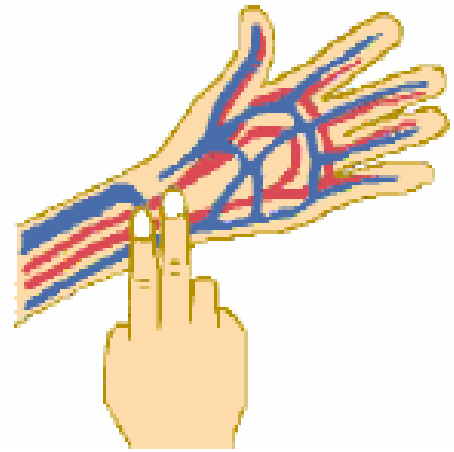
Vascular access Cannulation method- maximizing life of lifeline



Sudhir BagaRao

Most Important skills of Dialysis professional

आप चिन्ता नहि करो मे हु ना

भाऊ परत या तावडे आज आले नाहित

Canulation Steps

Step I: Identify the Type of Access and Direction of Bloodflow.

Step II: Needle Site Selection.

Step III: Skin Preparation.

Step IV: Local Anesthesia.

Step V: Needle Selection.

Step VI: Cannulation Technique.

Step VII: Securing the Needle.

Step VIII: Cannulation Problem- Solving

Step IX: Removal of the Needles

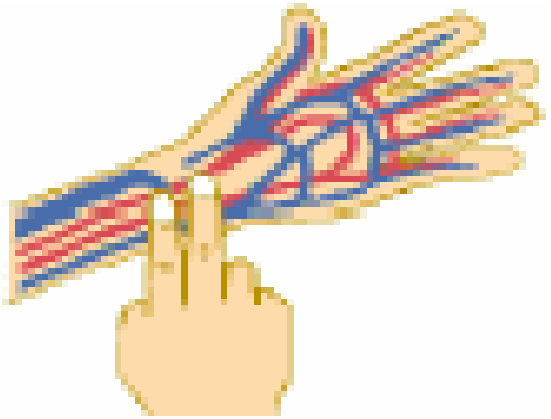
Step X: Discharge Dressing and Assessment

Assessing the Patient's Access

Observation

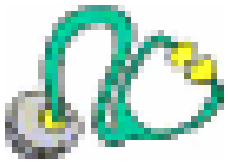
- Redness/edema/bruising
- Infection/abscess/drainage
- Infiltration
- Previous needle sites
- Choose new needle sites (include patient)

Palpation



- Track of the access
- Thrill
- Pulse

Auscultation



- Bruit
- Direction of flow

Skin Preparation Technique for Permanent AV Accesses

A clean technique for needle cannulation should be used for all cannulation procedures.

Preparation for Needle Insertion

Patient should wash their access with anti-bacterial soap and water before coming to their bed.

Apply Betadine in a circular motion from each selected needle site outward and let it dry completely.

If iodine allergy, use 70% alcohol. Clean sites in a circular motion for 60 seconds immediately prior to each needle insertion.

Local Anesthetics

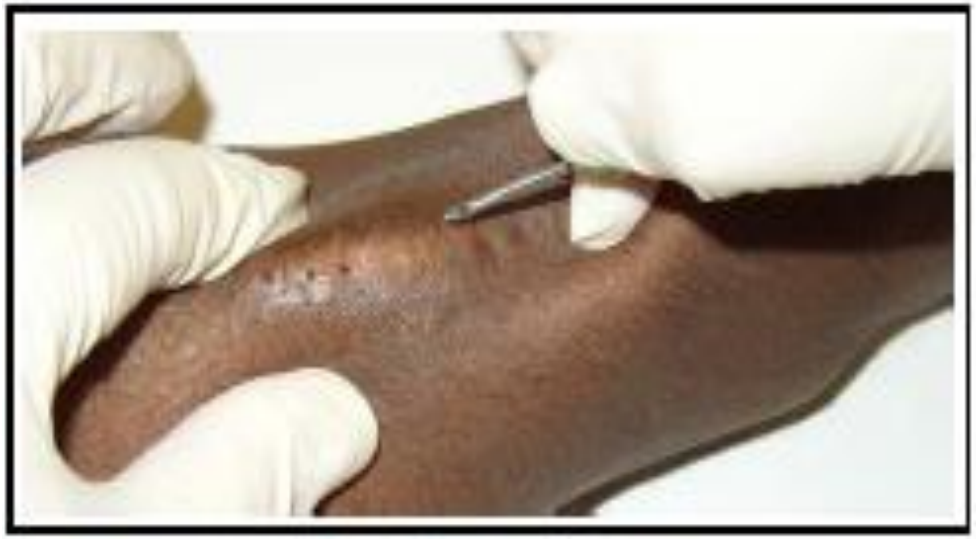
Intradermal lidocaine to arterial then venous sites. Use of lidocaine should be discouraged as it causes scarring. It should be used only by request of the patient.

Ethyl chloride spray to arterial site just prior to inserting needle, then to venous site just prior to inserting needle.

