Interventional Access from the Floor

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When is the time to get Interventional Help?

- Abnormal Physical Exam
- Problem with cannulation
- Problems with maintaining flows during dialysis
- Problems after Dialysis, e.g. prolonged Bleeding
- Problems with Kt/V or URR
- Problems with surveillance parameters, e.g. Transonic results
- Patient's complaints e.g. pain, numbness

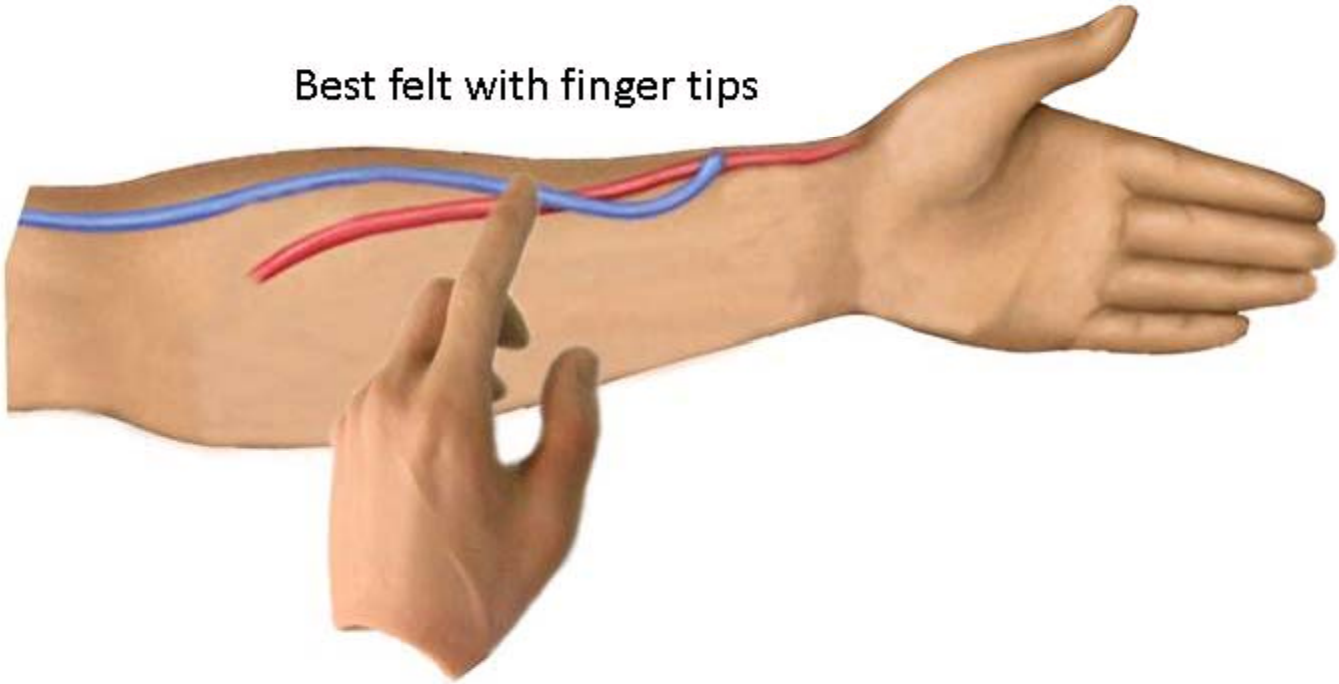
Physical Exam

- Examine for:
  - Clotted access
  - Infection
  - Hematomas / Infiltrations
  - Aneurysms
  - Skin quality over the aneurysms
  - Buttonholes

