

The KDOQI 2006 Vascular Access Update and Fistula First Program Synopsis

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ABSTRACT

The optimal care of patients with end stage renal disease on hemodialysis involves a multidisciplinary approach involving nephrologists, vascular surgeons, transplant surgeons and interventional radiologists. A collaborative effort by these groups of physicians was used to create the KDOQI guidelines and the Fistula First program, which have served as the template for the management of dialysis patients. This article will briefly review the recent updates for vascular access in the KDOQI guidelines and summarize the highlights of the Fistula First program.

KEYWORDS: Kidney Disease Outcomes Quality Initiative, Fistula First program, dialysis

Objectives: Upon completion of this article, the reader will be able to define the 2006 KDOQI updates for vascular access and the Fistula First program.

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KIDNEY DISEASE OUTCOMES QUALITY INITIATIVE

The National Kidney Foundation first published the Kidney Disease Outcomes Quality Initiative (KDOQI) guidelines in 1997. Included in this publication were clinical practice guidelines related to vascular access for patients requiring hemodialysis. The guidelines have since undergone two updates in 2000 and most recently in 2006. Additionally, the document has been expanded to 12 separate sets of guidelines, one of which is dedicated to vascular access. The 2006 update is based on studies and articles published between January 1997 and June 2005.¹

The guidelines address the management of vascular access in all patients requiring hemodialysis. The

issues range from patient evaluation prior to placement of hemodialysis access to long-term management of the hemodialysis access. The guidelines aim to achieve several goals, foremost among which are reducing morbidity related to vascular access and increasing long-term access function.¹

The 2006 publication has been reorganized into eight "guidelines," each of which are subdivided into multiple recommendations. Whereas in the previous iteration, evidence-based and opinion-based guidelines were differentiated, each recommendation in the current guidelines is qualified by a three-level grading system. The grades indicate either strong supporting evidence (A), moderately strong evidence (B), or weak evidence and/or opinion of the Vascular Access Work Group who

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reviewed the data (CPR). Cost analysis was not performed and did not influence the final recommendations.¹

The following is a brief outline of the eight KDOQI guidelines. These are, of course, not inclusive but serve to highlight the important principles as well as those recommendations that are strongly supported by evidence in the literature.¹

Guideline 1: Patient Preparation for Permanent Hemodialysis Access

- Patients with chronic kidney disease stage 4, defined as glomerular filtration rate (GFR) <30, should be informed of all treatment options.
- Upper extremity veins that may be used in the creation of venous access should not be used for venipuncture.
- AVFs should be created 6 months prior to initiating hemodialysis. Synthetic grafts should be placed 3 to 6 weeks prior to the initiating hemodialysis.
- Patients' history and physical exam should be reviewed with attention given to factors that may preclude or negatively impact a potential vascular access. For instance, patients with a prior central venous catheter or pacemaker should undergo evaluation of their central veins.

Guideline 2: Selection and Placement of Hemodialysis Access

- The radiocephalic fistula is the vascular access of preference followed by the brachiocephalic fistula, transposed brachiocephalic fistula, and lastly an arteriovenous synthetic graft.
- Long-term dialysis catheters should be avoided, particularly on the same side of a maturing venous access. Long-term femoral dialysis catheters should not be placed on the same side as a future renal transplant.
- Right internal jugular vein is the preferred site for tunneled cuffed venous dialysis catheters. Subclavian veins should be used only after all other upper extremity sites are exhausted.

Guideline 3: Cannulation of Fistulae and Grafts and Accession of Hemodialysis Catheters and Port Catheter Systems

- Proper techniques for skin preparation and cannulation of venous access are important in controlling infection, including the use of aseptic technique and regular changing of catheter dressings at dialysis.
- Vascular access sites should be examined visually, with a stethoscope, and by palpation. In this manner, a

stenosis or infection affecting the access site may be detected. An arterial steal syndrome may also be uncovered.

Guideline 4: Detection of Access Dysfunction: Monitoring, Surveillance, and Diagnostic Testing

- A monthly physical examination should be performed by qualified personnel.
- Grafts and fistulae should be regularly monitored for stenoses via quantitative measurement of flow within the vascular access, static venous dialysis pressures, duplex ultrasound, and/or physical examination.
- Patients should be referred for evaluation and treatment of vascular access when flow rates fall below 400 to 500 mL/min in fistulas (600 mL/min in grafts), when the static venous dialysis pressure to mean arterial pressure ratio is greater than 0.5, the arterial dialysis pressure to mean arterial pressure ratio is greater than 0.75, or if any other abnormal trends are noted during routine surveillance.