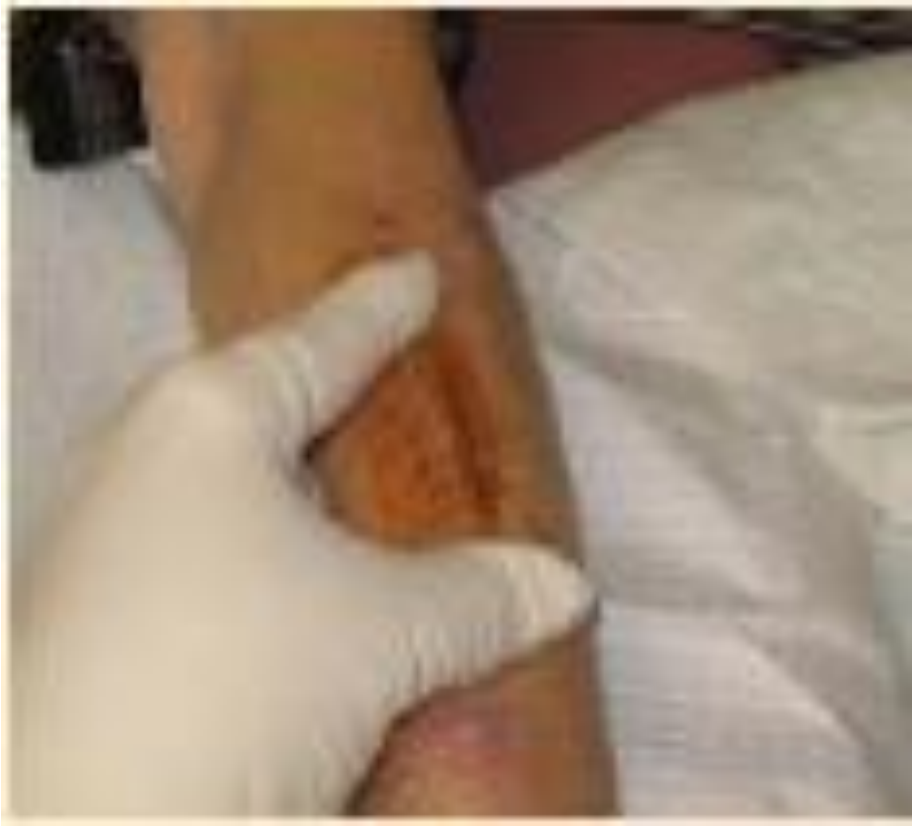
Blood Flow Rate Vs Needle Gauge

BLOOD FLOW RATE	NEEDLE GAUGE
< 300 ml/min	17-gauge
300-350 ml/min	16-gauge
350-450 ml/min	15-gauge
> 450 ml/min	14-gauge

Anchoring Needle Three point technique



Anchoring Needle - L Technique

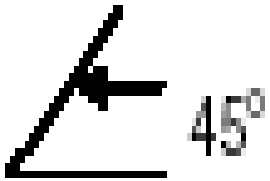


Once you see the flashback: stop advancing; drop the angle to skin surface; and, advance down the center of the vessel.