Exam Basics

- Pulse
- Thrill
- Bruit

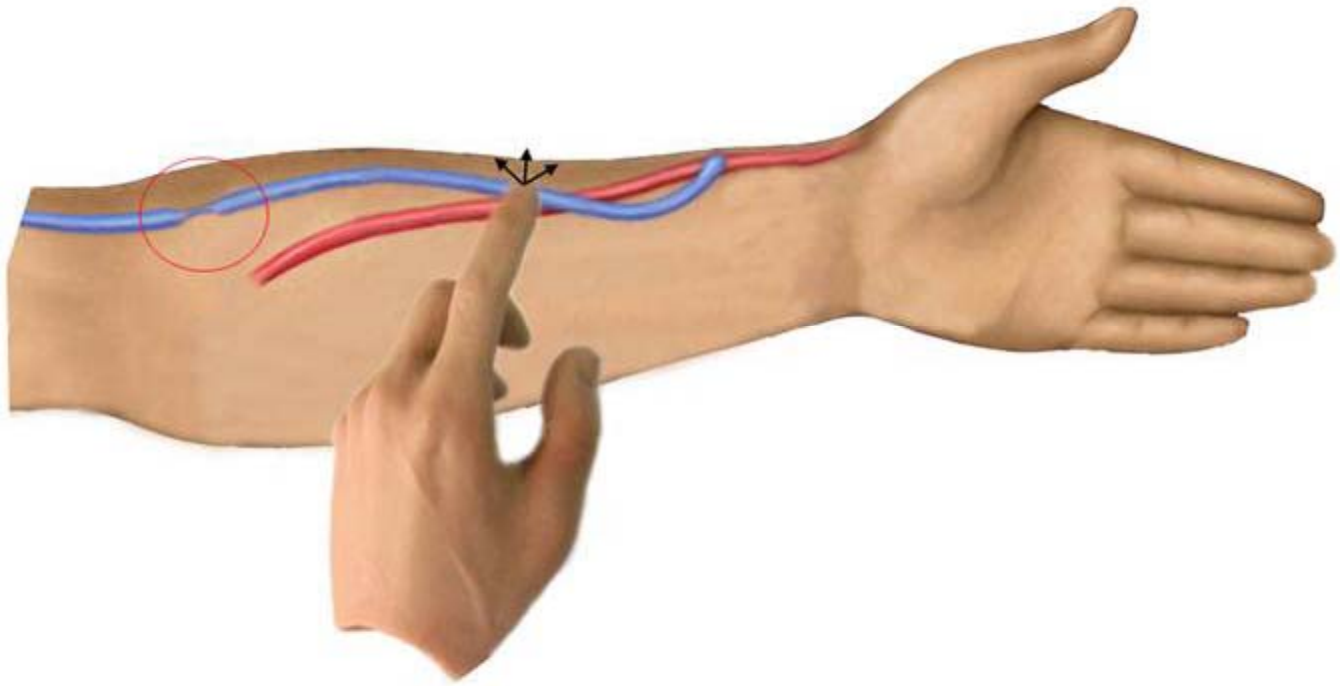
Pulse



Normally:

There should be very little pulse in an arteriovenous access

It should be soft and compressible



Stenosis:

With an increase in downstream resistance as with a stenotic lesion, a definite pulse will develop

The intensity of this pulse will be directly proportional to the severity of the stenosis

Its presence indicates increased resistance to flow

Thrill

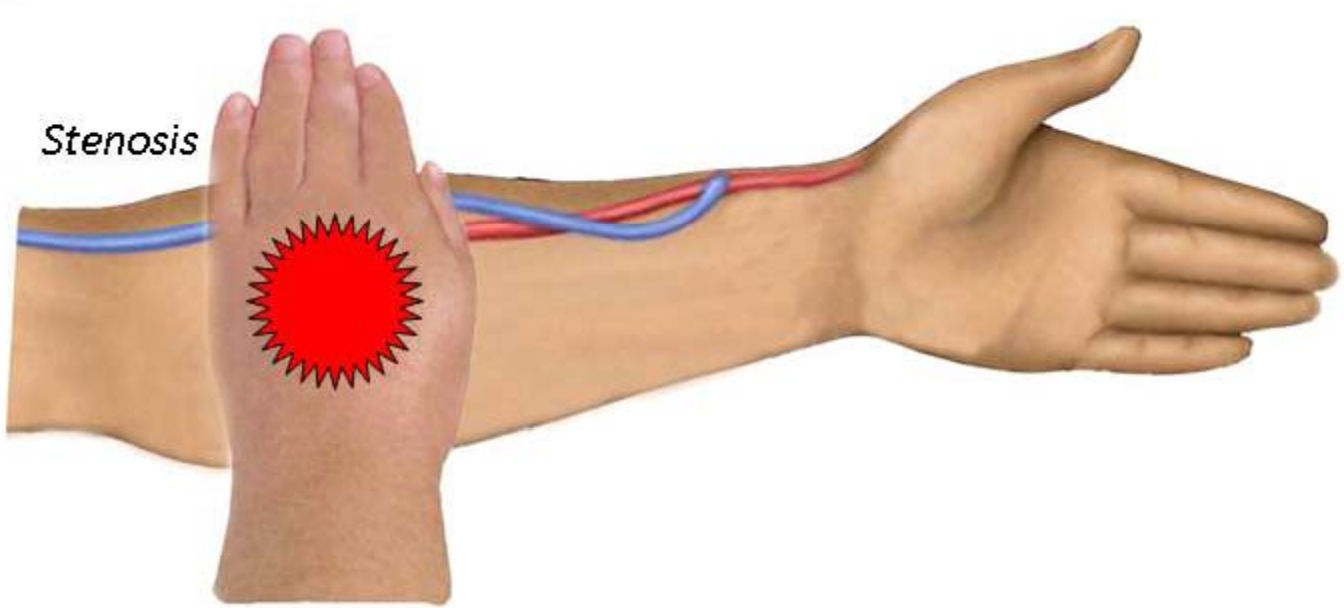
Normally:

Soft, continuous background vibration palpable over course of access

Best felt over arterial anastomosis

Its presence signifies flow

Systolic and diastolic component



Stenosis:

