HEMODIALYSIS CATHETERS - ANY CHANGES FOR 2018?

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OBJECTIVES:

• 1. IDENTIFY ONE NEW HEMODIALYSIS CATHETER CARE PRACTICE
• 2. EVALUATE THE ABILITY TO INTEGRATE THIS PRACTICE IN YOUR SETTING
• DISCLOSURES – NO CONFLICT OF INTEREST
Figure 4.1 Vascular access use at hemodialysis initiation, from the ESRD Medical Evidence form (CMS 2728), 2005-2013

Data Source: Special analyses, USRDS ESRD Database. Abbreviations: AV, arteriovenous; CMS, Centers for Medicare & Medicaid; ESRD, end-stage renal disease.
Figure 4.2 Geographic variation in percentage of catheter-only use at hemodialysis initiation, from the ESRD Medical Evidence form (CMS 2728), 2013

Data Source: Special analyses, USRDS ESRD Database. Abbreviations: AV, arteriovenous; CMS, Centers for Medicare & Medicaid; ESRD, end-stage renal disease.
Figure 4.4  Geographic variation in percentage catheter use among prevalent hemodialysis patients by Health Service Area, from CROWNWeb data, December 2013

Data Source: Special analyses, USRDS ESRD Database. Abbreviation: ESRD, end-stage renal disease
Figure 4.6 Trends in vascular access type use among ESRD prevalent patients, 2003-2014

Data Source: Special analyses, USRDS ESRD Database. Abbreviations: AV, arteriovenous; CMS, Centers for Medicare & Medicaid; ESRD, end-stage renal disease.
Figure 4.7 Vascular access use during the first year of hemodialysis by time since initiation of ESRD treatment, among patients new to hemodialysis in 2013, from the ESRD Medical Evidence form (CMS 2728) and CROWNWeb data, 2013-2014

Data Source: Special analyses, USRDS ESRD Database. Abbreviations: AV, arteriovenous; CMS, Centers for Medicare & Medicaid; ESRD, end-stage renal disease.
HEMODIALYSIS CATHETER PROBLEMS

- INFECTIONS:
  - EXIT SITE
  - TUNNEL
  - CATHETER-RELATED BACTERMIA
EXIT SITE INFECTION

CDC—Erythema or induration within 2 cm of the catheter exit site, in the absence of concomitant BSI and without concomitant purulence
Exit Site Infection
TUNNEL INFECTION

CDC—Tenderness, erythema, or site induration >2 cm from the catheter site along the subcutaneous tract of a tunneled catheter, in the absence of concomitant BSI.
RISK FACTORS FOR CATHETER RELATED BLOOD STREAM INFECTION

Submaximal barrier precautions at the time of catheter insertion

Nontunneled catheter

Site of insertion – femoral > internal jugular > subclavian

Prolonged duration of catheter use

Previous episode of CRBSI

Diabetes/ Hypoalbuminemia

Recent surgery

Staphylococcus aureus in nasal carriage
INFECTIONS: HOW TO PREVENT?

• PROPER ASEPTIC CARE – INCLUDING STAFF HAND WASHING
• CHLORHEXADINE (CHG)- USE TO CLEAN SITE AND ALLOW TO DRY
• PREVENT HDC MOVEMENT
• REMOVE SUTURES IN ONE MONTH – CONTACT PROVIDER FOR ORDERS IF NEEDED
• BIOPATCH? DO DRESSINGS MAKE A DIFFERENCE?
• SHOWER? CLEANLINESS IS NEXT TO GODLINESS AND IF YOU CAN'T BE GODLY – AT LEAST BE CLEAN
APPROPRIATE HAND WASHING - CDC RECOMMENDATIONS:

• Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.

• Lather your hands by rubbing them together with the soap. Be sure to lather the backs of your hands, between your fingers & under nails.

• Scrub your hands for at least **20 seconds**. Need a timer? Hum the “Happy Birthday” song from beginning to end **twice**.

• Rinse your hands well under clean, running water.