Angles of Entry

- Rule of thumb:
  20-35° angles for fistulas

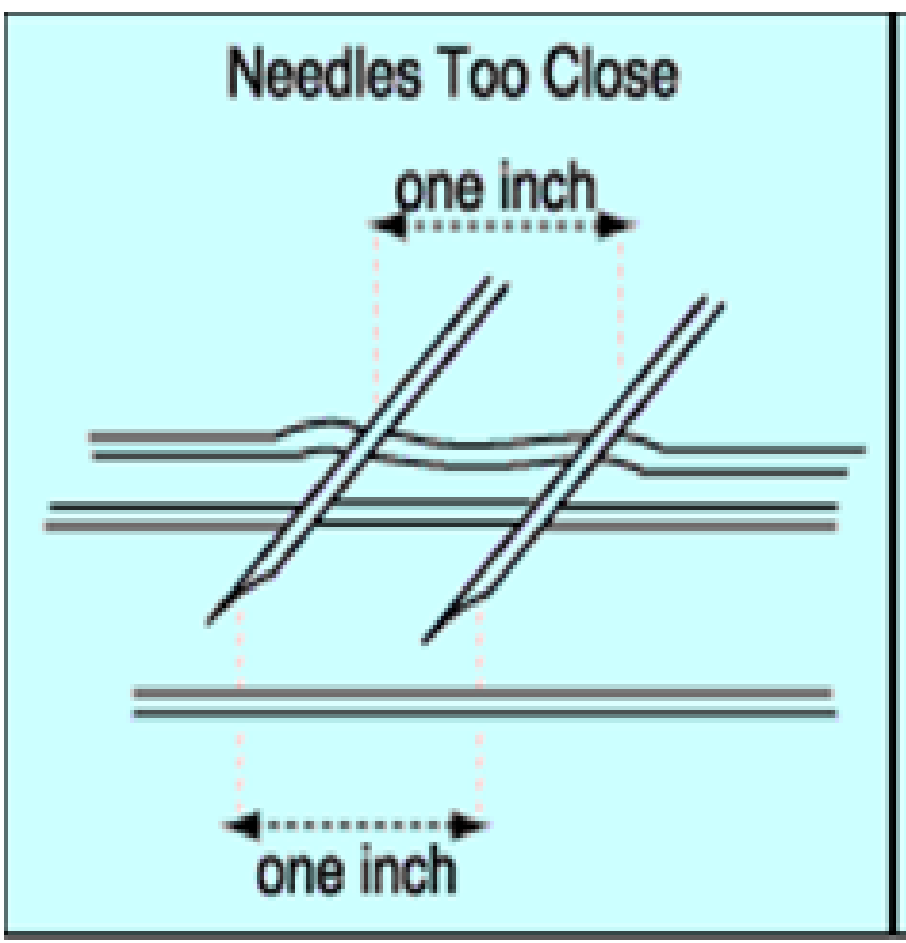
45° angle for grafts

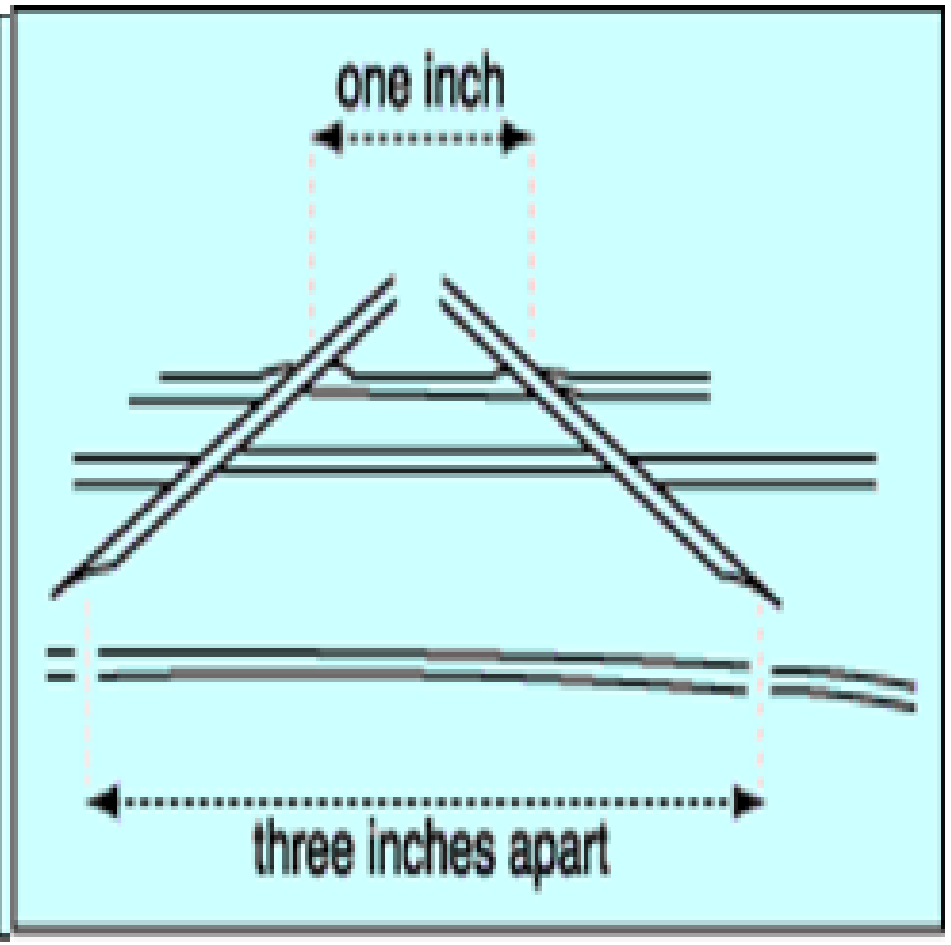


Reality:

Not every access will fit the “rule of thumb.” You will need to carefully assess the depth of the access and adjust your cannulation angle accordingly.

Distance between two needles?





Canulation Approach

- Rope Ladder Technique.
- Button Hole Technique.

Rope Ladder Technique

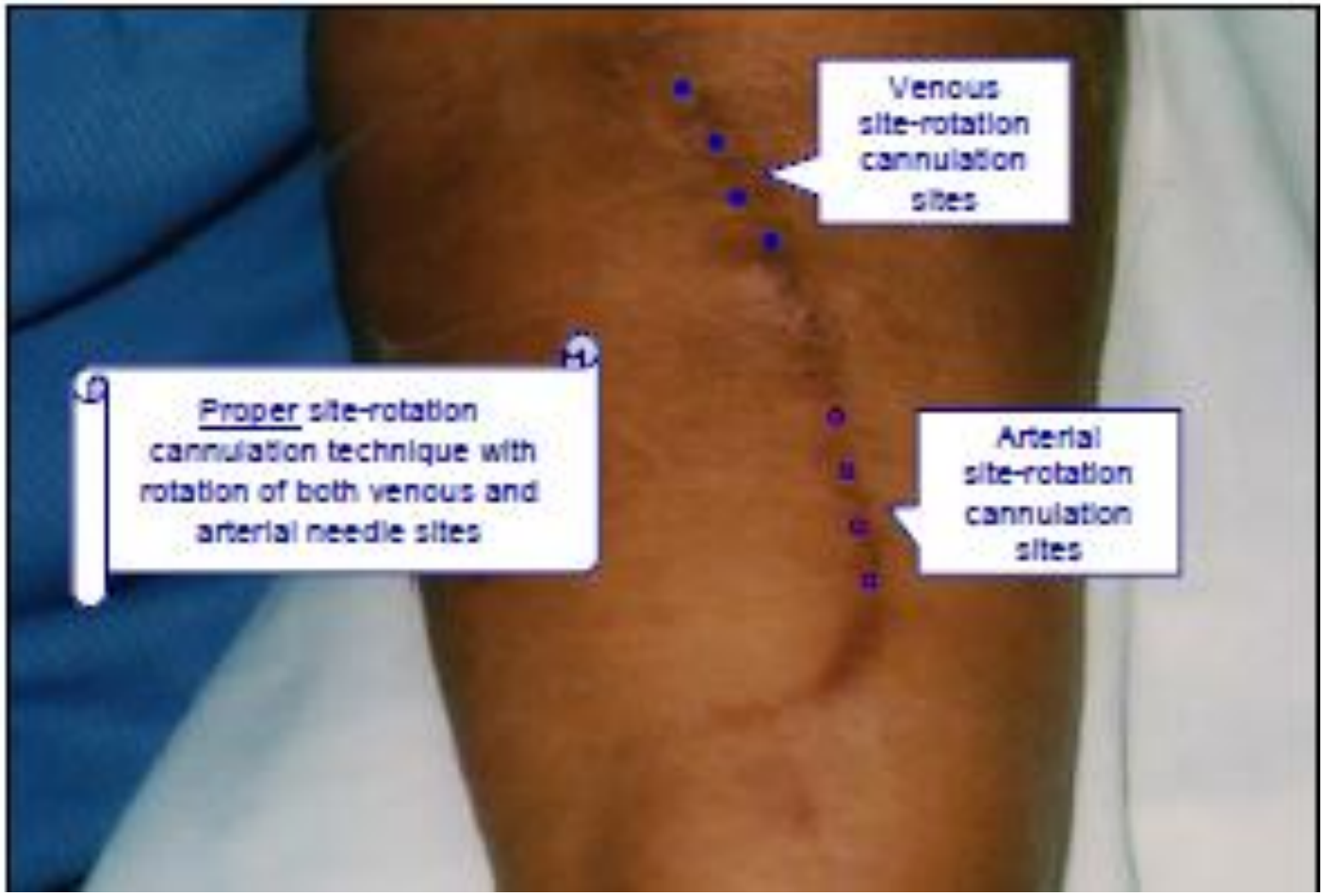
- Utilizes the entire length of the access for cannulation.
- Prevents “one-site-itis”
- Needle tips need to be at least 1½” apart. Needles need to be at least 1½“ away from an anastamosis.
- Avoid aneurysms, curves, and flat spots.