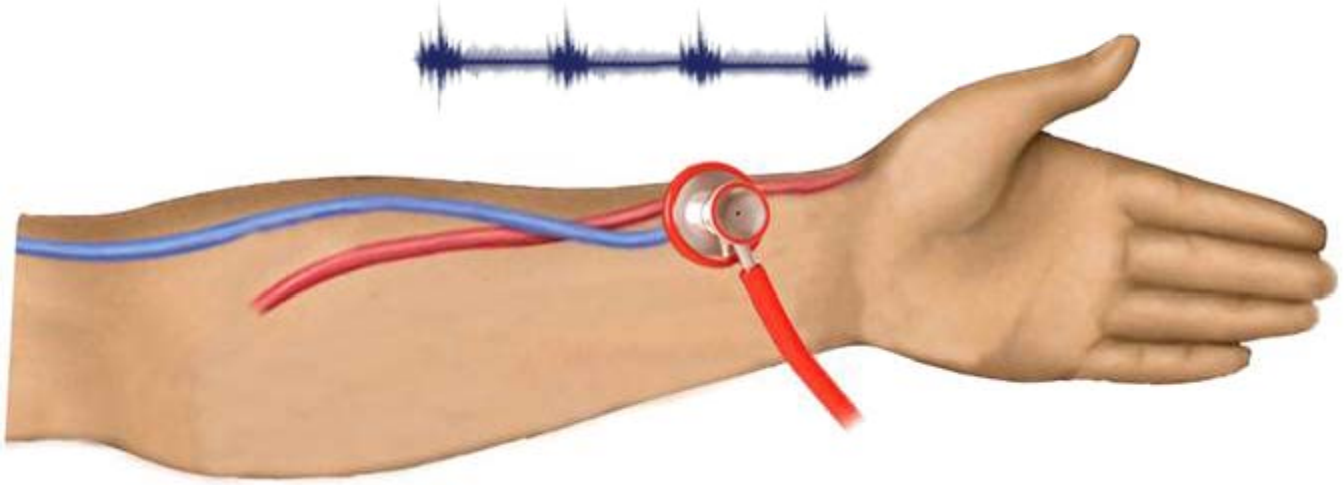
In an area of turbulent flow (stenosis) within the access or its drainage, thrill is accentuated locally at that site

With increasing resistance there is a progressive loss of the diastolic component

With severe stenosis only systolic thrill is evident

Bruit

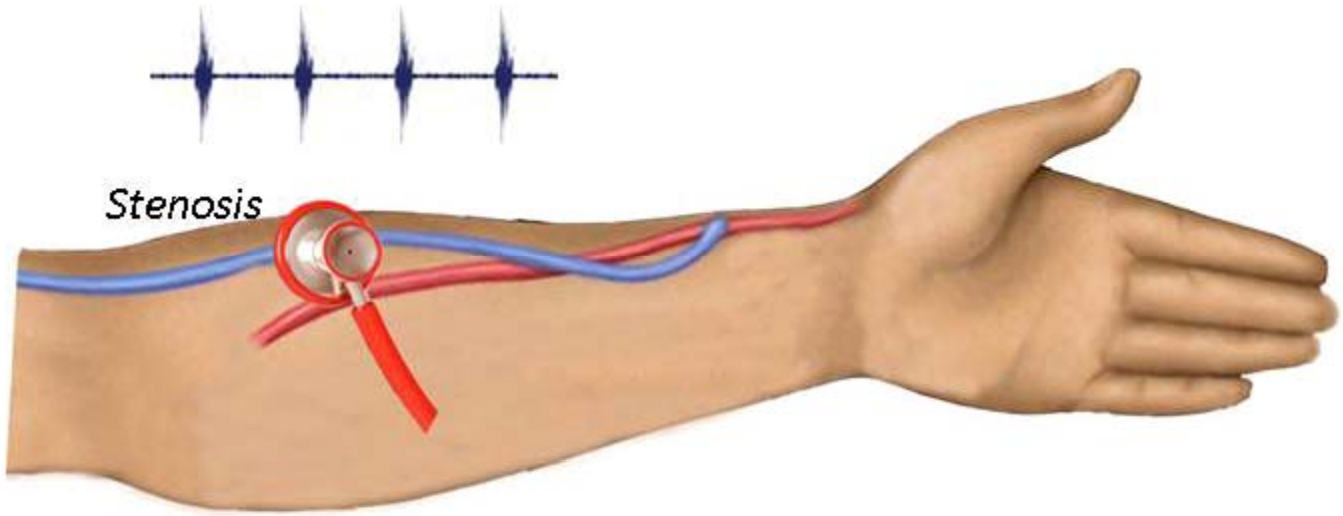
Auditory manifestation of thrill



Normally:

Has a systolic and diastolic component

Has a low pitch, a soft rumbling, machinery-like sound



Stenosis:

With increasing resistance from a downstream stenosis, the pitch becomes progressively higher as the severity of the lesion increases

