Infection Prevention and the Buttonhole Technique?

Lynda K. Ball, MSN, RN, CNN
Types of Infections Reported

- **Staph aureus**:
  - septic arthritis
  - endocarditis
  - mitral valve replacement

- **Staph lugdunensis**:
  - coagulase-negative staph
  - endocarditis
  - vegetation on pulmonary valve

- **MRSA**

- **Clostridium perfringens**

- **Staph epidermidis**

1. Marticorena et al., 2006
2. Arduino (CDC) personal correspondence, 2008
3. van Loon et al., 2009
Why You Meet Resistance

- Manipulating the needle
- Patient drinks excessively (“after the weekend” effect)
- Tourniquet vs. no tourniquet
- Patient with vomiting and diarrhea

** dashed line – correct tunnel position
solid line – displaced buttonhole tunnel
Manipulating Needles

~Causes cone-shaped tunnel or formation of multiple tunnels (A)

~Encourages staff to use their own angle of insertion

~Causes larger-than-normal scabs (brick-colored line A vs. B)

~Can lead to exit site, and tunnel infections
Best Demonstrated Practice

*Touch Cannulation Technique*

- Allows the needle to direct the needle down the buttonhole, and not the cannulator
- Hold the tubing with thumb and forefinger just behind the wings


Photo used with permission
Use of Sharp Needles

✓ Once you transition to blunt needles you NEVER go back to a sharp needle down the tunnel

✓ We now know that using sharps long-term is causing scarring to the tunnel, and should therefore be discouraged – use Best Demonstrated Practices
Infection: A Big Problem…

Localized

- Improper skin cleansing
- Improper scab removal

Courtesy of Dr. Tony Samaha
Cannulation – Site Preparation

<table>
<thead>
<tr>
<th>Cleansing Agent</th>
<th>Contact Time</th>
<th>Cannulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betadine®</td>
<td>3 minutes</td>
<td>When dry</td>
</tr>
<tr>
<td>ExSept®</td>
<td>2 minutes</td>
<td>When dry</td>
</tr>
<tr>
<td>ChloraPrep®</td>
<td>30 seconds</td>
<td>When dry</td>
</tr>
<tr>
<td>Alcohol</td>
<td>60 seconds each site</td>
<td>Immediately after applying</td>
</tr>
</tbody>
</table>

http://www.nwrenalnetwork.org/fist1st/cleanaccess.pdf
Patient’s Role - Infection Control

- CDC–Staph leading cause of infection in dialysis
- Reduces excess staph
- Make it an expectation in your facility
Do’s and Don’ts of Scab Removal

- Don’t flip the scab off with the needle you will use for cannulation – this contaminates the needle.
- Don’t use a sterile needle – you could cut the patient’s skin.
- Don’t let patients pick off their scabs.
- Don’t stick through scabs.

- Do use either:
  - aseptic tweezers;
  - soak two 2 x 2s with NS or alcohol-based gel;
  - place a warm, moist washcloth over sites;
  - stretch skin around scab in opposite directions;
  - have patient tape alcohol squares over sites prior to dialysis.
  - scab lifting devices
Best Demonstrated Practice

2-Step Skin Cleaning Protocol for the Buttonhole Technique

- The patient should wash their arm immediately before the cannulation procedure.
- **Step 1:** Cleanse the needle sites prior to scab removal with an antimicrobial agent
- Remove the scabs
- **Step 2:** Re-prep the needle sites with an antimicrobial agent
- Cannulate
## Two-Step Cleaning Protocol for Buttonhole Sites
Prior to Cannulation to Prevent Infections

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Rationale</th>
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<tbody>
<tr>
<td>1. Have the patient wash their access arm before coming to their dialysis chair.</td>
<td>1. Dialysis patients have more staph on their skin than those without kidney failure. <em>Staph aureus</em> is the leading cause of infection in dialysis patients(^1).</td>
</tr>
<tr>
<td>2. Using your facility’s antimicrobial agent, cleanse the buttonhole sites, using a circular rubbing motion.</td>
<td>2. Pre-cleaning buttonhole sites will continue to reduce <em>Staph aureus</em> and help to prevent infection.</td>
</tr>
<tr>
<td>3. Remove the scabs from the buttonhole sites using an appropriate technique.</td>
<td>3. Scabs contain <em>Staph aureus</em> as well as the skin. See attached guide for “Dos &amp; Don’ts of Scab Removal.”(^2)</td>
</tr>
<tr>
<td>4. Using your facility’s antimicrobial agent, cleanse the buttonhole sites and leave on according to the manufacturer’s recommendation.</td>
<td>4. KDOQI™ 2006 Vascular Access Guidelines(^3) states to follow manufacturer’s guidelines for correct contact time. See attached guide “Preparing the Vascular Access for Cannulation.”(^4)</td>
</tr>
<tr>
<td>5. Cannulate per facility policy while maintaining sterility of the needles.</td>
<td>5. Contaminated needles and improper needle insertion can lead to tunnel infections and/or sepsis.</td>
</tr>
</tbody>
</table>

Infection: A Bigger Problem…

Tunnel/Systemic

• Contaminated needle
• Improper cannulation of the track

Courtesy of Dr. Tony Samaha
Down the Tunnel

~Not following the originator’s angle of entry.

~Not holding the skin taut every cannulation

~Creates pockets that can allow bacteria and blood to collect, which can cause a tunnel infection.
Serious Consequences

- Limbs have been lost
- Patients have died
- Accesses have been lost
Hubbing - What’s This?

Photos: Stuart Mott
Preventing “Hubbing”

- Leave space between the hub and the skin to prevent the bowl effect called “hubbing”

(Ball & Mott, in press)

Photo: Stuart Mott
Selection Criteria?

Co-Morbid Conditions
- Endocarditis
- Valve replacements
- Lupus
- Chronic antibiotic user

Other Issues
- Patients who pick scabs
- Return from failed transplant
- Those taking prednisone
Do We Need to Mask?

Do you check patients for nasal staph?

Are staff checked for nasal staph?

Infections are mimicking those of catheters…

Exit site
Tunnel
Septicemia
Questions?

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www.nwrenalnetwork.org/QI/QI.htm

For more resources, including the national AVF cannulation video: www.fistulafirst.org; cannulation is Change Concept #8