population health.” (Institute of Medicine definition).

To aid the VAT and the dialysis unit staff, I derived the following basic model vascular access algorithm to be followed for each patient:
1. Early referral from nephrologist (as soon as glomerular filtration rate < 30 mL/min).
2. Assessment including ultrasound vessel mapping.
3. Referral to surgeons for assessment/plan.
4. Access creation.
5. Postoperative follow-up.
6. Ongoing monitoring.
7. Troubleshooting/referral for appropriate care of complications.
8. CQI process.

And the VAC model responsibilities to ensure the algorithm was followed were to:
- Assess new and established patients’ vascular access status and needs, and organize appropriate interventions as per nephrologist’s orders.
- Educate patients, families, and staff in all phases and aspects.
- Interact with dialysis staff (ideally the primary nurses/in-center vascular access nurse manager) to ensure ongoing access monitoring and surveillance.
- Oversee data collection and management.
- Organize and maintain CQI process that involves all members of the vascular access collaborative team.

The ideal VAC should possess the following personal and professional attributes to fulfill this role. He/she must be a:
- patient advocate,
- teacher (of patients and colleagues),
- liaison (a communicator extraordinaire),
- manager (CQI),
- researcher,
- collaborator,

and be:
- flexible (scheduling and priority shifting),
- mobile (be where the patient is),
- assertive,
- accountable,
- dedicated to, and for, the role.

Many publications in the past decade have attributed the success of the VAT to having a “dedicated” vascular access coordinator. I may be belaboring the point, but not only is it essential that this person be committed to the role, they must be dedicated in the sense that this is their only role. It is difficult on a day-to-day basis to know how the day will be filled, and it may be very tempting to assign this person other duties. My experience has taught me that there was always essential catch-up work to be done if I was having a “quiet” (no beeper or phone interruptions) day.

**It Takes a Team!**

To be successful as a VAC, a nurse must have, in addition to the prerequisite dialysis experience and all the qualities listed above, the full support and collaboration of his/her VAT. The Institute of Medicine (2003) recommends that in order to provide patient-centered care, we must “work in interdisciplinary teams—cooperate, collaborate, communicate, and integrate care in teams to ensure that care is continuous and reliable”. Who are the other team members? At a minimum, there should be a:
- nephrologist (in the US, many nephrologists employ nurse practitioners and/or physician’s assistants who they supervise to assess, diagnose and treat in their stead);
- surgeon;
- interventionalist;
- hemodialysis nurse vascular access manager.

The nephrologist is frequently the VAT leader, and he/she sets the example for the team in access creation and continuity of care through:
- early vein preservation (as soon as CKD is diagnosed) of both peripheral and central veins.
- early referrals to nurse educators and surgeons.
- strong recommendations for appropriate access selection to the patient and team.
- ensuring post procedure follow-up and ongoing oversight of access adequacy and care.
- close communication with the VAC.
- chairing the monthly CQI meetings.

The surgeons and their nursing and technical staff have a role as vascular access advocates through:
- creating/placing an access that will be more than adequate for flow for the longest time and with the fewest complications during that time.
- diagramming new accesses and clearly labeling the location of the arterial anastomosis and direction of flow.
- communicating specific access orders directly to the hemodialysis nurses.
- visiting the dialysis units to give patient and staff education and to familiarize staff with the surgeon’s role and point of view.
- being readily accessible for consultation on issues such as wound healing, cannulation, steal syndrome, and stenosis.
I found that it was essential to cultivate good working relationships with these nurses and technicians as it was frequently with them that I would need to coordinate procedures and tests as well as to communicate with the surgeon through them.

The interventionalists and their nursing and technical staff (both nephrology and radiology) are essential for the maintenance of vascular access through:
- diagnostics and procedures to improve or restore access flow.
- making access thrombectomy a priority to prevent catheter placement.
- sending reports of procedure with findings, recommendations, and catheter lumen volumes (if appropriate).
- communicating specific access orders directly to the hemodialysis nurses.
- visiting the dialysis units to give patient and staff education and to familiarize staff with the role of the interventionalist.
- being readily accessible for consultation on issues such as dysfunctional catheters, decreased blood flow rates, increased intra-access pressures and difficulties with cannulation.

The hemodialysis nurse manager should either assume the role or appoint a nurse in the hemodialysis unit to be the facility vascular access manager to be responsible for interfacing with the VAC. All nurses and technicians are responsible for day-to-day consistency of the vascular access care process and patient education, including:
- intelligent, knowledgeable access assessment at each treatment;
- performing access surveillance as per facility protocol;
- using strict aseptic technique and all dialysis precautions;
- documenting all assessment and access interventions;
- reporting all abnormalities and complications to their nurse manager and/or the VAC;
- encouraging vein preservation to patients and removal of catheters if possible.

