

# SUPERIOR HEALTH Quality Alliance

# Protecting the Patient Lifeline: Dialysis Accesses & Infection Risks

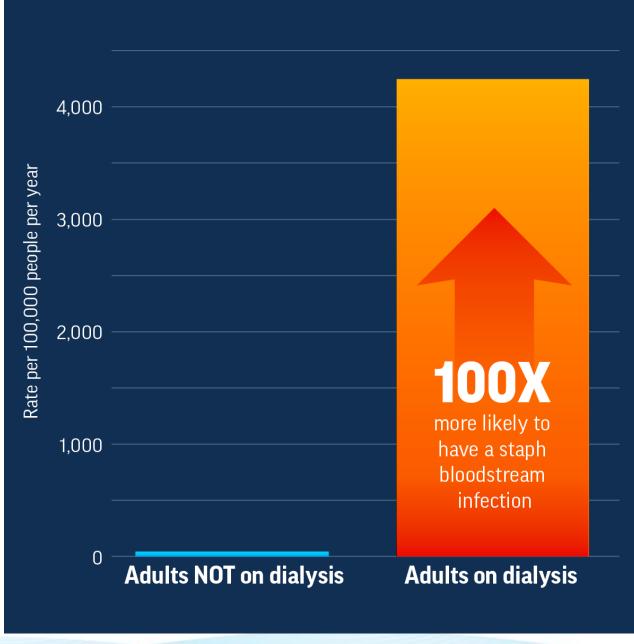
Claire Taylor-Schiller April 2024

# **Objectives**

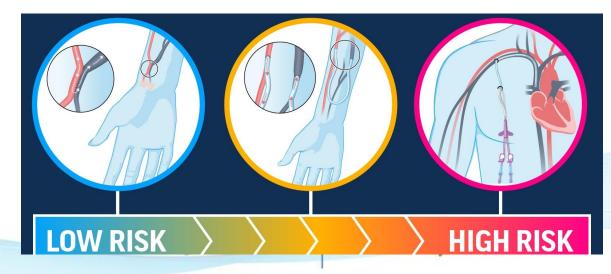
- 1. Describe 3 types of dialysis access
- 2. Describe the risk of infection associated with each dialysis access type
- 3. Identify infection risk mitigation strategies for dialysis accesses
- 4. Describe the impact of infection on Network goals and facility performance scores





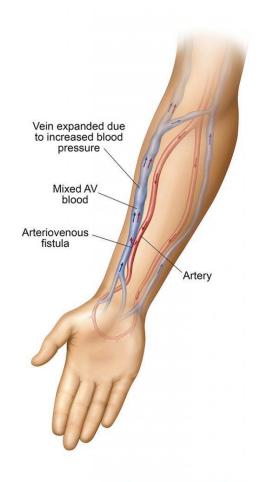


- In 2020: 14,000 BSI in dialysis patients
- More than 1/3 were Staph infections
- The risk is heavily influenced by the type of vascular access
- Literature shows approximately 70% of these infections occur in patients with central venous catheters



From CDC Vital Signs <a href="https://www.cdc.gov/vitalsigns/index.html">https://www.cdc.gov/vitalsigns/index.html</a>

# **AV Fistula**



- Beneath the skin, native vessels
- Long lasting
- Greatest blood flow = better treatment
- Fewest infections, fewest hospitalizations
- Higher survival rate
- May not mature/develop
- Maintenance
- Not always possible
- Time to maturation



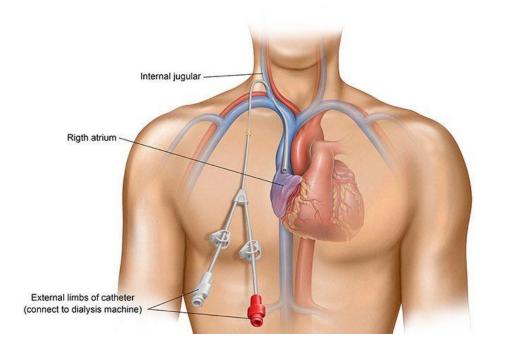
# **AV Graft**



- Beneath the skin
- May work in patients with poor veins
- May be used in 2 weeks
- Higher risk of hospitalizations, infections, complications like clotting
- Not as long lasting as fistula