Diastolic component becomes progressively shorter

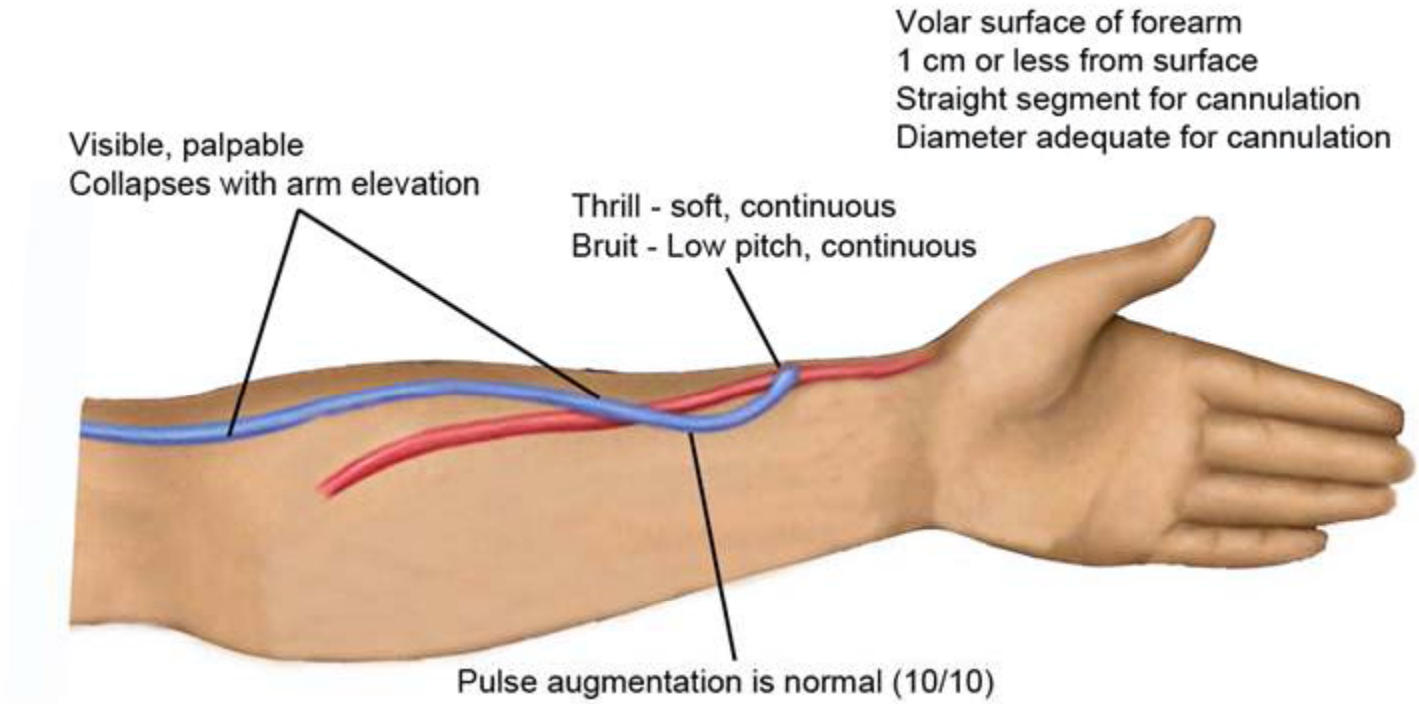
With severe downstream stenosis, the bruit may become a high pitched almost whistling sound heard only in systole

