CATHETER REDUCTION

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Objectives

- Discuss tools/techniques proven to improve AVF rates & decrease catheter rates
- Implement a change process in your facility to target catheter reduction in eligible patients.
CATHETER REDUCTION
FROM AN INTERVENTIONAL
RADIOLOGIST’S PERSPECTIVE
Catheter Reduction

aka....

Increase Fistula Rates
Seven Ways to Catheter Reduction

- Patient Education
- Vein Preservation
- Pre-op Access Planning
- Surgeon/Interventionalist Choice
- Fistula Maturation
- Access Maintenance/Surveillance
- Clotted Access
Seven Ways to Catheter Reduction

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Patient Education

- Everyone’s Job
- Patients have fears, concerns, and misconceptions
  - “Will I get those bumps on my arm”
  - “I like to wear short sleeves.”
  - “I have a permanent catheter, why do I need a fistula?”
  - “I’ve been told I have small veins.”
  - “They’ve tried to place a fistula and it failed.”

- Stress the positives
Infection Rate

Risk of Infection with Various Access Types

- Nontransposed Fistula
- Transposed Fistula
- Graft
- Catheter
Education

Relative Risk of Death by Access Type

- **Diabetics**
  - Catheter: 1.91
  - Graft: 1.64
  - Fistula: 1

- **Non-Diabetics**
  - Catheter: 1.16
  - Graft: 1.12
  - Fistula: 1
Seven Ways to Catheter Reduction

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Vein Preservation

- **Central Veins**
  - Subclavian Vein
  - Brachiocephalic Vein

- **Peripheral Veins**
  - Cephalic Vein
  - Basilic Vein
  - Brachial Vein
CONCLUSIONS: There is a relatively high rate of venous thrombosis associated with PICCs, particularly cephalic thrombus. Because of the high rate of thrombosis associated with these catheters, an alternative mode of access should be considered in current or potential hemodialysis patients. All patients with a history of PICC line placement requiring dialysis access should undergo upper extremity venography prior to the placement of permanent access.
Incidence of central vein stenosis and occlusion following upper extremity PICC and port placement.

The purpose of this study was to determine the incidence of central vein stenosis and occlusion following upper extremity placement of peripherally inserted central venous catheters (PICCs) and venous ports.

Catheter caliber showed no effect on the subsequent development of central vein abnormalities. Patients who developed new or worsened central vein stenosis or occlusion had significantly \( p = 0.03 \) longer catheter dwell times than patients without central vein abnormalities.

In order to preserve vascular access for dialysis fistulae and grafts and adhere to Dialysis Outcomes Quality Initiative guidelines, alternative venous access sites should be considered for patients with chronic renal insufficiency and end-stage renal disease.
Vein Preservation

- This is important for patients who are on dialysis, but as healthcare workers, we must think about this when caring for all patients.
Seven Ways to Catheter Reduction

- Patient Education
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Pre-op Access Planning

- Prior Failed Access
- Prior Catheters
  - Prior dialysis catheters
  - Prolonged Hospitalization/s
- Poor Venous Access
  - IVDA
  - Elderly
  - “I have small veins”
Seven Ways to Catheter Reduction

- Patient Education
- Vein Preservation
- Pre-op Access Planning
- **Surgeon/Interventionalist Choice**
- Fistula Maturation
- Access Maintenance/Surveillance
- Clotted Access
Surgeon/Interventionalist Choice

- “Not all doctors are created equal”
  - Familiarity with dialysis access
  - Number of dialysis access procedures
  - Success rates
  - Bedside manner
    - Willingness to educate/explain to patients
Seven Ways to Catheter Reduction

- Patient Education
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Promoting Access Development

KDOQI Guideline 5.1.2

“A program should be in place to detect early access dysfunction, particularly delays in maturation. The patient should be evaluated no later than 6 weeks after access placement.”
Fistula Maturation

- Fistula should be mature/accessable approximately 4-6 weeks from creation
- Refer them earlier
  - Decreased or no thrill
- New fistula maturation techniques
Fistula Exercise Procedure
Technology
Would you cannulate this fistula?
Salvage of immature forearm fistulas for haemodialysis by interventional radiology.
Aggressive treatment of early fistula failure.
Impact of secondary procedures in autogenous arteriovenous fistula maturation and maintenance.
Failure to Mature
One Month F/U
Failure to Mature
Several Months Later
Before & After
Failure to Mature
After Day 1
One Month Later
Before & After
Seven Ways to Catheter Reduction

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- **Access Maintenance/Surveillance**
- Clotted Access
Vascular Access Surveillance

KDOQI Clinical Practice Guideline 4.4.6

“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.”
Vascular Access Surveillance

Guideline 4.1:
Physical Examination of fistulae and grafts performed at least monthly.

Routine monitoring and surveillance gives patients and caregivers the opportunity to plan interventions, avoiding emergency procedures, or worse, access abandonment.
Vascular Access Surveillance

Guideline 4.2:

Surveillance for stenosis includes direct flow measurements, or physical findings such as:

1. arm swelling
2. collateral vein development
3. prolonged bleeding
4. changes in pulse/thrill
Warning Signs

Signs of stenosis include:
- changes in thrill (loss of detection in an area)
- presence of pulse (eg, throbbing)
- low (or decreasing) dialysis flow rates
- high dynamic venous pressure
- low arterial pressure
- prolonged bleeding when needles removed
Vascular Access Maintenance: Grafts

- After percutaneous thrombectomy, patency should be 40% at 3 months (KDOQI 6.8.2)

- After successful PTA, about 50% grafts have blood flow decreasing to initial baseline within 3 months (Murray, et al. Am J Kidney Dis 2001; 37:1029-38)
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Vascular Access Maintenance: Fistulae

- Pre-emptive PTA is indicated for fistulae with greater than 50% stenosis in either venous outflow or arterial inflow, in conjunction with clinical abnormalities (KDOQI 5.3)
- Despite PTA, the vessel wall may collapse or recoil after removal of the balloon
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Clotted Access

- Fistulas can be declotted
- Avoid centers/hospitals who place catheters and reschedule the declot
- Choose a center that will spend the time
In Conclusion...

- Most of what I told you is common sense
- “To have a higher fistula rate, you have to place less catheters”
- “Save the Subclavians”
- Plan Ahead
- A squeezeball is not the only way to mature a fistula
- Take care of what you have
- Patient education is paramount and is everyone’s job