# **Central Venous Catheter**

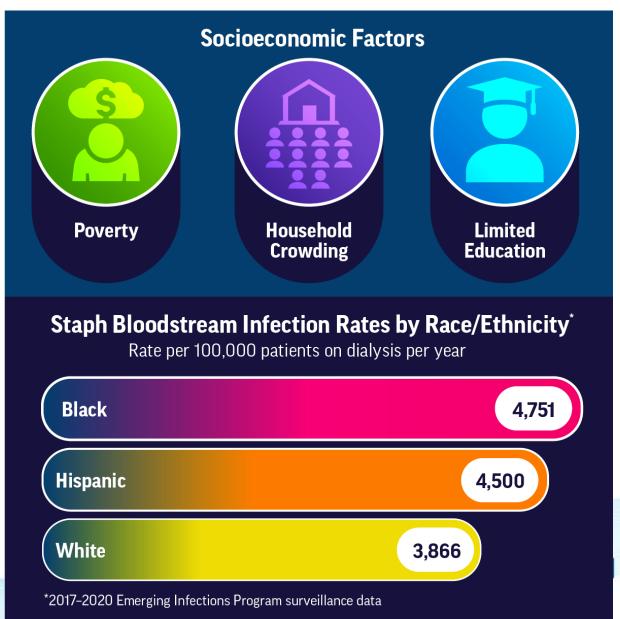


- Can be used immediately
- Highest infection risk and hospitalization risk
- Temporary
- May require longer treatment times
- No showers
- High rate of clotting
- Central stenosis