• Dry your hands using a clean towel or air dry them.
PROPER HAND SANITIZER USE

• **WASHING** HANDS WITH SOAP AND WATER IS THE BEST WAY TO REDUCE THE NUMBER OF MICROBES ON THEM IN MOST SITUATIONS. IF SOAP AND WATER ARE NOT AVAILABLE, USE AN ALCOHOL-BASED HAND SANITIZER THAT CONTAINS AT LEAST **60% ALCOHOL**.

• **HAND SANITIZER USE**, APPLY THE PRODUCT TO THE PALM OF ONE HAND AND RUB THE PRODUCT ALL OVER THE SURFACES OF YOUR HANDS UNTIL YOUR HANDS ARE DRY.

• **ALCOHOL-BASED** HAND SANITIZERS CAN QUICKLY REDUCE THE NUMBER OF MICROBES ON HANDS IN SOME SITUATIONS, BUT SANITIZERS DO NOT ELIMINATE ALL TYPES OF GERMS.

• **HAND SANITIZERS** MAY NOT BE AS EFFECTIVE WHEN HANDS ARE VISIBLY DIRTY OR GREASY. SANITIZERS WITH CHG ARE LONGER ACTING AND MORE EFFECTIVE THAN ALCOHOL- BASED SANITIZERS.
CHG USE – WHAT ARE THE FACTS

• One 2002 meta-analysis (8 randomized trials and 4,143 short-term catheters) found that CHG solutions either in aqueous or alcoholic formulations significantly reduced catheter-related bloodstream infections by approximately 50% (RR, 0.51 (95% CI, 0.27-0.97)) compared to 10% for aqueous povidone iodine.

• The superiority of chlorhexidine has a synergistic effect with alcohol, which has also been demonstrated with povidone iodine.

• The superiority of chlorhexidine over povidone iodine has been linked to quick bactericidal activity, poor inactivation by blood and other protein-rich biomaterials present on skin, and long-term antimicrobial suppressive activity.

• In addition, skin scrubbing reduces bacterial load and the amount of protein-rich biomaterials present on skin and may thereby enhance the efficacy of antiseptics.
WHAT DO YOU THINK THIS IS?

EXIT SITE INFECTION? ALLERGY? NOT ALLOWING SITE TO DRY PRIOR TO APPLYING DRESSING?
Exposed Cuff

Preventing HD Catheter Movement

A: The image shows a catheter with an exposed cuff that can be easily pulled out and lead to loss of a vital vascular access site. The exposed catheter cuff would suggest that the tip is no longer at the proper location and delivery of blood through this catheter may not be adequate. The replacement of the catheter over a guide wire can be easily performed with proper anchoring, and the patient can return for dialysis therapy on the same day.

B: Disrupted subcutaneous tunnel (arrowheads) with exposed catheter cuff at the exit site.
Note the difference in the HDC appearance?
HOW TO PREVENT HDC MOVEMENT?

Note – if using gauze under a transparent dressing, then HDC dressing must be changed every HD visit. To have every 7 day HDC dressing change, apply transparent dressing only.

• DRESSINGS THAT HAVE ADHESIVE/TAPE AROUND TIPS (TRANSPARENT, ISLAND TYPE DRESSINGS)

• IF A WOMAN, CAN TUCK THE TIPS OF THE HDC INTO A BRA (ESPECIALLY NIGHT TIME).

• PATIENT WEAR A SNUG T-SHIRT TO KEEP THE HDC TIPS FROM MOVEMENT AND PREVENT HDC FROM BEING TUGGED.
Exposed Cuff and Overly White HD Catheter – which is classically seen with HD catheter migration
HDC SUTURES REMOVAL:

Delayed removal of sutures may cause a localized infection.

The dacron (fibrous) cuff is usually adherent 3 weeks after insertion but can take up to 8 weeks in patients receiving corticosteroids.

The exit-site (anchor) suture can often be removed after 3 weeks for most catheters (refer to specific catheter monograph), but again practice between centers may vary.
Sutures still in place - is this exit site or tunnel infection?
DO SPECIAL DRESSINGS OR BIOPATCHES REDUCE INFECTION?

