BCRenal
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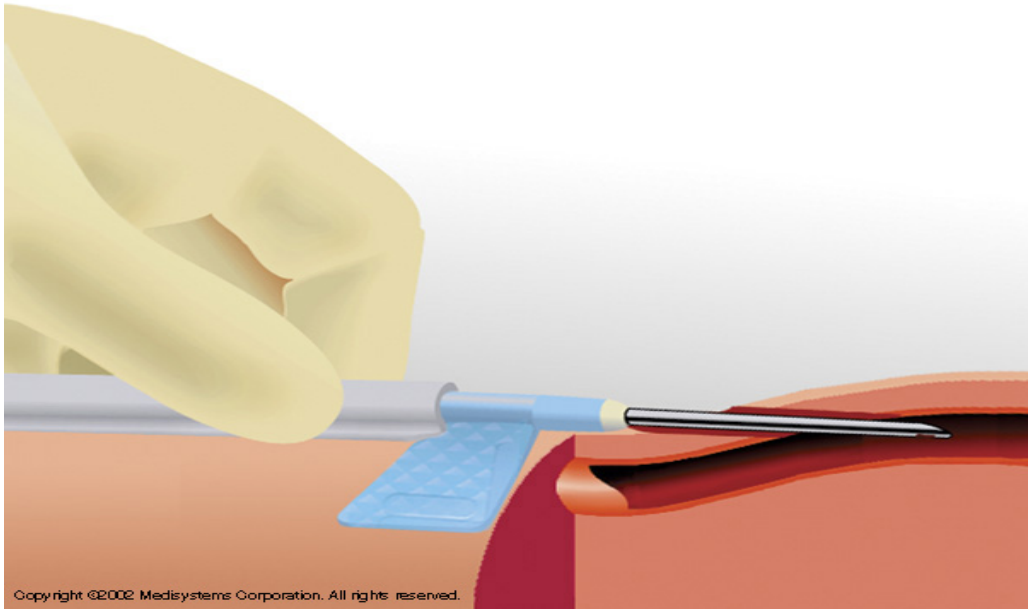
BUTTONHOLE CANNULATION

What is a Buttonhole?



Technique in which an AV fistula is cannulated in the exact same spot, at the same angle and at the same depth of penetration every time.

Benefits

- Reduction of cannulation discomfort.
- Increased ease of cannulation.
- Reduction of hematomas.
- Reduction of access interventions.
- Reduction of aneurysm formation.

Drawbacks

- Increased risk of infection (especially if cleaning is not done properly & scab is not removed completely).
- Cannulation of a BH track is best done by one cannulator only. Self/caregiver cannulation is recommended for BH tracks. Nurse cannulation is NOT recommended.
- BH tracks can only be used with fistulae (not grafts). If combination fistula/graft, BH method may be used if stay clear of graft area.

Characteristics of a Successful Self/Caregiver Cannulator

- Desire to self-cannulate and/or has caregiver willing to cannulate.
- Good hand dexterity (able to hold the needle and not shaky).
- Good sensation in fingers.
- Good eyesight.
- Good personal hygiene.
- Mental capacity to be successful at self/caregiver cannulation.

Rope Ladder vs. Buttonhole Technique for Self/Caregiver Cannulation

Rope Ladder

- Capacity to understand the concept of rope ladder and assess and track rotation of sites.
- Willingness to undertake rope ladder technique.
- Risks of rope ladder technique reviewed with the patient.
- Fistula easy to cannulate.
- Easily palpable vein.
- Large area of straight vein available for cannulation.

Buttonhole

- Willingness to undertake BH technique.
- Risks of BH technique reviewed with the patient (slightly higher risk of infection, although the risk is still small).
- Fistula has short, limited space for cannulation.
- Deemed to be appropriate for the BH method of cannulation by nephrologist, VA nurse and/or home hemodialysis educator.