# **Compounding the Catheter Risk**

- Duration of catheter
- Past bacteremia
- Low albumin
- Immunosuppression



# **Trends in Vascular Access**

Figure 4.1 Vascular access use at HD initiation, 2011-2021

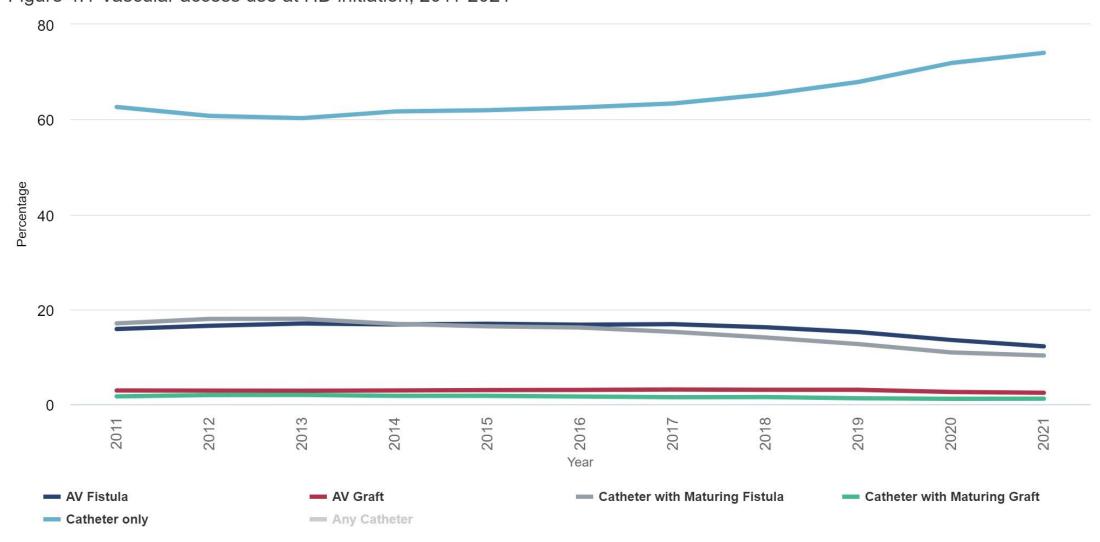


Figure 4.5 Vascular access use among prevalent HD patients, 2012-2021

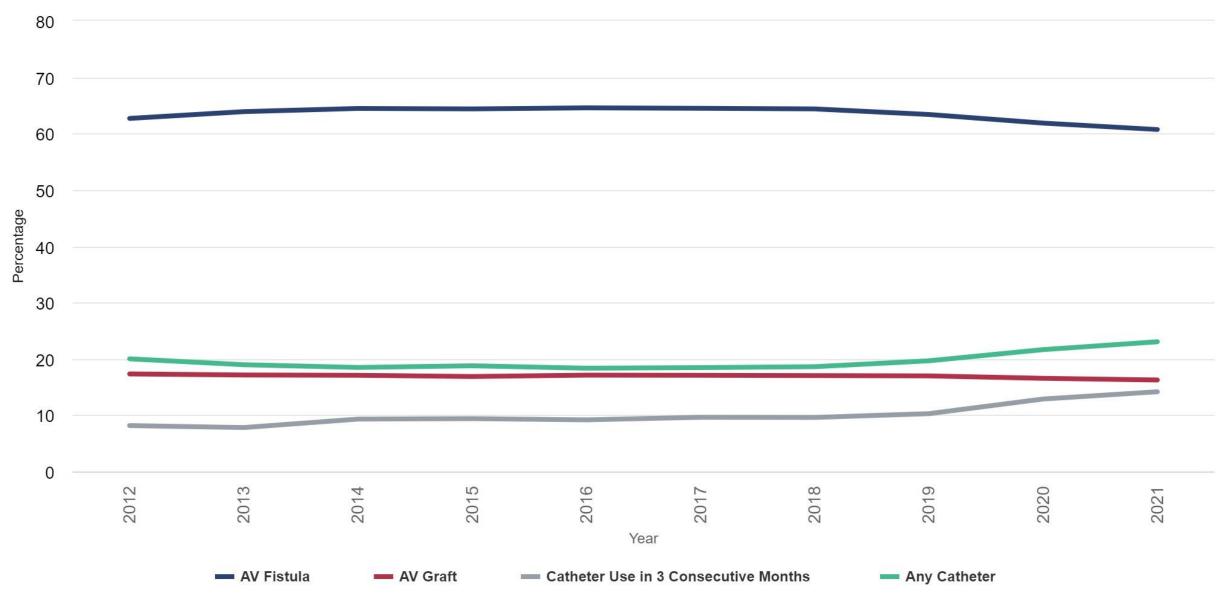


Figure 4.7c Change in vascular access type and other outcomes over the 18 months following HD initiation with a fistula in 2020

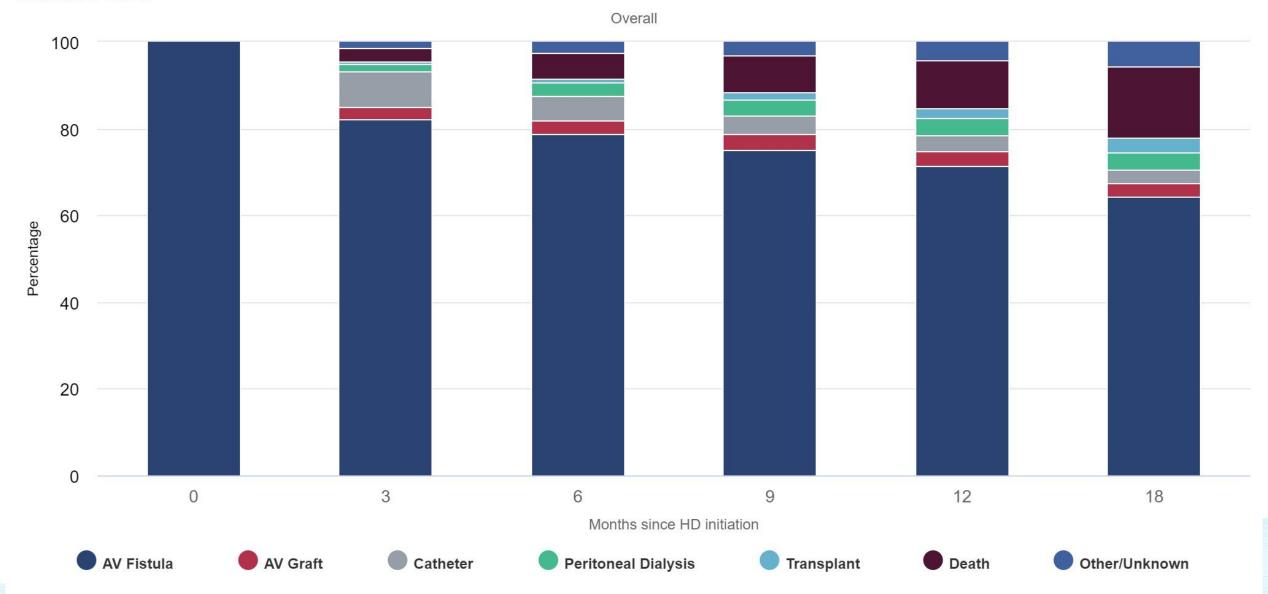


Figure 4.7b Change in vascular access type and other outcomes over the 18 months following HD initiation with a catheter in 2020