• A 2014 meta-analysis stated: there is little or no advantage to using a chlorhexidine-impregnated dressing on a catheter in place beyond 14 days. The benefits of chlorhexidine-impregnated dressings or biopatch would not be expected to have as much impact CRBSI rates when the intraluminal route is the primary source of infection, as is the case with long-term devices and any CVC after the first or second week of insertion with routine dressing changes.

• There are no definitive recommendations for the optimal dressing or frequency of change for hemodialysis catheters. Dressings may be sterile gauze or sterile transparent cam be used. Both patient and environmental factors should be considered when selecting dressing type. Dressings should not be submerged in water. Dressings should be changed when they become damp, loose, soiled, nonocclusive, or nonadherent, and only trained dialysis staff should change catheter dressings.

• No dressing coverage (over healed tunneled HDC) has been research without an increase in infections (2014).
• No dressing coverage (over healed tunneled HDC) has been researched without an increase in infections (2014).
SHOWERING AND INFECTION RISK – 77% OF HEMODIALYSIS PATIENTS (WITH HDC) SHOWER ALREADY

- The "shower and no-dressing" technique appears to be a safe CVC dressing option with improved quality of life, no increase in infection rates & cost-effective.

- This has now been shown in 3 published studies (2014, 2017). The 2017 study had patients place a dressing on their HDC site after showering.

- Must only allow showering with fully mature tunneled hemodialysis catheter sites. Some patients do not have a fully mature tunneled HDC even at 6 weeks post insertion.

- Need to educate patients on safe showering techniques.
No Dressing Coverage
Catheter hubs are not water tight – see picture that allowed colored fluid to seep into catheter while injecting with syringe/needle.

This means that hub could potentially allow shower water to seep into hub and enter the blood stream.
TUNNEL INFECTION
Palindrome HD catheter – note the tan colored catheter
Patient with underlying dementia cut his own HD catheter with scissors. Luckily the patient had no problems from this.
Old HD catheter removal due to tunnel infection. New HD catheter being placed in new tunnel.
SIGNS AND SYMPTOMS OF CATHETER RELATED BACTEREMIA

• IS FEVER ALWAYS PRESENT?

• ARE SHAKING CHILLS ALWAYS PRESENT?

• DOES THE CATHETER SITE ALWAYS LOOK BAD OR DIFFERENT?

• DOES THE PATIENT ALWAYS LOOK SICK?

• WHEN TO CONSIDER CATHETER RELATED BACTEREMIA?
SYMPTOMS OF CATHETER RELATED BLOOD STREAM INFECTION (CRBSI)
## THE ORGANISMS RESPONSIBLE FOR HD CRBSI:

<table>
<thead>
<tr>
<th>Organism</th>
<th>Percentage reported</th>
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</thead>
<tbody>
<tr>
<td><strong>Gram-positive cocci</strong></td>
<td></td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>22-60%</td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>0-13%</td>
</tr>
<tr>
<td>Methicillin-resistant Staphylococcus aureus</td>
<td>6-29%</td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
<td>2-18%</td>
</tr>
<tr>
<td><strong>Gram-negative bacilli</strong></td>
<td></td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>2-15%</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>9%</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>10%</td>
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<tr>
<td>Acinetobacter species</td>
<td>13%</td>
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<tr>
<td>Serratia marcesens</td>
<td>1-2%</td>
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<tr>
<td>Klebsiella pneumoniae</td>
<td>6%</td>
</tr>
<tr>
<td>Polymicrobial</td>
<td>16-20%</td>
</tr>
<tr>
<td>Acid-fast organisms</td>
<td>Rare</td>
</tr>
<tr>
<td>Fungi</td>
<td>Rarely reported</td>
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</table>
Chlorhexidine impregnated caps have not been shown to make a difference but scrubbing the hub makes a big difference and limiting times when opening the hubs—such as using Tego—type caps.
Scrub-the-Hub Protocol

This protocol outlines a suggested approach to preparing catheter hubs prior to accessing the catheter for hemodialysis. It is based on evidence where available and incorporates theoretical rationale when published evidence is unavailable.