Rule of Thumb

Pulse → Bad
Indicates downstream resistance

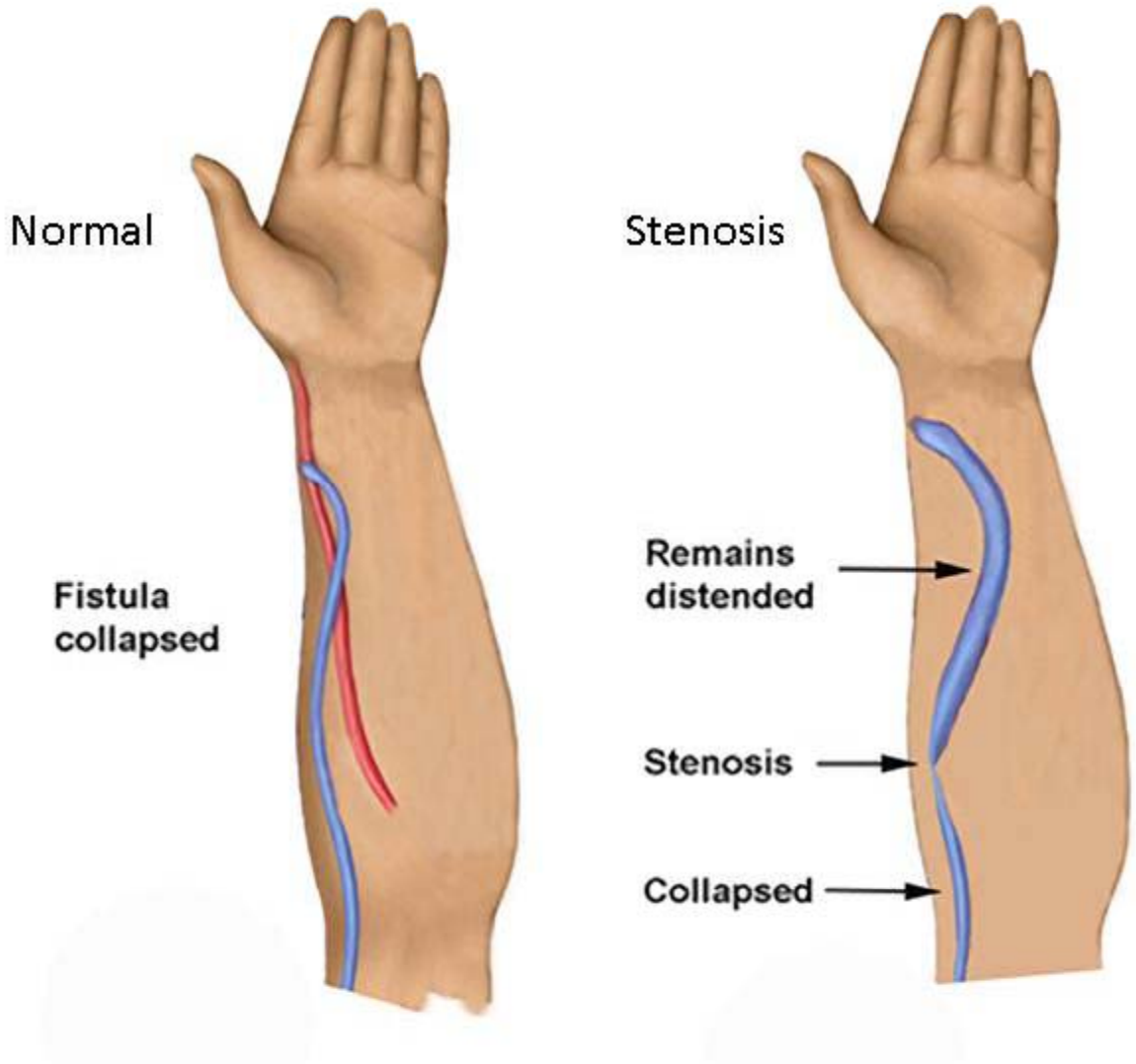
Thrill → Good
Indicates flow

Normal Fistula



Basic Maneuvers During Exam

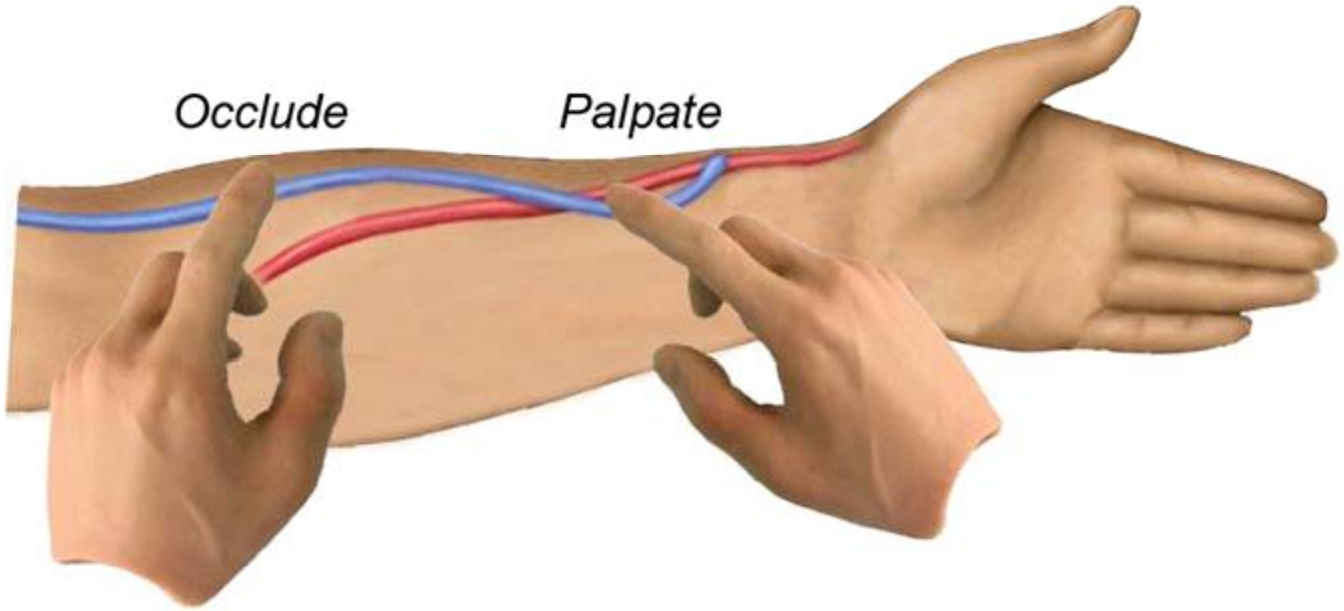
Arm Elevation



Outflow is good

No stenosis present downstream

Pulse Augmentation



If the access is completely occluded some distance from the arterial anastomosis, the pulse intensity between these two points will be augmented