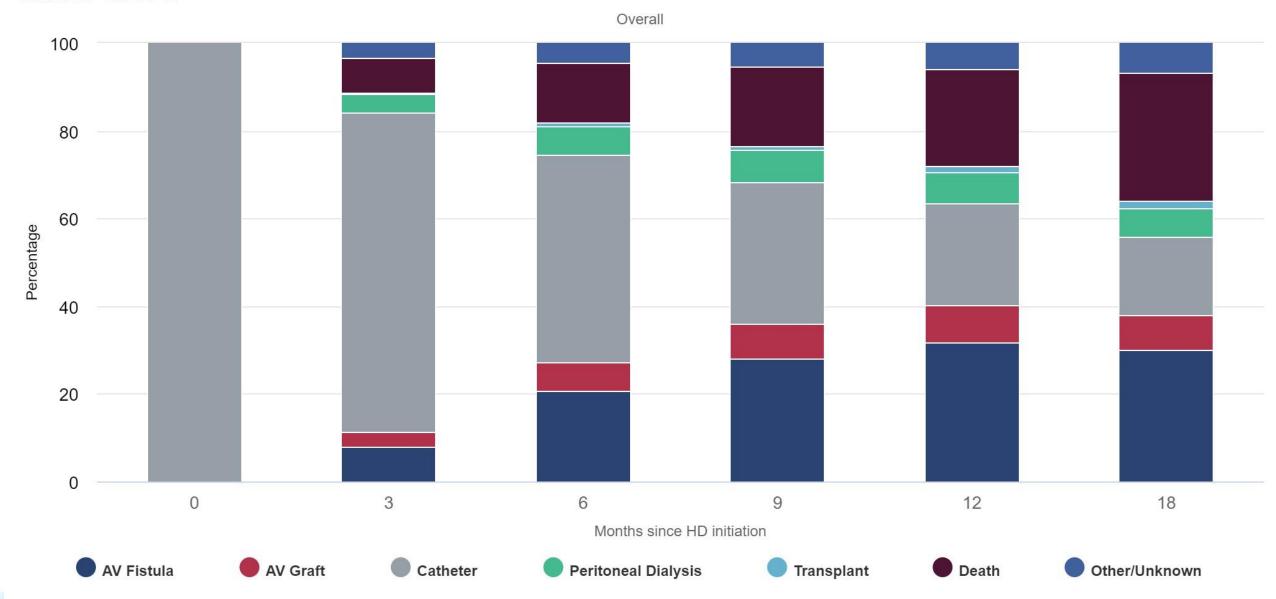
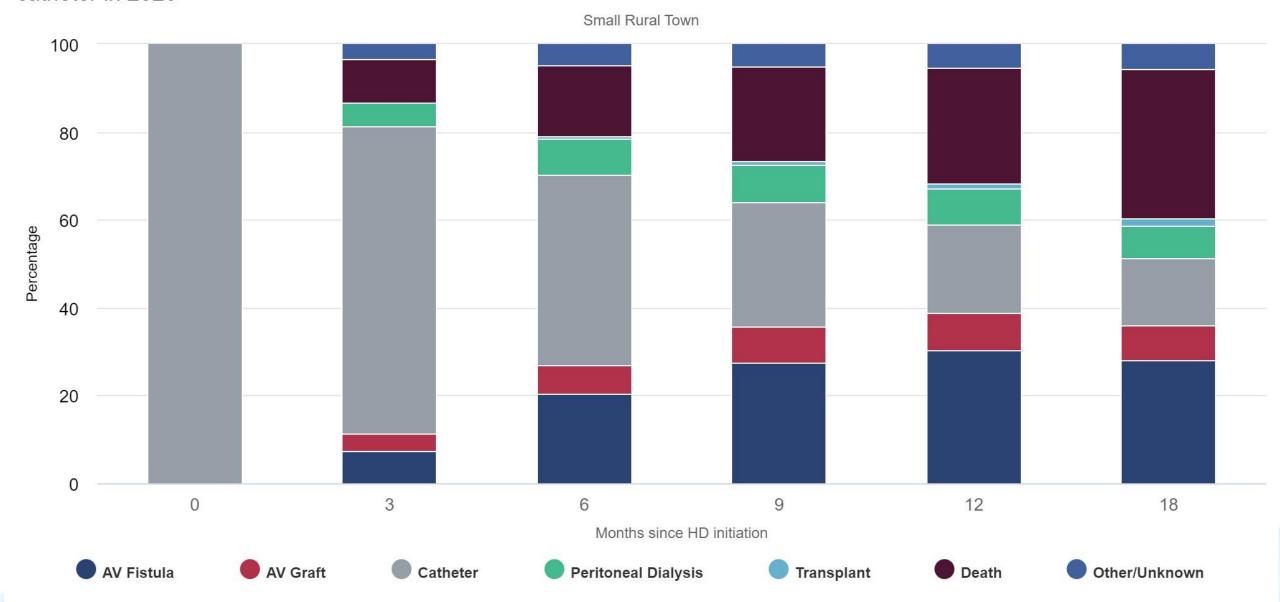