Definitions:
- **Catheter** refers to a central venous catheter (CVC) or a central line
- **Hub** refers to the end of the CVC that connects to the blood lines or cap
- **Cap** refers to a device that screws on to and occludes the hub
- **Limb** refers to the catheter portion that extends from the patient's body to the hub
- **Blood Lines** refer to the arterial and venous ends of the extravascular circuit that connect the patient's catheter to the dialyzer.

Connection Steps:
1. Perform hand hygiene and don new clean gloves.
2. Clamp the catheter (Note: Always clamp the catheter before disconnecting. Never leave an uncapped catheter unattended).
3. Disinfect the catheter hub before applying the new cap using an appropriate antiseptic (see notes).
   a. (Optional) Disinfect the connection prior to disconnection. If this is done, use a separate antiseptic pad for the subsequent disinfection of the hub.
   b. Disconnect the blood line from the catheter and disinfet the hub with a new antiseptic pad. Scrub the sides (threads) and end of the hub thoroughly with friction, making sure to remove any residue (e.g., blood).
   c. Use a separate antiseptic pad for each hub. Leave hubs "open" (i.e., uncapped and disconnected) for the shortest time possible.
4. Always handle the catheter hubs aseptically. Once disinfected, do not allow the catheter hubs to touch nonsterile surfaces.
5. Attach sterile syringes, unclamp the catheter, withdraw blood, and flush per facility protocol.
6. Repeat for other limb (this might occur in parallel).
7. Connect the ends of the blood lines to the catheter aseptically.
8. Remove gloves and perform hand hygiene.

Disconnection Steps:
1. Perform hand hygiene and don new clean gloves.
2. Clamp the catheter (Note: Always clamp the catheter before disconnecting. Never leave an uncapped catheter unattended).
3. Disinfect the catheter hub before applying the new cap using an appropriate antiseptic (see notes).
4. Always handle the catheter hubs aseptically. Once disinfected, do not allow the catheter hubs to touch nonsterile surfaces.
5. Attach sterile syringes, unclamp the catheter, withdraw blood, and flush per facility protocol.
6. Repeat for other limb (this might occur in parallel).
7. Connect the ends of the blood lines to the catheter aseptically.
8. Remove gloves and perform hand hygiene.

Hand hygiene.

Clean gloves each time.

Clamp catheter—should be clamped all the time when not in use.

Scrub the cap before removing. Scrub the hub after cap removed.

Scrub thoroughly—5 seconds friction.

Then scrub up the catheter to patient.

Allow antiseptic to dry.

Never let hub to touch nonsterile surfaces.
Use antiseptic for scrub the hub. Sterile alcohol is ok.

Soaking the caps not recommended by CDC.

Handle HDC hubs aseptically.

Disinfect HDC hubs after disconnecting from blood lines.

Use caution if securing caps with tape – d/t adhesive residue.

Masks – evidence is lacking; but are still recommended.

PPE should always be worn when connecting or disconnecting HDC.

Use caution to not contaminate cleaned hubs, gloves or any clean surface.
One study evaluated the time effect of alcohol disinfection duration on bacterial load on catheter hubs.

3, 10 and 15 seconds were analyzed as the time for “scrub the hub” technique.

Results: disinfection duration no significant difference bacterial load.

Further studies are needed to accurately state the specific time for “scrub the hub” technique.

At this time, refer to your particular dialysis center policy for the time frame for “scrub the hub”.

"SCRUB THE HUB": CLEANING DURATION AND REDUCTION IN BACTERIAL LOAD ON CENTRAL VENOUS CATHETERS
Dialysis Outcomes Practice Patterns study (DOPPS) note a 46% increase in catheter-related septicemia during summer months when higher heat and humidity cause an increase in perspiration and bacterial growth with biofilm production.
A retrospective analysis of elderly patients (mean age: 81.9 years) when compared to younger patients (mean age: 54.8 years) with similar HDC and care had a significantly lower rate of CRBSI.

These results could be explained by decreased skin and nasal colonization rates in the elderly, decreased physical activity resulting in less mechanical stress on the catheter.
WHAT CAUSES THE DYSFUNCTION IN CHRONIC HEMODIALYSIS CATHETERS?