By quantitating this augmentation, the quality of the inflow can be assessed

10 Second Fistula Evaluation

If AVF collapses
Outflow is good

If augmentation is good
Inflow is good

Maturation Failure

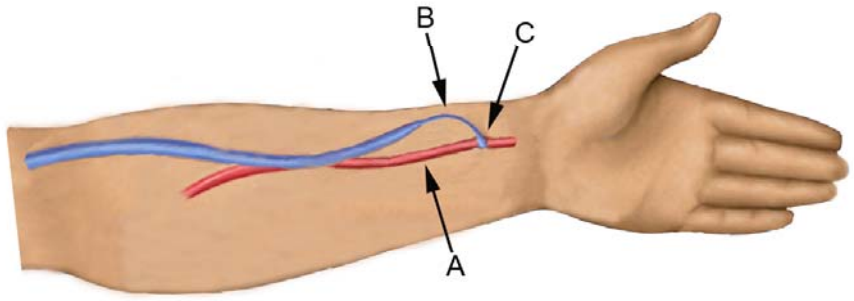
Timely Fistula Evaluation Post-Creation

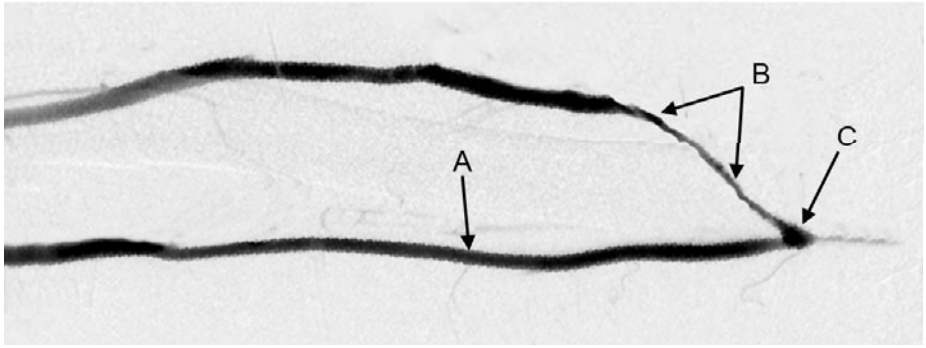
- Should be considered mandatory
  - Examine at 4-6 weeks for maturation status
- It is unreasonable to have prolonged waits – hoping that the fistula will develop
  - Not yet begun dialysis –risk that dialysis will be initiated with a catheter
  - Already begun dialysis – they are using a catheter

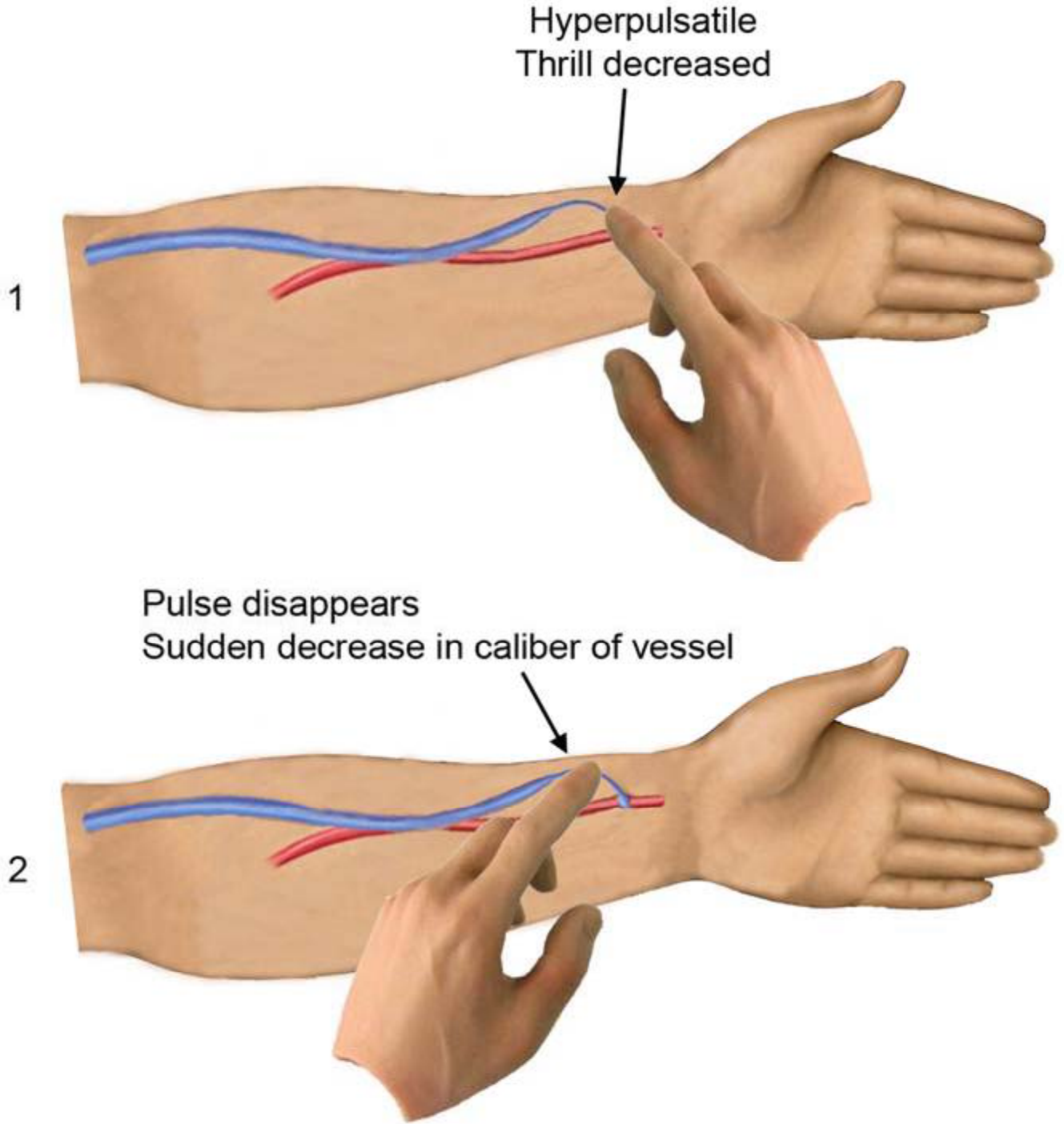
Major Reasons for Failure to Develop

Juxta-Anastomotic Stenosis

- Stenosis immediately adjacent to the arterial anastomosis
- First 2 to 3 centimeters
- Obstruct AVF inflow
- Results in failure to mature