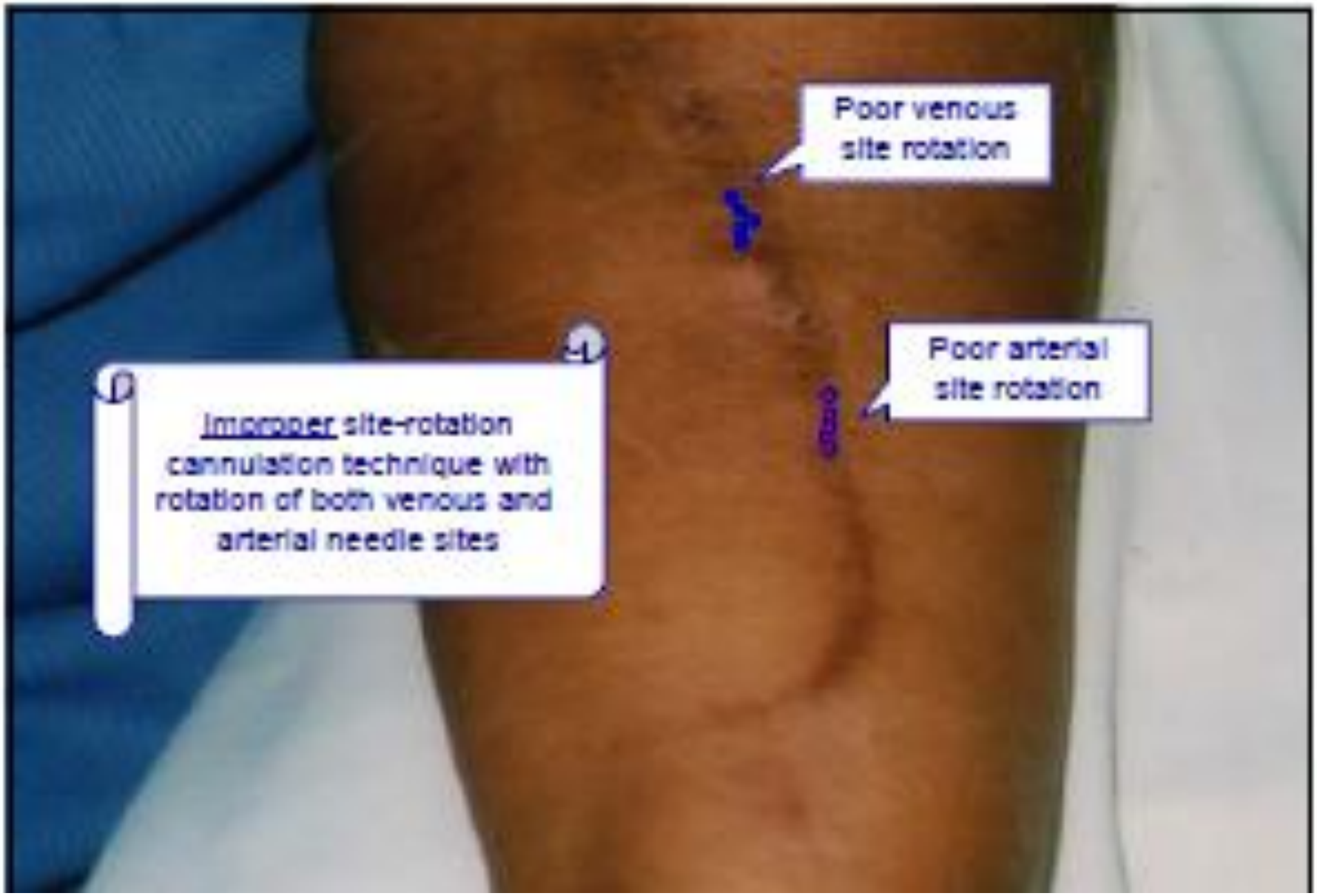
Rope ladder technique

- Cannulation sites are rotated up and down

the AVF to use its entire length Classic technique used in most dialysis centres

Rope ladder Technique



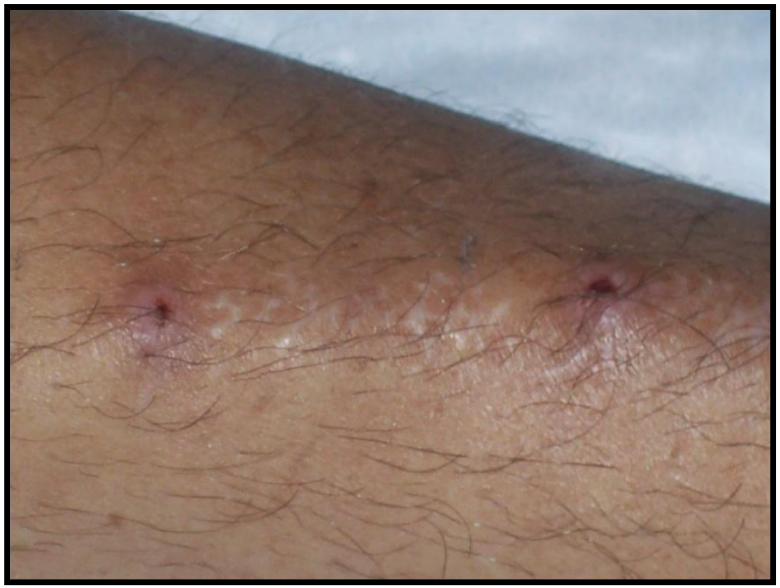

Poor venous site rotation
Poor arterial site rotation
Improper site-rotation cannulation technique with rotation of both venous and arterial needle sites