- DYSFUNCTION - THOUGHT TO AFFECT 30% OF CVCS
  - THROMBOTIC VS NON-THROMBOTIC
  - PARTIAL, COMPLETE OR WITHDRAWAL
  - MECHANICAL COMPRESSION: PINCH OFF VS KINK MEMORY FROM CLAMP
  - DRUG PRECIPITATE
  - BLOOD REFLUX - DOES THIS CAUSE THE FIRST 2 LISTED CAUSES?
HEMODIALYSIS CATHETER DYSFUNCTION: SIGNS

- FREQUENT ALARMS
- INADEQUATE KT/V (ADEQUACY)
- UNABLE TO ASPIRATE – BUT CAN INSTILL NORMAL SALINE (WITHDRAWAL OCCLUSION)
- POOR FLOW (ARTERIAL PRESSURE OVER 250)
- NO FLOW
- CATHETER CUFF EXPOSURE/MIGRATION
- ACCIDENTAL DISLODGEMENT
RECOMMENDATION 2: IF CVC DYSFUNCTION IS IDENTIFIED, RULE OUT CAUSES OTHER THAN THROMBOSIS AS THE SOURCE OF THE DYSFUNCTION.

CAUSES OF CVC DYSFUNCTION OTHER THAN THROMBOSIS”

- MECHANICAL REASONS, KINKS (ANGULATION IN TUNNEL), MISPLACED SUTURES, CATHETER MIGRATION
- DRUG PRECIPITATION (SOME ANTIBIOTIC LOCKS OR IV IGG)
- HYPOVOLEMIA
- PATIENT POSITION
- CATHETER INTEGRITY, HOLES AND CRACKS (KDOQI; 2006).
- SUCH CAUSES NEED TO BE RULED OUT PRIOR TO THE USE OF THROMBOLYTICS.
DOES THE HD CATHETER SOLUTION OR ADMINISTRATION TECHNIQUE MAKE A DIFFERENCE?

• IT MAKES A difference in the following:
  • THROMBOTIC -- YES
  • PARTIAL, COMPLETE OR WITHDRAWAL -- YES
  • BLOOD REFLUX – YES
• Instillation of heparin at high concentration in the lumens of tunneled central venous catheters (catheter lock) at the end of hemodialysis (HD) sessions is the currently adopted practice among dialysis centers and nephrologists.

• Studies examining the optimal catheter lock heparin concentration are limited. Furthermore, none of the solutions commonly used to lock HD catheters are currently approved by the FDA for this purpose, resulting in a lack of manufacturer’s recommendations for catheter locking.

NORMAL SALINE VERSUS HEPARIN FOR PATENCY OF CENTRAL VENOUS CATHETERS IN ADULT PATIENTS - A SYSTEMATIC REVIEW AND META-ANALYSIS- 2017

• NORMAL SALINE CAN BE EQUALLY, IF NOT MORE EFFECTIVE, IN KEEPING THE CENTRAL VENOUS CATHETERS (CVCS) OPEN.

• HEPARIN SIDE EFFECTS: HEPARIN-INDUCED THROMBOCYTOPENIA, HEMORRHAGE

• HEPARIN OR HEPARINIZED SALINE WAS SHOWN NOT TO BE SUPERIOR TO NON-HEPARINIZED SOLUTION IN LONG-TERM CVC PATENCY.

• BUT….. NOT EVALUATED IN HEMODIALYSIS CATHETERS.
• All central venous catheters (non-Groshong) have the same technique for administering the locking solution and clamping.

• The only difference among CVcs is why they are used and what is administered in them.