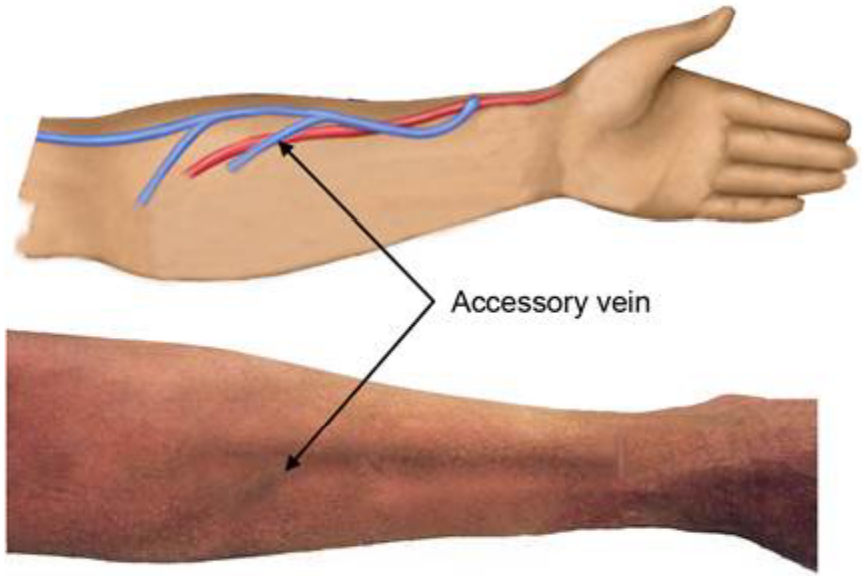


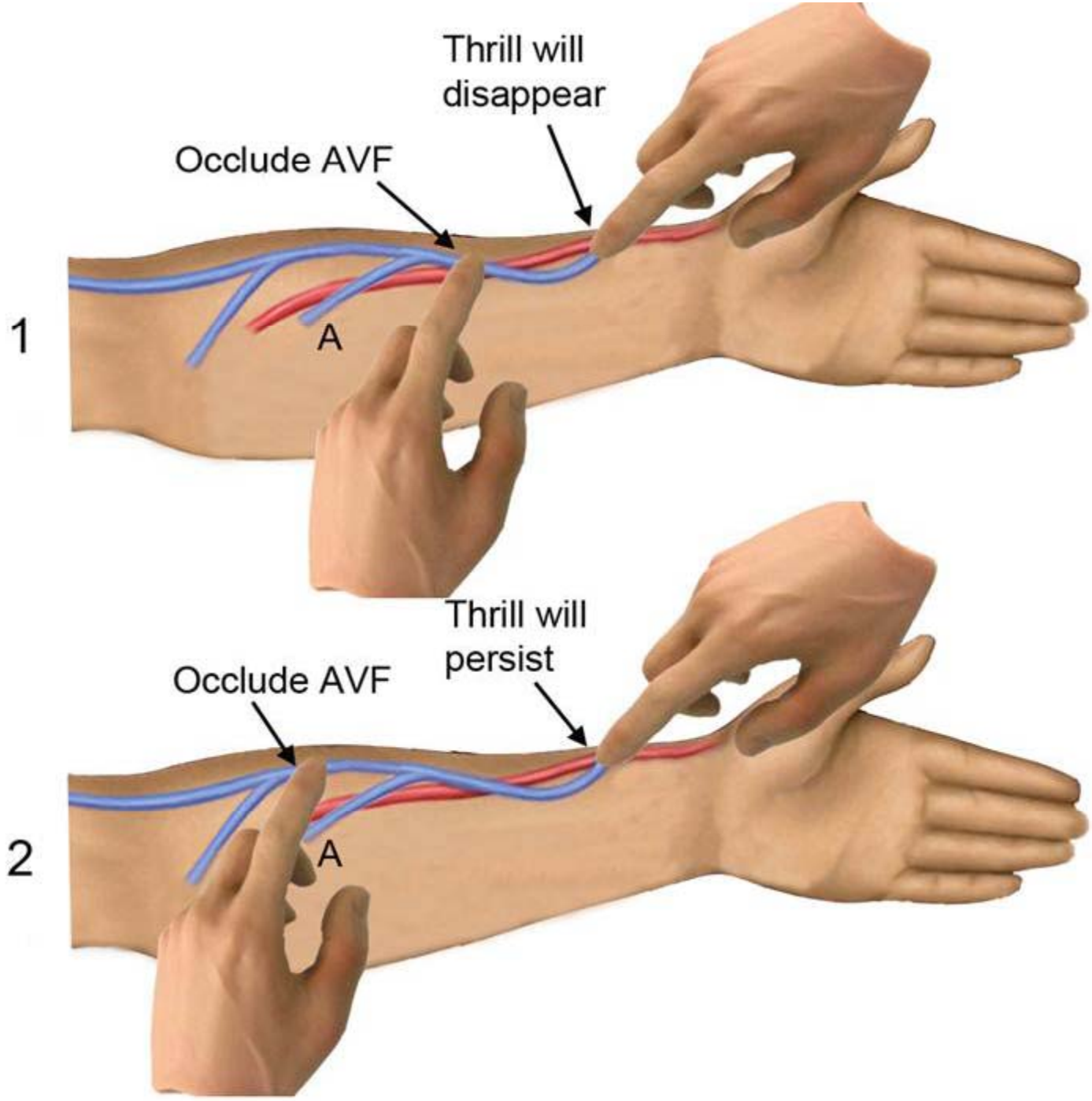



Hyperpulsatile
Thrill decreased
1
Pulse disappears
Sudden decrease in caliber of vessel
2