Prevent this

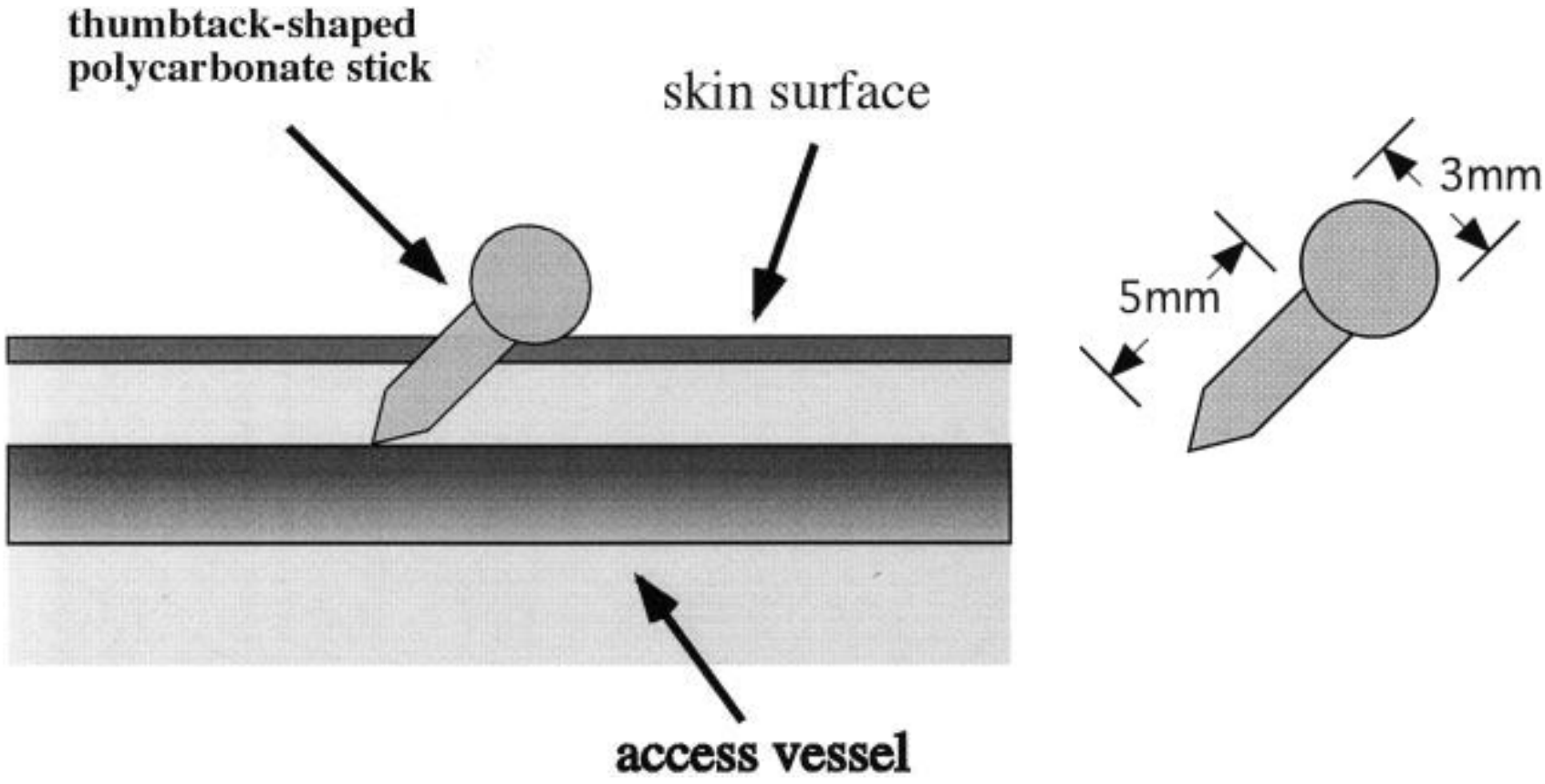
The buttonhole technique, first used with individuals who had limited AVF cannulation sites, was described by Dr. Twardowski.

BUTTONHOLE TECHNIQUE

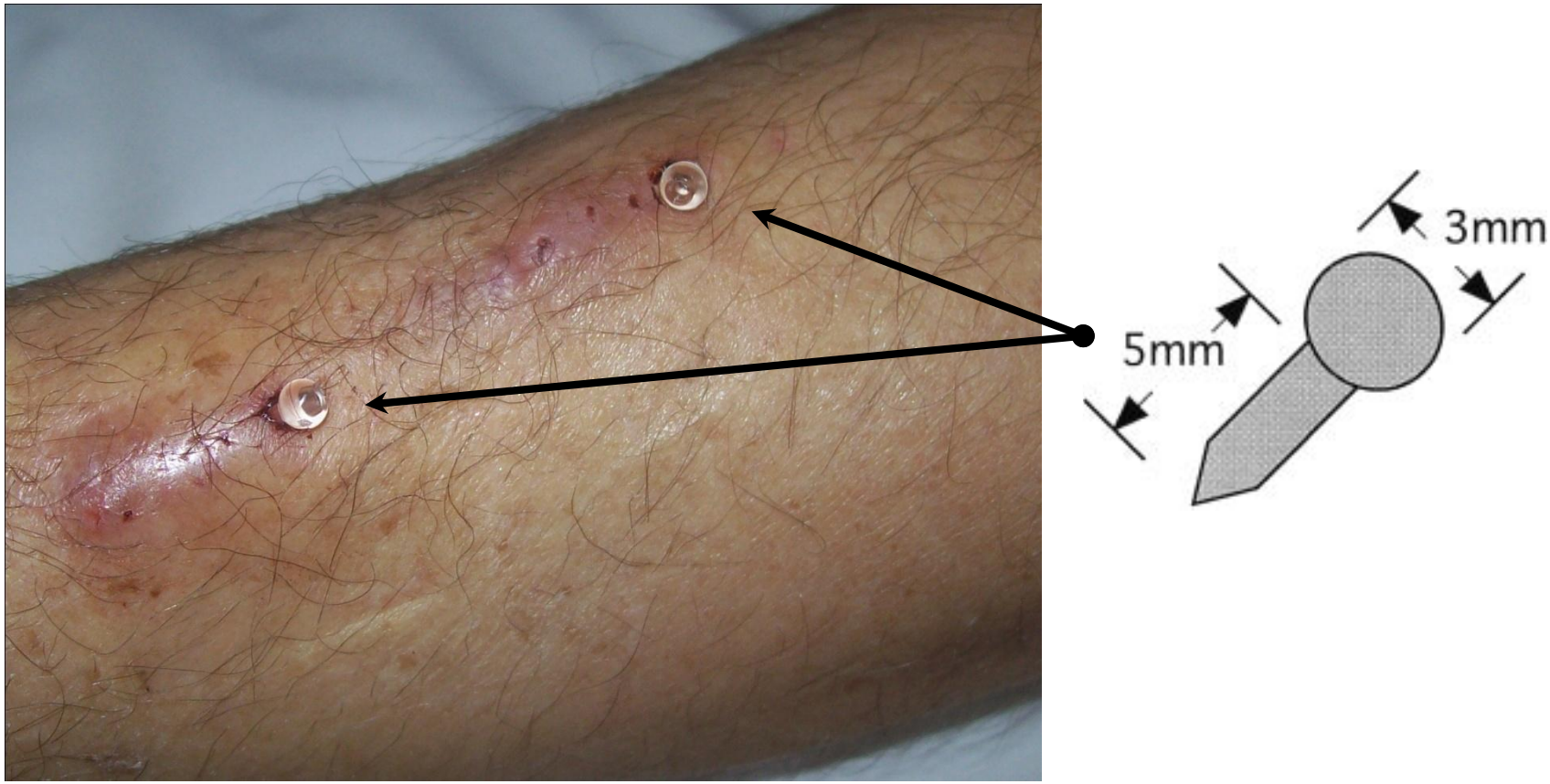
- Cannulating the fistula in the exact same spot, at the exact same angle and depth every time the needles are inserted.