• My thought – a CVC is a CVC and a hemodialysis catheter is a CVC.
End Caps – Flushing Procedure

- Flush a peripheral IV catheter per manufacturer’s recommendations with preservative free normal saline (2 mL).
  - Every 12 hours or as ordered
  - Before giving medications
  - After giving medications
  - After intermittent IV therapy
- Always flush with saline immediately after blood infusion or sampling using a push-pause technique to clear the valve.
- Flush positive pressure valves until clear.
- When flushing positive pressure valves, disconnect syringe, then clamp.
  - Do not clamp before detaching syringe.
  - Clamp after detaching the syringe.
TYPES OF HD CATHETER THROMBOSIS/CLOTS:

- Fibrin sheath
- Intraluminal clot
- Mural thrombosis
- Venous thrombosis
HOW ACTIVASE WORKS IN THE HD CATHETER:

Alteplase works by binding to fibrin in a thrombus, then converting the entrapped plasminogen to plasmin which results in local fibrinolysis (i.e. digests fibrin and dissolves blood clot).
ACTIVASE (TPA, CATHFLO) FOR OCCLUDED OR DYSFUNCTIONAL HD CATHETER METHODS OF ADMINISTRATION:

• PUSH PAUSE METHOD

• SHORT DWELL METHOD

• LONG DWELL (OVERNIGHT) METHODS

• SIMULTANEOUS INFUSION METHOD VIA ARTERIAL AND VENOUS LUMENS PRIOR TO INITIATING HEMODIALYSIS – OVER 30 MINUTES

• SINGLE LUMEN INFUSION METHOD DURING DIALYSIS – OVER 60 MINUTES
PUSH/PAUSE METHOD:

- Instill pre-mixed alteplase 1 mg *OR* 2 mg into each catheter lumen.
- Instill Normal Saline (NS without preservative) to fill the internal volume of each lumen plus 0.1 mL overfill.
- Wait 10 minutes, then gently push NS 0.3 mL into catheter lumen.
- Wait another 10 minutes, then repeat NS 0.3 mL push.
- Wait another 10 minutes, then aspirate clots using a 10 mL syringe and discard.
- May push remaining alteplase if unable to withdraw. ?? Forcefully flush each catheter lumen as per protocol. Use push-pause flush technique.
RECONSTITUTION INSTRUCTIONS FOR PUSH/PAUSE AND DWELL INSTILLATION METHODS FOR 1MG/ML CONCENTRATION:

1. USING ASEPTIC TECHNIQUE, WITHDRAW 2.2 ML OF STERILE WATER FOR INJECTION. DO NOT USE BACTERIOSTATIC WATER FOR INJECTION FOR RECONSTITUTION.

2. INJECT THE 2.2 ML OF STERILE WATER FOR INJECTION INTO THE ALTEPLASE 2 MG VIAL, DIRECTING THE DILUENT STREAM INTO THE POWDER. SLIGHT FOAMING IS NOT UNUSUAL; LET THE VIAL STAND UNDISTURBED TO ALLOW LARGE BUBBLES TO DISSIPATE.

3. MIX BY GENTLY SWIRLING UNTIL THE CONTENTS ARE COMPLETELY DISSOLVED. DO NOT SHAKE. THE RECONSTITUTED PREPARATION RESULTS IN A COLORLESS TO PALE YELLOW TRANSPARENT SOLUTION CONTAINING ALTEPLASE 1 MG/ML.

4. WITHDRAW PRESCRIBED AMOUNT OF ALTEPLASE 1 MG (1 ML) OR 2 MG (2 ML) OF SOLUTION FROM THE RECONSTITUTED ALTEPLASE VIAL.
ACTIVASE USE (TPA, ALTEPLASE, THROMBOLYTICS)

• SHORT TERM SUCCESS RATES: 59-100%

• THE TIME FRAME TIL THE NEXT DOSE OF ACTIVASE IS NEEDED: 12.5-30 DAYS

• PATENCY RATES RANGED FROM 54 – 60% AT 30 DAYS

• THERE WAS NO CORRELATION BETWEEN THE METHOD OF ACTIVASE USE AND HD CATH FUNCTION

• THERE WAS NO DIFFERENCE IN EFFECTIVENESS BETWEEN USING 1MG OR 2MG IN EACH LUMEN OTHER THAN COST SAVINGS
OTHER AGENTS TO PREVENT HD CATHETER DYSFUNCTION

• ANTIPLATELET AGENT AND SYSTEMIC ORAL ANTICOAGULATION HAVE NOT PROVEN BENEFICIAL IN IMPROVING CATHETER PATENCY AND MAY INCREASE RISK OF BLEEDING.
Fibrin sheaths associated with hemodialysis catheters are very common.

