Autologous AVF 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**

YES

AVF Construction Options:

1. **Forearm**
   - Distal: . radial-cephalic
     . transposed radial-basilic
   - Proximal:
     . proximal radial-(or brachial-)cephalic (simple direct or transposed loop)
     . proximal radial-(or brachial-)basilic (simple direct or transposed loop)
     . proximal radial-median antebrachial (retro- and/or antegrade flow)
   - Antecubital: Gracz variation
2. **Arm**
   - brachial-cephalic (simple direct or transposed)
   - brachial-basilic (transposed only/1- or 2-stage)
3. **Thigh**
   - femoral-saphenous (transposed or translocated saphenous v.)
   - femoral-femoral (transposed straight or loop)
4. **Ankle :** posterior *(or anterior*) tibial-saphenous
5. **Other**
   - Translocations
   - Retrograde/reverse flow constructions: arterial anastomosis proximal /AVF flow distal (retrograde flow)
   - Composite / creative constructions
   - "Blind" constructions (planned 2-stage procedure where no definable AVF vein conduit 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"*

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

Notes to Algorithm

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's 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, 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 2º 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.

- Ankle AVF in select pts. with good pulses / non-mild diabetes / no PVD (minimize risk of steal / ischemia)

- Category 5/"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 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.