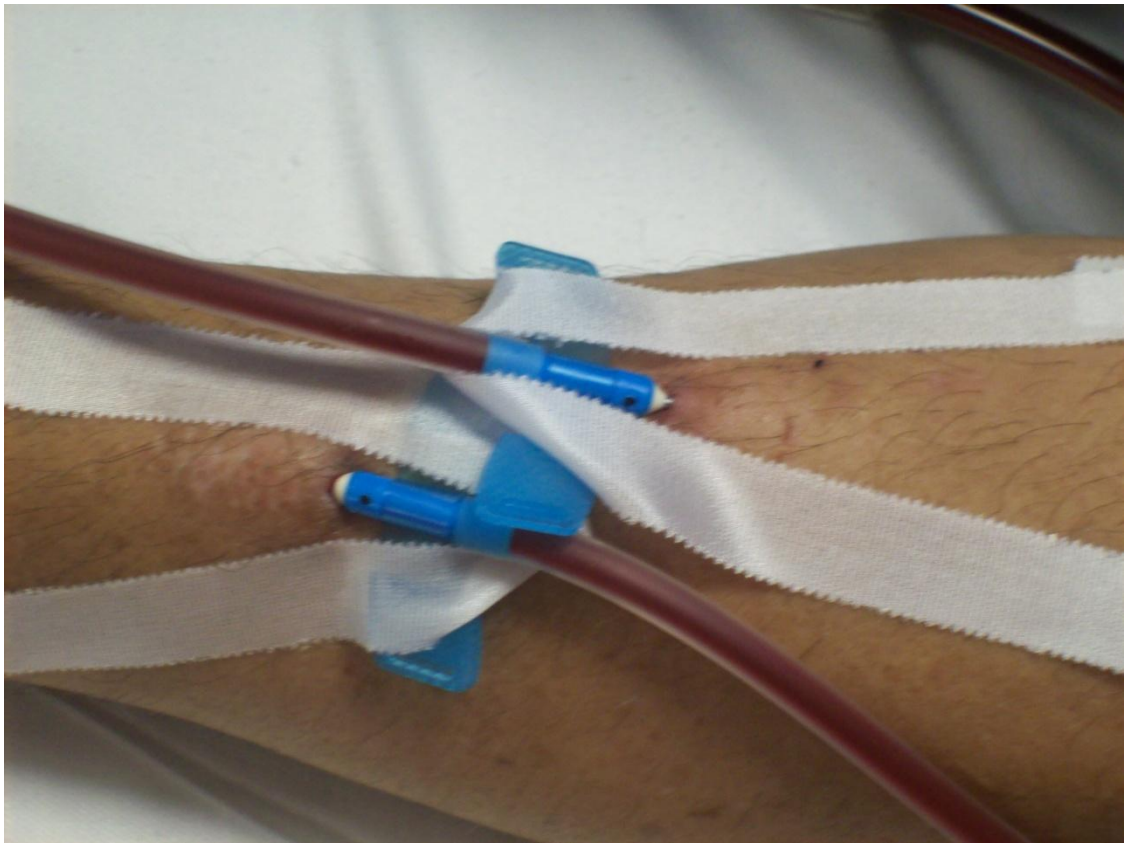
BioHole Device

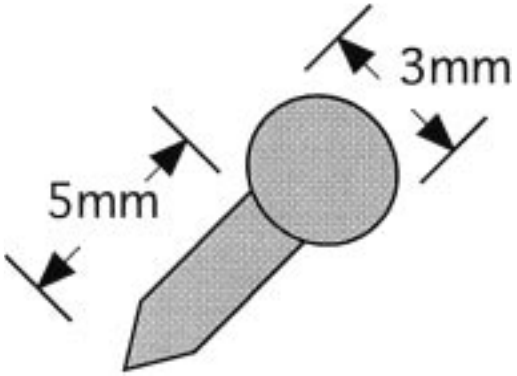


BioHole Device



BioHole Device





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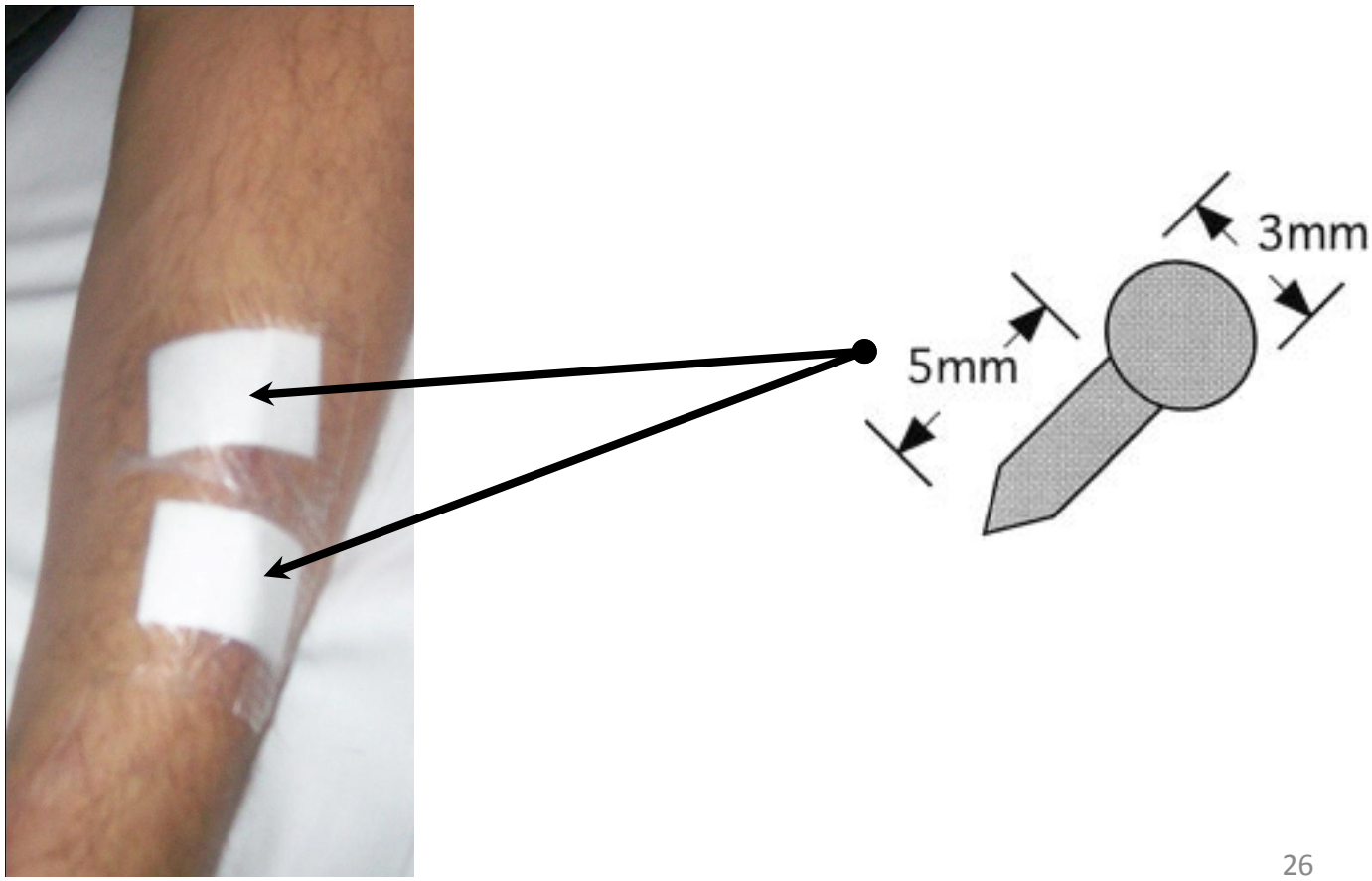


Procedure for Button Hole

- Assess the access.
- Remove the scabs from previous needle insertions with disinfected tweezers.
- Clean sites per unit protocol.
- Using the 3-point technique, stabilize the access and pull the skin taut.
- Insert the needles at the appropriate angle and depth for the access - keeping the same angle and depth for every cannulation.
- When flashback is observed, lower angle of insertion.
- Advance needle down the center of the vessel.
- Place tape over the wings and the insertion site.
- Confirm good flow using a syringe.