Thrombus formation around the sheath is frequent.

When you see this fibrin sheath which is very common, do you think a dwell which just enter the HD catheter and slight overfill will dissolve this clot?
OTHER METHODS TO REDUCE HD CATHETER CLOTTING

• CLAMPING THE CATHETER WHILE INJECTING THE LAST 0.5 ML RESULTS IN A POSITIVE-END PRESSURE TECHNIQUE WHILE FLUSHING WHICH MINIMIZES BLOOD REFLUX INTO THE LUMEN.

• THE PUSH/PAUSE HD CATHETER FLUSHING TECHNIQUE, RATHER THAN EVEN SYRINGE PRESSURE, IS RECOMMENDED TO CREATE A TURBULENT FLOW.
NORMAL SALINE AS THE FLUSHING AND LOCKING AGENT FOR HD CATHETERS – PROCEDURE

- EQUIPMENT: 2 - 10ML OF NS IN PRE-FILLED SYRINGES, STERILE ALCOHOL WIPES, CAPS (IF ENDING HD)

- PROCEDURE – AFTER SCRUBBING THE HUB WITH STERILE ALCOHOL WIPE (HOW LONG?), INSTILL 10 ML NS USING PUSH-PAUSE TECHNIQUE AND CLAMPING CATHETER DURING THE LAST 0.5ML INSTILLATION. SCRUB HUB AGAIN WITH NEW STERILE ALCOHOL WIPE AND INSTILL THE REMAINDER OF 10ML NS. THIS PROCEDURE IS DONE TO START HD, IF REVERSING LINES, IF PATIENT HAS TO PAUSE DIALYSIS FOR BATHROOM (ETC) AND AT THE END OF HD.

- IF PATIENT HAS CHRONIC ISSUES WITH DYSFUNCTIONAL HD CATHETER, MAY USE 30ML OF NS.
HAS NS AS THE LOCKING AGENT RESULTED IN MORE ACTIVASE USE, MORE HD CATHETER EXCHANGES OR MORE PROBLEMS

• NO. THE PATIENTS WHO HAVE PROBLEM FUNCTIONING HD CATHETERS, CONTINUE TO HAVE PROBLEM HD CATHETERS.

• THE LOCKING AGENT IS NOT THE IMPORTANT PRODUCT, IT IS THE PUSH-PAUSE TECHNIQUE AND POSITIVE CLAMPING.

• PREVENTING BLOOD REGURGITATING INTO THE HD CATHETER IS THE KEY.
ACTIVASE USE AT THE CLINIC THAT HAS BEEN USING NS SINCE JULY 2017

• ONLY ONE PATIENT IN 2017 HAS NEEDED ACTIVASE.

• JANUARY 1 – JUNE 30, 2017 – 5 DOSES AND 1 HDC EXCHANGE

• JULY 1 – DECEMBER 31, 2017 – 4 DOSE AND 1 HDC EXCHANGE

• HIGH RISK FOR DYSFUNCTIONAL HDC – LARGE PATIENTS. CONSIDER REQUESTING LONGER HEMODIALYSIS CATHETERS.
TAKE HOME POINTS:

• HAND HYGIENE – THE MOST IMPORTANT THING THAT YOU CAN DO TO PREVENT INFECTION.

• NEW YEARS RESOLUTION – HAND GEL AND USE GLOVES WHEN YOU TOUCH THE MACHINE

• SCRUB THE HUB – USE STERILE ALCOHOL (BIGGER PAD)

• CONSIDER NO DRESSING COVERAGE AND TEACHING SHOWERING TECHNIQUE FOR PATIENTS WITH PERMANENT CATHETERS

• USE PUSH-PAUSE TECHNIQUE WITH 20 MLS NS TO FLUSH HD CATHETER WITH POSITIVE END CLAMPING. WANT TO PREVENT BLOOD BACKING UP INTO HD CATHETER.

• THIS CAN BE USED WITH HEPARIN AS PACKING AGENT BUT HEPARIN IS AN OFFLABEL PACKING SOLUTION.
THANK YOU

ANY QUESTIONS?