Guideline 5: Treatment of Fistula Complications

- Angioplasty should be performed if greater than 50% stenosis is present in either the arterial or venous limbs. Successfully treated lesions should have <30% residual stenosis.
- Aneurysms should be managed by avoiding cannulation of the aneurysm and by treating the postaneurysmal stenosis that is causing the aneurysm.
- If thrombosis is detected, thrombectomy should be performed as early as possible.
- Findings of ischemia should prompt referral to Vascular Surgery.
- Infections of surgically created vascular access should be treated as subacute bacterial endocarditis including 6 weeks of antibiotic treatment. Septic emboli warrant surgical excision of the vascular access.

Guideline 6: Treatment of Arteriovenous Graft Complications

- Central vein stenoses should be treated with angioplasty. Successfully treated lesions should have <30% residual stenosis.
- Stent placement should be considered if there is persistent >50% stenosis after angioplasty or if restenosis occurs within 3 months of angioplasty.
- Surgical revision should be considered if a lesion requires more than two angioplasty treatments within a period of 3 months.

Guideline 7: Prevention and Treatment of Catheter and Port Complications

- Catheter dysfunction is defined as flow rates <300 mL/min.
- Treatment options include catheter repositioning, thrombolytic therapy, and catheter exchange with or without fibrin sheath disruption.
- An infected catheter should be exchanged as soon as possible and does not require demonstration of a negative blood culture result.

Guideline 8: Clinical Outcome Goals

- An institution should aim to have >65% of its patients with a functioning fistula, and <10% of its patients using cuffed catheters for permanent dialysis access.
- Grafts and fistulas treated with angioplasty should have a primary patency rate of 50% at 6 months.
- The goal primary patency rate is 40% at 3 months after percutaneous thrombectomy of a graft.

FISTULA FIRST PROGRAM

When compared with grafts, AVFs have been demonstrated to have greater patency rates, lower associated morbidity and mortality, and decreased overall cost. In light of these well-documented advantages of AVFs, the AV Fistula First Breakthrough Coalition, comprised of multiple organizations including the Centers for Medicare & Medicaid Services, has endorsed the National Vascular Access Improvement Initiative (NVAII). The NVAII, known more colloquially as the Fistula First program, purports to increase the use of AVFs in the United States.²

When the program was founded in 2003, an estimated 33% of patients receiving hemodialysis had AVFs. The program has set a goal of 66% by 2009. To achieve this end, the coalition has put forth what they call *Change* concepts. At present, there are 11 such concepts or recommendations, which have been made by the coalition to increase the prevalence of AVFs in patients receiving hemodialysis. They are as follows²:

1. A continuous quality improvement (CQI) program should be instituted to investigate failed AV fistulas and patients with non-AVF access.
2. There should be timely referral to nephrologists who can initiate plans for AVF in appropriate patients.
3. There should be early referral to surgeons for evaluation and timely placement of AVFs.

4. Nephrologists should refer to surgeons willing and able to place AVFs.
5. Surgeons should conduct appropriate presurgical evaluation and use current techniques in placing fistulas.
6. Patients with AV grafts should be evaluated for possible secondary AVF placement.
7. Patients with catheters should be evaluated for AVF placement.
8. Dialysis staff should be well trained in cannulation techniques and protocols.
9. AVFs should be regularly monitored with timely referral to the appropriate specialist for failing AVFs.
10. Continuing education should be provided to all persons involved in the care of patients with AVFs including the patients themselves.
11. Data obtained through CQI should be regularly reviewed and evaluated.

These recommendations reiterate some of the concepts outlined in the KDOQI guidelines. They are complementary in that they endorse a collaborative effort among the many professionals involved in the care of hemodialysis patients, with each participant responsible for carrying out a portion of the KDOQI guidelines.

SUMMARY

Without a doubt, dialysis-dependent patients need a multidisciplinary team to manage the multiple issues related to the creation and maintenance of dialysis accesses. Each medical provider caring for these patients should be aware of and understand the KDOQI guidelines and the Fistula First program as these references are now the framework of how dialysis patients are cared for in the United States. The full details of these guidelines can be found at <http://www.kidney.org/professionals/kdoqi/index.cfm> and <http://www.fistulafirst.org/>.

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