


# Cannulation Site Selection and Preparation



## Physical Assessment

- Assess AVF before every cannulation
- Compare arms for changes in skin color, circulation, integrity
- Inspect
  - Access extremity for central or outflow vein stenosis
  - Distal areas of extremity for steal syndrome
  - Access for vessel size, cannulation areas, infection, aneurysms
- Palpate
  - Temperature change may mean infection or stenosis
  - Change in thrill may mean stenosis
- Auscultate
  - Listen to entire access for changes in bruit that indicate stenosis

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## Identify Ideal Segment of AVF

- Look and feel for a straight segment of AVF
- Segment must be as long as the needle length (ie, 1" minimum)
- Stay at least 1.5" from the AVF anastomosis
- The arterial and venous needles need to be 1" to 1.5" apart
- Avoid curves, flat spots, and aneurysms to prevent complications

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## Site Preparation

- Dialysis patients have more *Staphylococcus* spp (SA and MRSA) on their skin and in their nares (nose) than the general population
- Dialysis staff can also have a higher rate of staph carriage
- Common route of transmission of staph is from the nose to the skin to the vascular access = infection

SA: *Staphylococcus aureus*  
MRSA: methicillin-resistant *S aureus*

Kimani E, et al. *Arch Intern Med.* 1978;138:1657–1659.  
Boelaert JR. *J Chemother.* 1994;6:19–27.  
Yu VL, et al. *N Engl J Med.* 1986;315:91–96.

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## Skin Preparation

- If possible, the patient should wash the access with antibacterial soap before coming to the chair
- Staph is the leading cause of infection in dialysis patients



Photo courtesy of L. Ball

Boyce JM, Pittet D. Guidelines for hand hygiene in health-care settings. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5116a1.htm>. Accessed April 28, 2006.

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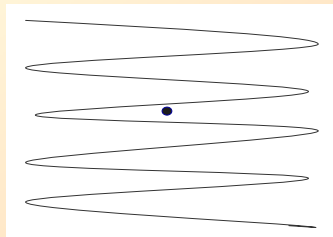
## Skin Preparation (cont'd)

- Proper needle-site preparation by both the patient and staff reduces infection rates
- Once the skin site is properly cleansed, the skin should not be touched with bare hands or gloved hands
  - If touched, re-prep the skin
- All site selection should be done prior to the final skin preparation

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## Applying Chlorhexidine Gluconate

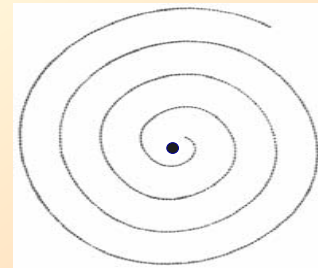
- Wet insertion site for 30 sec
- Allow to air-dry for ≈30 sec
- Do not blot or wipe



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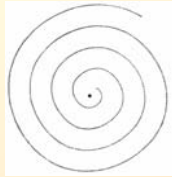
## Applying Sodium Hypochlorite

- Saturate sterile gauze pad
- Clean sites with circular motion
- Wait 2 minutes before proceeding



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## Proper Cleansing Technique



- Proper needle-site preparation reduces infection rates
- Start where you are going to place the needle (the black dot) and cleanse in a circular, outward motion
- Do not touch skin after cleansing area

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## Says Who?

### KDOQI Says:

For all vascular accesses, aseptic technique should be used for all cannulation and catheter accession procedures (evidence)

National Kidney Foundation. *Am J Kidney Dis.* 2006;48(suppl 1):S1-S322.

1. Locate, inspect and palpate the needle cannulation sites prior to skin preparation. Repeat prep if the skin is touched by the patient or staff once the prep has been applied, but the cannulation not completed.
2. Wash access site using an antibacterial soap or scrub and water.
3. Cleanse the skin by applying 2% chlorhexidine gluconate/70% isopropyl alcohol and/or 10% povidone iodine as per manufacturer's instructions for use.

### Notes:

- 2% chlorhexidine gluconate/70% isopropyl alcohol antiseptic has a rapid (30 s) and persistent (up to 48 hr) antimicrobial activity on the skin. Apply solution using back and forth friction scrub for 30 seconds. Allow area to dry. Do not blot the solution.

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## Anesthetic Options for Pain Control

- Needle fear and pain with needle insertion are very real issues for many hemodialysis patients
- Various pain-control options can be utilized to make the cannulation procedure less stressful for patients

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## Intradermal Anesthetics

- Lidocaine injected under the skin and above the vessel
- Advantage: Numbs the area prior to the cannulation procedure
- Disadvantages: Can cause scarring, vasoconstriction, keloid formation, burning with injection, and poses a needle-stick risk

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## Topical Sprays

- Topical sprays (ethyl chloride) can be used to numb the skin sites
- Advantage: Noninvasive method of numbing the skin
- Disadvantages: Nonsterile, requires patient-specific bottle to prevent cross-contamination, may discolor or damage skin with long-term use, flammable contents in bottle
- Method: Spray arterial site, prep skin, then insert needle immediately; repeat for venous site

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## Topical Creams

- Topical creams contain lidocaine and may be applied by the patient at least 1 hour prior to treatment
- Advantage: Provides numbing to a larger cannulation area
- Disadvantages: Cost of the medication, causes vasoconstriction, need to educate patient on the amount needed because using too much cream may lead to vasodilatation up to 3 hours into the dialysis treatment
- Must wash the skin prior to the application of the cream as well as before prep for needle cannulation

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## Using Topical Creams

- Wash skin first
- Apply 1 hour before dialysis
- Cover with plastic wrap
- Prior to cannulation, remove cream, wash/prep skin

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## Tourniquet Use

- Tourniquet required for all cannulations
- Apply tightly enough to engorge vessel

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