Buttonhole Technique: Reducing the Risk of Infection

- Keep tunnel as close to the diameter of the needle as possible.
- Use tourniquet to “plump up” the vessel.
- Stretch skin taut from side-to-side to keep the vein stable and minimize needle movement.
- Clean skin rigorously prior to inserting needle.
- Ensure scab is removed completely. Do not use tweezers. Use a separate, sterile red blunt fill needle.
- Use only blunt needles in an established BH track.
- Keep 2 mm of needle exposed (to prevent “hubbing”).
- Use an antimicrobial cream prophylactically after withdrawal of needles.

Establishing Buttonhole Tracks: Considerations

- BH tracks may be established on new or mature, well-functioning fistulas; however, mature fistulas are preferred.
- Choose sites easy for the patient/caregiver to cannulate.
- Choose straight, relatively unused sections of the access. Try and allow >2 inches between the tips of the needles. Start near the AV incision to leave room for future BH sites.
- If available, use bedside ultrasound to map BH sites.
- Measure and document BH site locations and needles used.
- Photograph BH sites and angle of cannulation for Kardex.

Who May **Establish** a BH Track?

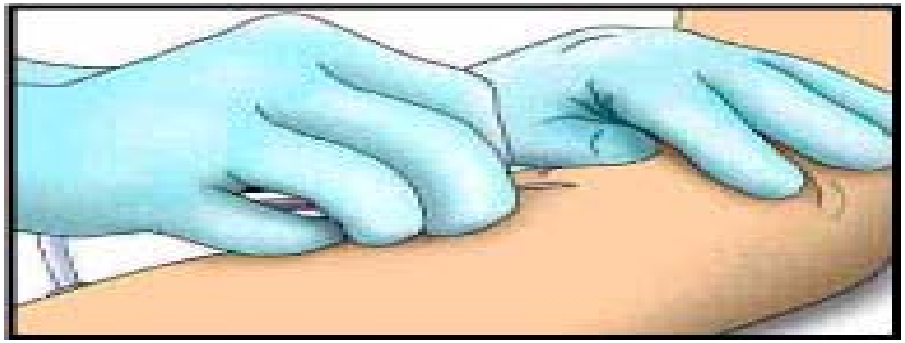
- BH tracks may be established by:
  - Patients/caregivers; or
  - Home HD and/or advanced cannulator (designated by VA RN).
- If a nurse initially establishes the track, transfer the function to the patient/caregiver ASAP.
- Same cannulator should cannulate the access until the track is established (usually takes 8 – 18 cannulations).
- If the patient/caregiver is unable to self-cannulate and/or nurse cannulator is not available and/or not successful:
  - Cannulate the track using conventional sharp needles placed antegrade and >1 inch (2.5 cm) from the BH site.
  - DO NOT use sharp needle in the BH track.

Who May Cannulate an **Established** Track?

- Patient or caregiver (recommended).
- Nurse cannulation not recommended.

Establishing a BH Track

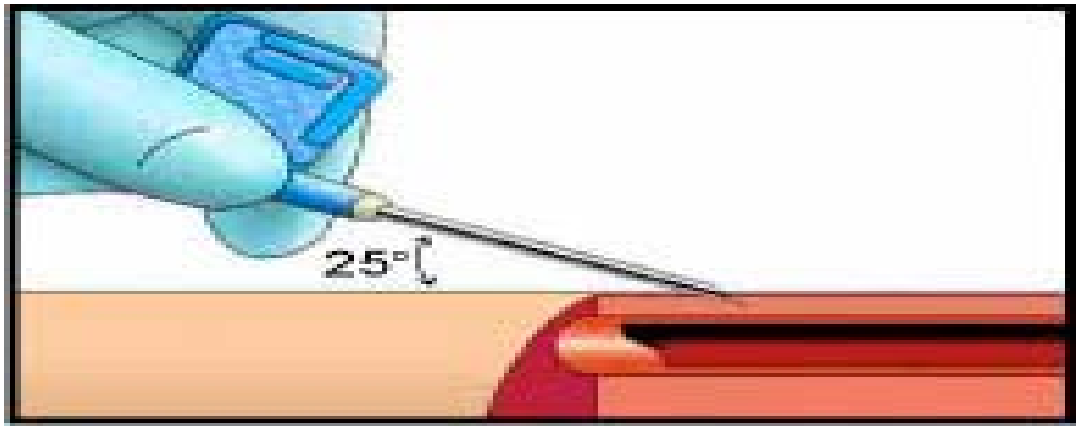
1. Instruct patient to wash access.
2. If first cannulation, select appropriate cannulation sites (using bedside ultrasound if available).
3. Cleanse sites with appropriate cleansing solution. Cleanse before and after removing the scab.
4. Apply tourniquet 4 in higher than the venous (top) needle.
5. Using a sharp needle, remove cap & hold needle by the plastic wings with the bevel up.
6. Pull back on the skin with light pressure below where the arterial needle will be placed.



