

Autologous AVF Algorithm

Notes to Algorithm

Patient requiring chronic renal replacement therapy (RRT) / possible Hemodialysis

AVF assessment / surgical consult--ideally prior to stage 4 CKD (GFR<30)--or stage 3 CKD (GFR<60) in diabetics:

- History
- Physical exam
- Vessel mapping if suitable vessels not identified on Physical Exam (P.E.)--see "mapping protocol"

Suitable vessels for AVF on P.E. or mapping? (and AVF not medically contra-indicated)

NO
AVG or Tunneled Cuffed Cath or PD

AVF Construction Options:

- Forearm**
 - Distal: radial-cephalic, transposed radial-basilic
 - Proximal:
 - . radial-(or brachial-)cephalic (simple direct or transposed loop)
 - . radial-(or brachial-)basilic (simple direct or transposed loop)
 - . radial-median antebrachial (retro- and/or antegrade flow)
 - Antecubital: Gracz, other
- Arm**
 - brachial-cephalic (simple direct or transposed)
 - brachial-basilic (transposed only/1- or 2-stage)
- Thigh**
 - femoral-saphenous (transposed or translocated), other
- Other**
 - Translocations
 - Retrograde constructions: arterial anastomosis proximal / AVF flow distal (retrograde)
 - Composite / creative constructions
 - "Blind" constructions (planned 2-stage procedure where no definable AVF vein identified at 1st stage)

Mandatory 4-week post-op assessment

Is AVF maturing adequately?

NO
Doppler study or fistulogram/remedial action as indicated

YES
Attempt Cannulation @ 8-12 wks based on exam & MD orders

Proceed to "Protocol for Initial Cannulation"

Ideally, regardless of RRT modality contemplated, patient would be referred for autologous AVF unless patient not considered a candidate for HD or AVF based on medical/other reasons.

- History: diabetes, catheters, PICC lines, pacemaker, PVD, extremity swelling, surgery, trauma,...
 - P.E.: Artery: pulses, BP, status of peripheral circ./Allen test
Vein(with tourniquet): soft, straight, superficial,>2.5mm
 - Mapping: Artery: >2.0mm I.D.,no calcifications or stenosis, normal flow & velocity wave forms.
Vein:(exam with & w/o tourniquet)> 2.5mm I.D. with tourniquet, compliant, distensible>50%, continuity with deep system, no stenosis/webs, no C.V. stenosis.
- Note:** 1. Mapping ideally performed by Doppler ultrasound in pre-ESRD patients, but alternate options in specific cases can be considered (i.e. dilute contrast, gadolinium and/or CO2).
2. Most patients are AVF candidates if mapping performed.

- AVF selection based on upper extremity with best vessels, regardless of dominance / distal-to-proximal planning

- If upper extremity AVF not feasible, AVG may be considered (with plan for future 2° AVF conversion evaluation) before considering lower extremity AVF (due to higher complication rate and limb threat related to latter)

Note: special attention given to limiting size of arterial anastomosis (<5mm) in pts. at high risk (esp. diabetics) of developing significant ischemia/steal—esp. with high-flow AVF's.

- Category 4/"Other" procedures reserved for patients with limited options, depleted access sites or extenuating/complex medical issues

Most failing AVF's can be identified on physical exam alone by 4 wks.

Note: Also assess post-op and weekly for ischemia/steal

Most early AVF failures can be salvaged if identified before thrombosis occurs.

Some AVF's, esp. transposed, may take considerably longer to mature.

- Note:** 1. If AVF looks good/has good flow but infiltrates, rest AVF x 2 wks.—if persists, rest another 2 wks.—if persists, re-exam and fistulogram p.r.n.--with remedial action/ interim access as indicated.
2. If AVF patent but unable to cannulate or dialyze adequately by 12 wks.(AVF failure), exam/fistulogram and remedial action as indicated.

ALERT:

1. Only experienced AVF cannulators perform initial cannulations
2. AVF may be cannulated earlier than 8 wks per MD orders