

The following is a summary of the recently published K/DOQI Guideline 4 “Detection of Access Dysfunction: Monitoring, Surveillance, and Diagnostic Testing.”

Introduction:

Prospective surveillance of fistulae and grafts for hemodynamically significant stenosis, when combined with correction of the anatomic stenosis, may improve patency rates and may decrease the incidence of thrombosis.

The Work Group recommends an organized monitoring/surveillance approach with regular assessment of clinical parameters of AV access and HD adequacy. Data from clinical assessment and HD adequacy measurements should be collected and maintained for each patient’s access and made available to all staff. The data should be tabulated and tracked within each HD center as part of a Quality Assurance (QA)/CQI program.

Interpretation: It is no longer acceptable to not have a proactive surveillance program in place being conducted on a regular basis.

4.1 Physical examination (monitoring):

Physical examination should be used to detect dysfunction in fistula and grafts at least monthly by a qualified individual.

4.2 Surveillance of grafts:

4.2.1 Preferred:

4.2.1.1 Intra-access flow by using 1 of several methods... using sequential measurements with trend analysis.

4.2.1.2 Directly measured or derived static venous pressure by 1 of several methods.

Note: Vasc-Alert is a ‘derived static venous pressure’ device.

4.2.1.3 Duplex Ultrasound

4.2.2 Acceptable:

4.2.2.1 Physical findings of persistent swelling in the arm, presence of collateral veins, prolonged bleeding after needle withdrawal, or altered characteristics of pulse or thrill in a graft.

4.2.3 Unacceptable:

4.2.3.1 Unstandardized dynamic venous pressures (DVPs) should not be used.

4.3 Surveillance in fistulae:

4.3.1 Preferred:

4.3.1.1 Direct flow measurements.

4.3.1.2 Physical findings of persistent swelling in the arm, presence of collateral veins, prolonged bleeding after needle withdrawal, or altered characteristics of pulse or thrill in a graft.

4.3.1.3 Duplex Ultrasound

4.3.2 Acceptable:

4.3.2.1 Recirculation using a non-urea-based dilution method.

4.3.2.2 Static pressure, direct or derived.

4.4 When to refer for evaluation (diagnosis) and treatment:

4.4.1 One should not respond to a single isolated abnormal value. With all techniques, prospective trend analysis of the test parameter has greater power to detect dysfunction than isolated values alone.

Interpretation: Whatever method of surveillance is used, the results of each test should be charted over time.

4.4.2 Persistent abnormalities in any of the monitoring or surveillance parameters should prompt referral for access imaging.

4.4.3 An access flow rate less than 600 mL/min in grafts and less than 400 to 500 mL/min. in fistulae.

4.4.4 A venous segment static pressure (mean pressure) ratio greater than 0.5 in grafts and fistulae.

4.4.5 An arterial segment static pressure ratio greater than 0.75 in grafts.

The Clinical Practice Recommendations for Guideline 4:

4.1 Monitoring the access:

4.1.1 Access patency should be ensured before each treatment before any attempts to cannulate the access.

4.1.2 All caregivers, including fellows in training, should learn and master the methods for examining a vascular access.

4.1.3 Access characteristics, such as pulsatility and presence of thrill, as well as flow and pressure, should be recorded and tracked in a medical record and be available to all caregivers on the VAT.

4.2 Frequency of measurement is dependent on the method used:

- 4.2.1 It is not clear that access flow measurements performed at a monthly frequency provided sufficient data stability to make decisions. Until additional studies are performed to determine optimal frequency, more frequent measurements are recommended.

Interpretation: Testing methods that measure blood flow should be performed more than once a month, especially for grafts (see 4.3.1 below).

- 4.2.2 Static pressure measurements require less technology and should be made more frequently than flow measurements. Direct measurements of static pressure ratios should be made every 2 weeks. Less-direct measurements should be made weekly. Dynamic pressures, if used (see CPG 4.2.3), should be measured with each dialysis treatment, but derivation of a static pressure should be attempted, rather than using the raw numbers.

- 4.2.3 Measurement of recirculation is not recommended as a surveillance technique in grafts.

4.3 Frequency of measurement for access complications:

- 4.3.1 Thrombosis in fistulae develops more slowly than in grafts. Flow measurements performed at a monthly frequency appear to be adequate. Until additional studies are performed to determine optimal frequency, less frequent measurements are not recommended.

- 4.3.2 Because static pressure measurements are inherently less accurate in detecting access stenosis in fistulae, the frequency should not be less than in grafts. Direct measurements of static pressure ratios should be made every 2 weeks. Less-direct measurements should be made weekly. Dynamic pressures should be measured with each dialysis. Increased recirculation can indicate reduced effective blood pump flow, resulting in inadequate dialysis.

4.4 Diagnostic testing:

- 4.4.1 Characteristics of access (see CPR 4.1), as well as blood pump flow and pressure performance, should be recorded and tracked in medical records.

- 4.4.2 Data should be analyzed at least monthly to evaluate access dysfunction.

- 4.4.3 After intervention, the surveillance parameter should be restored to normal.

Interpretation: When a patient returns from intervention, the surveillance test in use should be performed to ensure that patency has been restored.

- 4.4.4 Data should be analyzed to improve success rates and ensure that interventions are properly assessed. For example, PTA and surgical revision rates, recurrence rates, and number of procedures should be systematically analyzed in a CQI process.

- 4.4.5 A multidisciplinary team should be involved.

- 4.4.6 Preemptive correction of hemodynamically significant stenosis should remain the standard of care.

Other interesting points made in the document:

“Low blood flow rate and loss of patency limit HD delivery, extend treatment times, and in too many cases, result in under-dialysis that leads to increased morbidity and mortality.” Page S211

Interpretation: Keeping the access open through surveillance and intervention improves the overall efficiency of dialysis which directly impacts the overall health of the patient.

“ (the access team’s) most important function is to work proactively to ensure the patient is receiving an adequate dialysis dose by maintaining access function and patency.” Page S211

“Unfortunately, arterial disease is not uncommon; access inflow stenosis occurs in one third of the patients referred to interventional facilities with clinical evidence of venous stenosis or thrombosis.” Page S214

“Access recirculation in grafts is a late manifestation of stenosis and a poor predictor of imminent thrombosis... For this reason, the Work Group no longer recommends recirculation measurements in grafts.” Page S216

“Optimal care of a particular patient requires individualization, and not rigid application of protocols.” Page S229

“...the likelihood of detecting a hemodynamically significant stenosis increases if the surveillance test is repeated frequently.” Page S229