Patients and their families must be taught to be their own vascular access advocates by:
- including them in the discussions for decision making at their level of comprehension;
- making written materials and videos easily accessible;
- teaching them how to assess and protect their access;
- helping them understand the importance of keeping appointments with the VAT to create and/or maintain vascular access;
- educating them about new products and techniques such as self-cannulation;
- and, ultimately, when you have done all you can with education, respecting the fact that it is their lives, their bodies, their time, and their choice!

**WHAT IF THERE ARE NO MORE CHOICES?**

End-stage vascular access is a disease condition that is essentially terminal in the end-stage renal disease patient because of irreversible damage to the vasculature necessary to support blood flows for adequate hemodialysis. At this point, patient survival depends on the ability to do peritoneal dialysis or receive a kidney transplant. The VAT is faced with a dilemma especially when this is a knowledgeable, sentient patient who has developed collateral veins sufficient to maintain essential circulation and has the will to live (or his family is not ready for him to die). In the US, there is no such thing as an emergency transplant, and it is highly unlikely that the patient has the vasculature for allograft placement or is generally healthy enough to withstand the immunosuppression of a transplant. Frequently, this person has also failed peritoneal dialysis at this juncture.

A referral for consultation with the palliative care team is frequently the only real care option at this point. Hopefully, the patient has an advance directive that addresses this contingency. Certainly, the VAT needs to support this patient and family in dealing with this dilemma. It is likely that the VAC is the person on the team who is most familiar with, and to, this patient with regard to his vascular access status. So it is very appropriate for her to help coordinate the referral and interact with the palliative care team during the transition of care and even through the dying process.

**THE VAC AND THE CQI PROCESS**

Ensuring that each patient at risk has an advance directive that includes the possibility of end-stage vascular access is part of the CQI process that the VAT conducts in conjunction with the hemodialysis team. Again, it is the VAC who is the liaison between the care teams and who communicates vascular access events and status. Every patient should have a vascular access plan in place even when the current access is complication-free. In order to do this efficiently, the CQI process for the VAT will include vascular access data collection of:
- vascular access history;
- current access type and site;
- average flow rates per treatment;
- average blood volume processed;
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- average arterial and venous machine pressures;
- access monitoring and surveillance data;
- laboratory results associated with adequacy such as urea reduction rates and Kt/V;
- number and type of cannulation events;
- number and type of dysfunction events;
- number and type of interventions to correct events, such as
  - recannulation,
  - catheter placement,
  - referral to interventionalist or surgeon,
  - instillation of lytic,
  - prompt diagnosis of bacteremia by positive culture,
  - antibiotic therapy.

The VAT should meet at least monthly to:
- review individual and aggregate facility data and plan;
- track and act upon trends and events that predict dysfunction;
- identify root causes for events in both the individual and facility;
- evaluate interventions and their outcomes;
- review current literature for vascular access associated research and recommendations;
- set goals to improve outcomes.

CONCLUSION

The newly appointed VAC has an exciting yet challenging professional role. The primary issue he/she must deal with is adapting the role to meet the needs of a particular patient population and understanding the current infrastructure to determine what changes must take place to meet those needs. Usually, this is a role without an existing on-site model, so the VAC needs to be resourceful to create this unique role by networking with other VACs and by seeking online and printed resources of which there are now quite a few.

It is important that the VAT and VAC set realistic goals to begin with. Again, these will depend on the needs of the patients and the resources that the program is willing to invest to meet those needs. It is very easy to overestimate the amount of time the VAC will have based on the somewhat nebulous nature of the workload. Cultivating collaborative relationships where there once existed competition can be very time-consuming and delicate work. It was my experience that I filled a need of a magnitude that our program was not even aware of. And the role I created quickly required resources such as an efficient database and data manager so that I could fulfill the nursing aspects. Yes, it is an investment, but it is an investment that pays great dividends in patient quality of care; professional satisfaction for all the clinicians involved; and it does indeed save dollars [5,6].

My closing advice to any nurse accepting this very rewarding and challenging role is to never lose sight of the fact that the goal of everything the VAC does is “doing what is best for the patient” while having realistic expectations of the role for yourself and communicating that to your colleagues and your patients.

REFERENCES

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ADDITIONAL READING

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