Photograph provided courtesy of Medisystems, a NxStage Company.

Establishing a BH Track cont'd

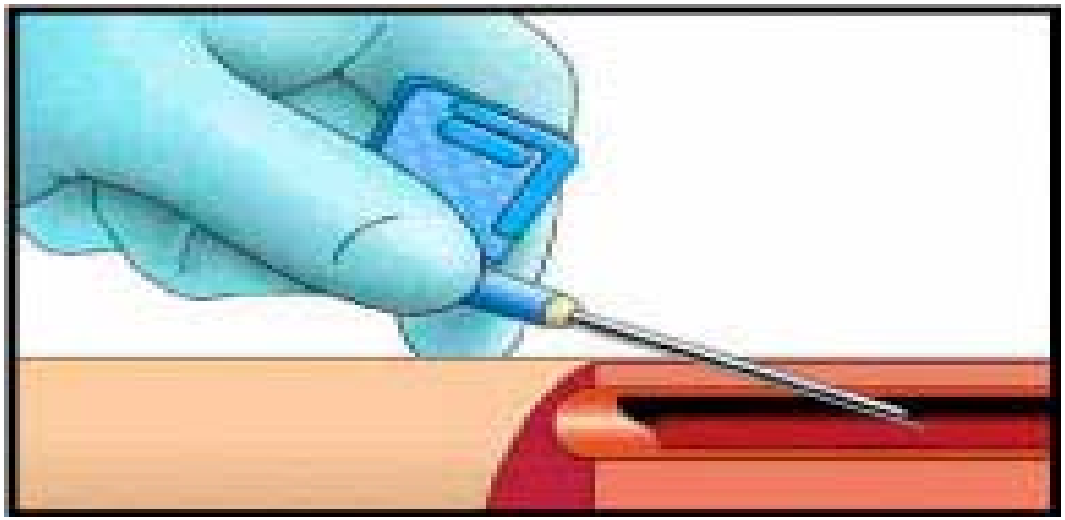
7. Insert needle using a 25º angle, although this may vary depending on the depth of the fistula.



Photograph provided courtesy of Medisystems, a NxStage Company.

Establishing a BH Track cont'd

8. Flatten angle once you see blood pulsing (flashback). Slowly advance needle almost to the end in the same direction as the fistula. To prevent "hubbing", leave the last 2 mm of metal part of the needle exposed.



