AV Access Aneurysm and Pseudoaneurysm Management
Flow Diagram 17
AV Access Aneurysm or Pseudoaneurysm (PSA)

Clinical indicators for management

**Urgent**
- Ulcerated or necrotic skin
- Unable to be pinched

**Non-urgent**
- Cannulation difficulty due to aneurysm/PSA
- High output congestive heart failure due to aneurysm/PSA
- Disfigurement impacting patient satisfaction/QoL
- Infection**

AV Fistula Treatment Options
- Primary
  - Aneurysmorrhaphy (autologous bypass vs. plication)
- Secondary
  - Graft interposition
  - +/- Angioplasty for outflow stenosis (in conjunction with inflow reduction if high flow rates are present)
  - +/- Stent graft as temporizing measure with mandatory revision to follow
- Ligation (+/- excision of aneurysm)

AV Graft Treatment Options
- Segmental bypass
  - +/- Angioplasty for outflow stenosis
  - +/- Stent graft+ as temporizing measure with mandatory revision to follow
- Ligation

* Carefully consider bleeding risk. Urgent or emergent surgery may be necessary if clinically indicated.
** See Flow diagrams 16a and 16b for infected AV access diagnosis and management
+ If stent graft used as temporizing measure, must avoid cannulation zones

C-PG 17
Table 17.1. Physical Examination Findings That Are Clinically Relevant to Differentiate Between Aneurysm/Pseudoaneurysm That Do Not Require Urgent Intervention and Those of Urgent Concern

<table>
<thead>
<tr>
<th>Physical Examination Findings</th>
<th>Non-urgent: Monitor Closely Aneurysm/Pseudoaneurysm</th>
<th>Urgent: Rapid Attention Aneurysm/Pseudoaneurysm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Not enlarging</td>
<td>Enlarging</td>
</tr>
<tr>
<td>Overlying skin</td>
<td>Can be pinched easily (supple, mobile skin)</td>
<td>Thin, shiny, depigmented</td>
</tr>
<tr>
<td>Skin erosion</td>
<td>None</td>
<td>Ulcers, scabs</td>
</tr>
<tr>
<td>Arm elevation sign</td>
<td>Collapses</td>
<td>May not collapse</td>
</tr>
<tr>
<td>Bleeding from puncture sites</td>
<td>Uncommon</td>
<td>Often prolonged</td>
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AV Access Aneurysms/PSA – Recognition and Diagnosis

- Check AV access for aneurysm/pseudoaneurysm at each dialysis session
- Educate patients on emergency procedures for aneurysm rupture
- When clinical findings suggest an AV access aneurysm to be at risk of complications, obtain a proactive surgical assessment
- Obtain an emergent surgical assessment and treatment for serious AV access aneurysm/pseudoaneurysm complications such as erosion or hemorrhage
- Consider corroborating physical exam findings with duplex ultrasound to determine size, presence of stenosis/thrombosis, access flow, and characteristics of arterial inflow and venous outflow
AV Access Aneurysm/PSA Management

- Asymptomatic aneurysm/PSA do not need definitive treatment (CPG 17.5)
- Avoid cannulation of access segments that involve the aneurysm/PSA, if alternative cannulation sites are available (CPG 17.6)
- If alternative cannulation sites are not available, cannulate at the sides or base of the aneurysm/PSA (CPG 17.6)
- In asymptomatic aneurysm/PSA, obtain appropriate imaging of the arterial inflow and venous outflow to assess volume flow or stenosis that may need to be corrected before definitive treatment (CPG 17.7)
- Symptomatic, large or rapidly expanding aneurysm/PSA should be surgically managed (CPG 17.8)
- Anastomotic aneurysm/PSA typically need surgical management (CPG 17.9)
AV Access Aneurysm/PSA Definitive Treatment

Definitive treatment of symptomatic, large or rapidly expanding AV access aneurysm/PSA is open surgical treatment with the specific approach determined by local expertise

Under special circumstances (e.g. patient contraindication to surgery or lack of surgical option), stent grafts may be an alternative treatment for AV access aneurysm/PSA but the risk of infection must be carefully considered and cannulation over the stent graft must be avoided whenever possible
Prevention of AV Access Aneurysm/PSA

- Prevent AV access aneurysms and pseudoaneurysms by using appropriate cannulation techniques (e.g. avoid "onesiteitis")

Properly conducted Rope Ladder cannulation is the best way to avoid aneurysms/pseudoaneurysms

CPG 17.13

Poor constant site cannulation can lead to aneurysms/pseudoaneurysms