

## Secondary AV Fistula in Patients with A-V Grafts

An effective strategy for increasing AV fistula Prevalence in AV graft patients is the planning and construction of AVF's in existing graft patients prior to graft failure. Although the patient's primary access may currently be a graft, all graft patients should be evaluated and considered (where feasible) for an AVF as their next permanent access (secondary AVF, SAVF).

Although evaluation for a secondary AVF may require bilateral vessel mapping to identify a suitable vein and artery for AVF construction, the simplest opportunity to convert a graft patient to a fistula patient, when present, is the conversion of an arterialized (mature) upper arm outflow vein of a forearm graft to a direct upper arm AV fistula. Such a conversion opportunity should be looked for and considered in all forearm graft patients (see "Sleeves Up" protocol below). AVF evaluation of graft patients should include an updated history relevant to vascular access, physical exam with tourniquet and vessel mapping if suitable vessels are not identified on physical exam. A secondary AVF plan should be documented in the chart and discussed with patient, family, staff, nephrologist and surgeon in anticipation of AVF construction on the earliest evidence of graft failure.

### **"SLEEVES UP" Protocol for conversion of forearm A-V graft to upper arm A-V fistula**

Purpose: to identify a suitable outflow vein for conversion from an AV graft to an AV fistula, in anticipation of secondary AVF construction by the surgeon.

1. Once a month, clinic rounds to include examination of the AV graft extremity to the shoulder, by rolling *sleeves up* (or removing shirt if necessary).
2. After upper arm is exposed to the shoulder, the hand or a tourniquet is used for light compression just below the shoulder, to see if the outflow vein of the forearm graft appears suitable for immediate use as an AVF. If this appears to be the case, (often this is the case if the cephalic vein is the outflow vein), the vein is evaluated by:
  - Referring patient for fistulogram (or Doppler study) to confirm that the outflow vein and draining system back to the heart is normal.
  - If fistulogram is normal, the vein is "tested" by cannulating the outflow vein with the venous needle only, for 2 consecutive dialysis sessions.
  - If both cannulation sessions are uneventful, the plan for surgical conversion from graft to upper arm fistula is discussed with patient, staff, nephrologists and surgeon—and documented in chart.
  - Staff follows patient until AVF conversion is performed.

The Fistula First workgroup recommends that the *timing* for SAVF evaluation be no later than the first signs of AVG failure by monitoring and surveillance or thrombosis, and that SAVF *surgery* take place no later than following the 2<sup>nd</sup> intervention for AVG stenosis or thrombosis. Any delay in conversion beyond this point is likely to result in loss of the window of opportunity for this AVF option, since further graft interventions, whether endovascular or surgical, are likely to damage or utilize the outflow vein, or the AVG will eventually be abandoned (usually after a failed intervention), resulting in a catheter and a new AVG in a different location.

If "sleeves up" evaluation does not identify a vein as being clearly suitable for conversion to an AVF, a Fistulogram or Doppler Ultrasound study should be ordered at the first signs of graft failure, both for diagnostic purposes as well as to check for suitability of the outflow vein (check to see if patient has already had a recent study, as many graft patients with thrombosis or evidence of failure will already have had a fistulogram that can be used as a mapping study). If a suitable basilic or cephalic outflow vein is identified but is too deep for safe cannulation, the plan for a transposition AVF should be discussed and documented—with the timing of the procedure to be based on evidence of graft failure and patient condition. All interventionalists should be notified that all contrast or ultrasound studies for AVG failure or thrombosis should include a report on the condition of the outflow veins and central veins with respect to the potential for SAVF construction.

Note: The Fistula First Work Group recognizes that not all patients are candidates for an AVF. However, in the absence of medical contra-indications, a patient who would otherwise be considered a candidate for an AVF should not be excluded unless a complete examination, including vessel mapping, has been performed, and all available AVF surgical options have been considered.

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