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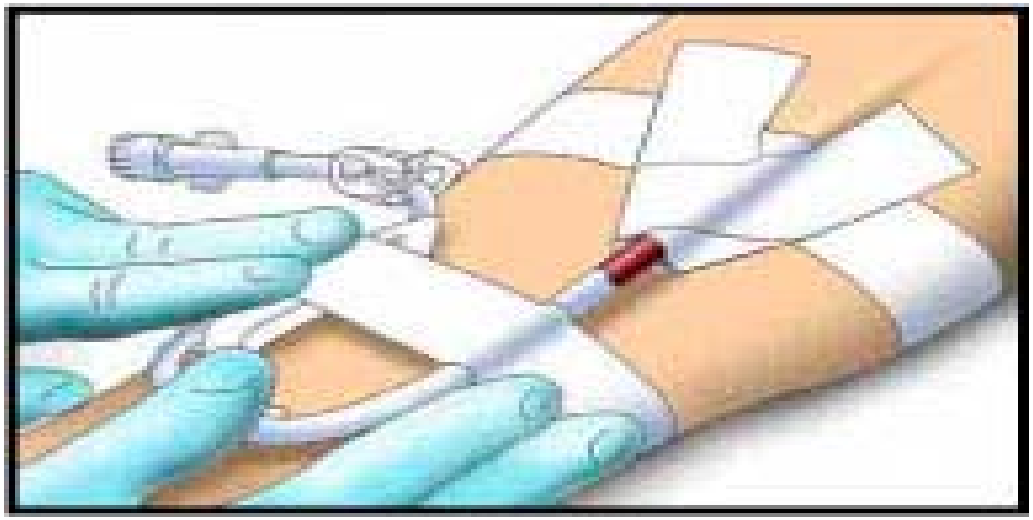
Establishing a BH Track cont'd

9. Securely tape the AV fistula needle.
10. Insert the venous needle & proceed with dialysis treatment.



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Removal of Needles

- Remove needles in the direction they were inserted. Apply direct pressure for 10 – 15 minutes.
- Once bleeding stops, either:
  - Cover the exit site with a Curity AMD Band-Aid impregnated with 0.2% polyhexamethylene biguanide (PHMB) (one Band-Aid per site). Instruct patient to remove Band-Aids after 4 – 6 hours; OR
  - Apply 2% Mupirocin cream (size of a pea) to each site. Cover sites with sterile 2x2 gauze. Instruct patient to remove gauze in 4 – 6 hours and, using sterile gauze, wipe away excess Mupirocin cream.

When to Change to Blunt Needles

- BH site looks well-healed
- BH site has a round hole
- Resistance in the track is decreasing with each use.
- If 2 unsuccessful BH cannulation attempts on same HD run, cannulate new rope ladder site >1 in away from the BH track using sharp needles.
- Consult nephrologist if difficulty cannulating BH track at >1 consecutive HD session.

Tips/Troubleshooting BH Tracks

Problem	Description	Tip
Fluid overload	Causes tissues to swell and may narrow the BH track	• Gently rotate the needle slightly, side to side • Flush needle tubing with saline, allowing it to drip off the end of the needle.
Needle won't go in	Drinking extra fluids may cause fluids to stay in the track and cause the track to stretch and/or the flap to move out of position	Insert needle into the vessel, then gently lift up or lower the needle and try to insert.
Unstable BH site	Excess upper arm tissue or skin	Place cushion under access arm as far up in the axilla area as possible (better visualization and raises and stabilizes arm for cannulation)

Tips/Troubleshooting BH Tracks

Problem	Description	Tip
Difficulty getting blunt needles into the fistula ("trampoline" effect)	Fistula is thick walled; and/or blunt needles not pointed enough	• Use touch cannulation technique. • Allow needle to direct the needle down the BH, and not the cannulator. • Hold tubing with the thumb and forefinger just behind the wings.
Oozing and large scabs		Use single cannulator (prevents cone-shaped tunnels and large scabs).
Excessive bleeding		• Check for stenosis, track being cut or damage to vessel wall flap. • Do not use sharp needles. • Do not flip needles. • Evaluate anticoagulation.

Tips/Troubleshooting BH Tracks

Problem	Description	Tip
Infection	Dialysis patients are highly susceptible to infection	**Skin cleaning:** •Patient to wash arm immediately prior to cannulation •Cleanse needle sites prior to and after scab removal (circular, outward motion) Apply Curity AMD Band-Aid impregnated with 0.2% PHMB OR 2% Mupirocin cream (size of pea) to each BH site post dialysis. **Proper scab removal:** •Soak scabs with a disinfectant-soaked gauze or tape an alcohol wipe over sites prior to removing. •Gently lift the scabs off with a disinfectant swab or red blunt fill needle (one per site).