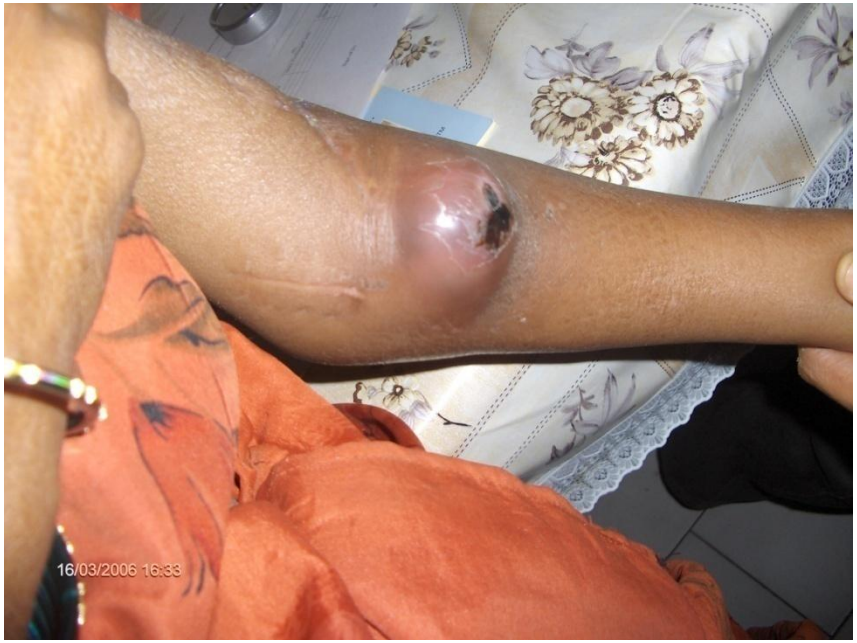
Flipping Needles

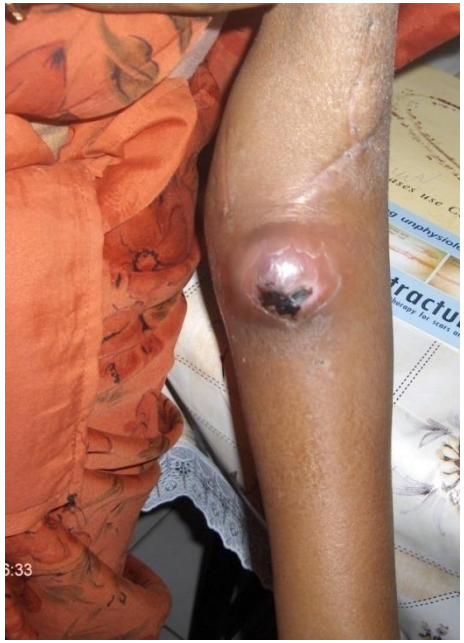
Flipping needles can accidently core an access requiring surgical repair.

Flipping needles can cause the insertion site to enlarge allowing bleeding from the sites.

Flipping needles should be discouraged in your facility.

Infection





Cannulation of a New AV Fistula

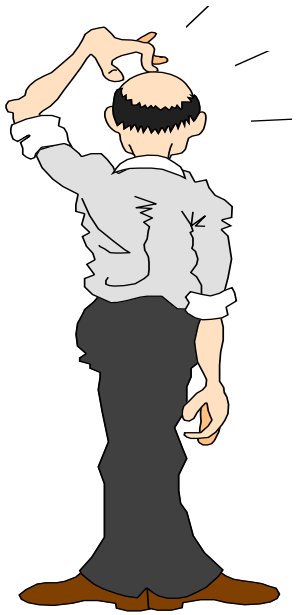
- **Policy:** Newly created primary AVF shall be allowed to develop for at least 8-12 weeks prior to cannulation.
- Initial attempts to perform dialysis via new fistulae shall proceed with caution.
- Without exception, fistulae shall not be progressed faster than these guidelines **without Nephrologist's order**.
- All patient care personnel are responsible for implementing this policy.

