

## Fistulas for Dialysis Access: The Challenge of Preservation, Creation, Maturation, and Cannulation

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## Outline

- the mandate for more fistulae
- guideline for vein preservation
- who can have a fistula?
- screening diagnostics
- surgical techniques for fistula creation
- post-op education and care
- maturation

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## Outline

- cannulation
  - » who - the case for expert cannulators or self-cannulation
  - » how - sticking tips
- troubleshooting complications
  - » diagnostics - mapping by ultrasound & venogram
  - » interventions
    - angioplasty
    - surgical revision (tying off collaterals, revising inflow)

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## Vein preservation for AV access - G7

- arm veins should be preserved regardless of arm dominance - dorsum of the hand should be used whenever possible in CRF patients
- CRF = Scr > 3 mg/dl
- patient and staff education re preservation & medic alert bracelet worn
- AVOID subclavian vein catheterization

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## Selection of Access Type and Site -G3

- Order of preference
  - » 1. radial-cephalic primary AV fistula
  - » 2. brachial-cephalic primary AV fistula
  - » 3. transposed brachial-basilic vein fistula (or popliteal-saphenous)
  - » 4. PTFE graft

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## Timing of Access Placement - G8

- primary AV fistula
  - » CrCL < 25 ml/min
  - » Scr > 4 mg/dl
  - » or within 1 year of anticipated need
- PTFE grafts should be placed 3-6 weeks prior to anticipated need for dialysis
- catheters should not be placed till dialysis is needed

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## Vascular Access Selection

- Goal of Vascular Access
- Demographic variables affecting access selection
  - » age
  - » race
  - » sex
- Comorbidities &
- Access History

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## Arterio-Venous Fistulae

- criteria for fistula creation
  - » adequate, palpable veins
  - » healthy arteries - Allen's test or doppler studies to assure adequacy of flow to hand
  - » good cardiac output
- sites of creation
  - » wrist
  - » elbow
  - » thigh

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## Types of Fistulas

- Simple
- Vein transposition
- 2 step - simple then transposition
- superficialization of veins by surgical removal of tissue between skin and vein

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## Arterio-venous fistulae

- basic care
  - » maturation exercises
  - » protecting the access
    - no IV sticks
    - no BP cuff
    - no tight clothing or jewelry that "binds"
    - washes arm predialysis
    - holds own sticks
    - removes pressure dressings ASAP

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## Arterio-venous fistulae

- complications
  - » inadequate maturation
  - » repeated infiltration
  - » steal syndrome or nerve damage
  - » pseudoaneurysms/one site-itis
  - » thrombosis
  - » infection

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## Cannulation Challenges - Fistulas

- Anyone can have a fistula - but will there be an outflow vein that is reasonable to cannulate?
  - » Reports of vessels that bleed excessively post-cannulation - ? Increased fragility from long term steroid use?
  - » Straight as a dog's hindleg?
  - » Deep! Deep! As the ocean?
  - » Now you see it - now you don't!
  - » I can see it but can't get to it - the ulna-basilic!

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## The Marginal Outflow Vein

- Use a single needle to return blood initially
- Aggressively treat infiltrations
- Conservatively recannulate
- Get ultrasound mapping for depth and size
- Get fistulagram if generalized swelling occurs
- Refer back to surgeon for revision options

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## Limited Cannulation Sites

- Can result from:
  - » tortuous outflow vein
  - » Brachio-cephalic fistula short/deep outflow
  - » less than optimal graft placement
  - » port placement
- Can be optimized with:
  - » button hole technique
  - » good skin care

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## Who is the Cannulator?

- Will just anyone do?
- Would you let that person stick you or yours?
- What training should you look for?
- Is there a role for dedicated cannulators?
- Has the time for self-cannulation arrived?

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## Variability of Staff Experience

- High staff turnover with many new staff having NO cannulation experience!
- Do technical staff being trained to cannulate have a basic understanding of anatomy & physiology?
- Many staff trained to cannulate PTFE try to cannulate outflow veins with same technique
- Are cannulation challenges assigned to appropriate expertise?

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## Lesley's sticking tips

- carefully inspect, feel, and listen to access
- thoughtfully choose BOTH needle sites before sticking - take your time
  - » which side/end is arterial?
  - » where was the previous stick?
  - » is there room above to stick again should it blow?
  - » where will the tip of the needle be?
  - » how deep is the graft?
  - » ? needs local - lidocaine versus Emla cream

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## Lesley's sticking tips cont.

- Remember
  - » needles don't bend - accesses do
  - » rotate sites
  - » take your time
  - » listen to your patient - he's seen the best and the worst and knows his access best
  - » flip needles ONLY if flow is poor
  - » tape needles securely not tightly

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## Lesley's sticking tips cont.

- Remember
  - » take your time
  - » fistulas and grafts are of different composition
  - » ALWAYS use a tourniquet for a fistula
  - » use a tourniquet for a "mushy" graft
  - » fistulas not as tough as PTFE - be gentle!
  - » if at first you don't succeed - get expert help
  - » stick unto others as you would have them stick you