Accessory Veins

- Generally branches of cephalic vein
- Represent normal anatomy
- Must be distinguished from collateral vein
- May not cause a problem




Thrill will
disappear
Occlude AVF
1
A
Thrill will
persist
Occlude AVF
2
A

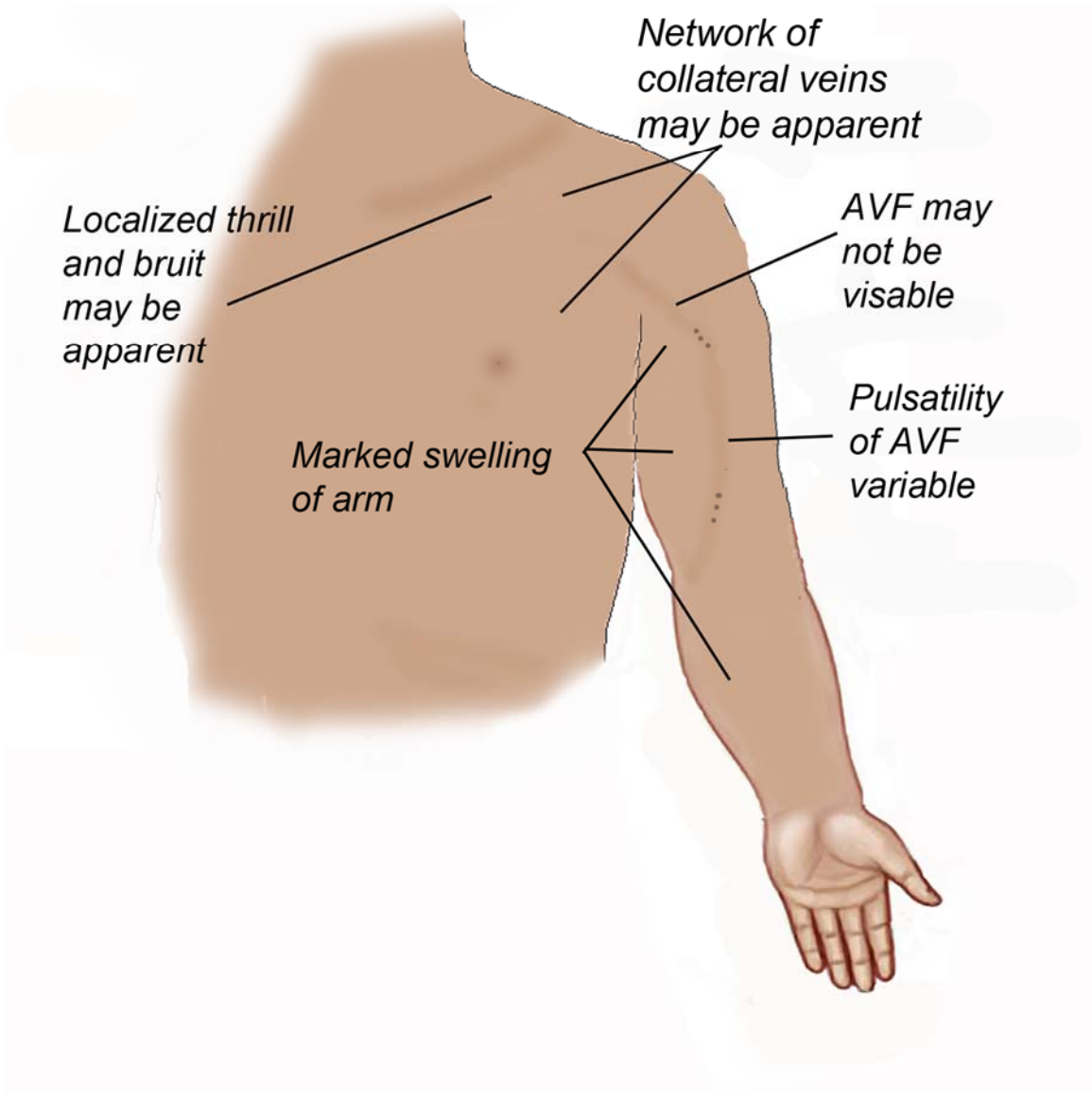
Lesions that have a predilection for different types of AVFs

Radial-cephalic AVF
Juxta-anastomotic stenosis

Brachial-cephalic AVF
Cephalic arch stenosis

Brachial-basilic AVF
Swing-point stenosis

Central Vein Stenosis


Network of collateral veins may be apparent
Localized thrill and bruit may be apparent
AVF may not be visable
Pulsatility of AVF variable
Marked swelling of arm

Steal Syndrome

Dialysis Associated Steal Syndrome

Hand cold, cyanotic
Compare with opposite hand

Evidence of tissue ischemia

Weak or absent pulse