Management of a new AV Fistula

Study OP notes & make diagram

Needle different Areas

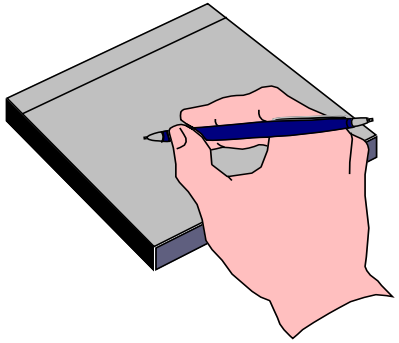
Review QA's & Recirculation



Results O.K.?

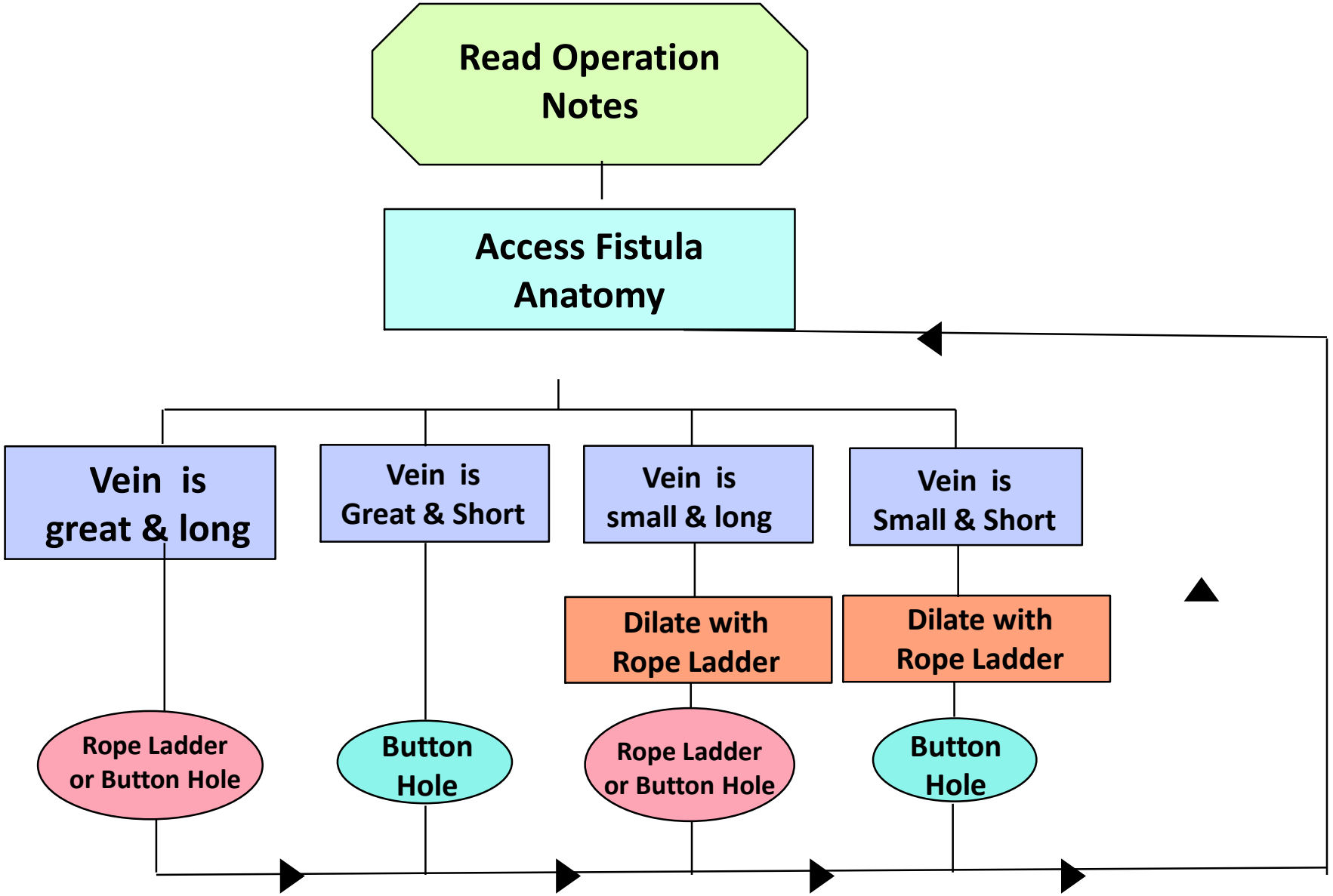
No

Yes



Needling Protocol

Fistula cannulation protocol



TIPS AND TROUBLESHOOTING

Time – Take your time to perform a good assessment of the access and chose your sites wisely. If in doubt, ask for help.

Technique – Use the three-point technique every time you cannulate. Needles go in smoother and are less painful.

Resistance – Stop when you encounter resistance. Pull back slightly and readjust your direction and/or angle.

Infiltration – If infiltration occurs before dialysis is initiated, remove the needle. If it occurs after heparinization, leave the needle in place (unless it is causing extreme pain for the (patient) and place another needle above the infiltrate. After the “on” is complete, place ice on the site. Teach the patient to elevate and ice the access at home if the infiltrate is large

TIPS AND TROUBLESHOOTING

Vessel Spasm – Sometimes fistula diameters are small and when the blood pump is turned up the vessel will spasm, causing machine alarms. Placing the arterial needle toward the arterial anastomosis (retrograde) may help.

Deep Access – If you are having a hard time feeling the access, use your stethoscope to listen for the bruit along the entire length of the access. Do not just stick blindly or use prior needle tracks. Assess the access.

Taping – Taping an AV fistula needle site tightly can cause the needle to rest against the vessel wall resulting in poor arterial flow and frequent arterial pressure alarms. This is a particular problem with a very superficial mature fistula. This can be avoided by taping securely, not tightly.

Needle removal

- Apply gauze dressing without pressure
- Remove needle at insertion angle
- Apply pressure with 2 fingers
- Do not use excessive pressure
- Hold for 10–12 minutes.
- Use stethoscope to check for bruit after applying dressing to stick site