Figure 4.7b Change in vascular access type and other outcomes over the 18 months following HD initiation with a catheter in 2020



# **Related QIP Measures**

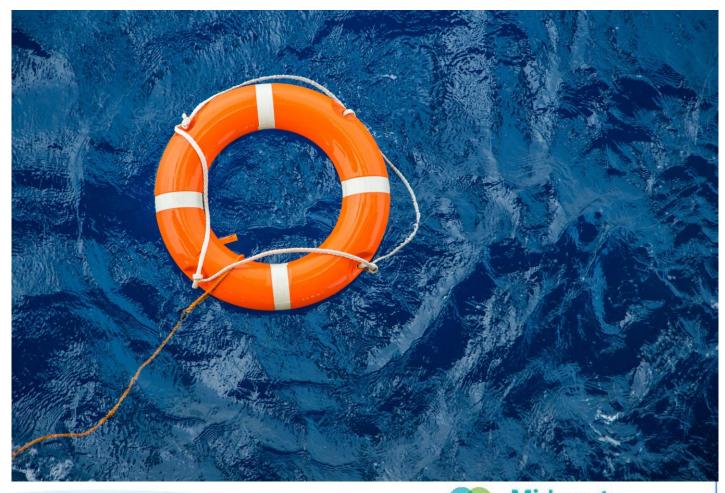
- Bloodstream Infections
- Standardized Hospitalization Ratio
- Standardized Readmission Ratio
- Long-term Catheter Rate



Indirect impacts: Kt/V, Transplant Waitlist Measures



# **Mitigation Strategies**





# We ALL have a Role in Quality Outcomes

Manager

**PCT** 

AA

Physician

Housekeeping

BioMed

Nurse

Social Worker

Dietician

Patient







# **Core Interventions**

# **CDC Approach to BSI Prevention in Dialysis Facilities**

(i.e., the Core interventions for Diarysia Plandstream Infection (BSI) Prevention)

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Train staff on infection control topics, including access care and aseptic technique. Perform competency evaluation for skills such as catheter care and accessing every 6-12 months and upon hire.

# 5. Patient education/engagement

Provide standardized education to all patients on infection prevention topics including vascular access care, hand hygiene, risks related to catheter use, recognizing signs of infection, and instructions for access management when away from the dialysis unit.

# 6. Catheter reduction

Incorporate efforts (e.g., through patient education, vascular access coordinator) to reduce catheters by identifying and addressing barriers to permanent vascular access placement and catheter removal.

# 7. Chlorhexidine for skin antisepsis

Use an alcohol-based chlorhexidine (>0.5%) solution as the first line skin antiseptic agent for central line insertion and during dressing changes.\*

# 8. Catheter hub disinfection

Scrub catheter hubs with an appropriate antiseptic after cap is removed and before accessing. Perform every time catheter is accessed or disconnected.\*\*

# 9. Antimicrobial ointment

Apply antibiotic ointment or povidone-iodine ointment to catheter exit sites during dressing change.\*\*\*





https://www.cdc.gov/dialysis/prevention-tools/core-interventions.html



SUPERIOR HEALTH
Quality Alliance

# TOGETHER LET'S KEEP DIALYSIS PATIENTS SAFE



Our last bloodstream infection was on



To learn more about dialysis safety, visit www.cdc.gov/dialysis







# We're on the Right Track to Leave Healthcare-Associated Infections Behind



Healthcare-associated infections are infections patients get while receiving treatment for a medical condition. Infections are a leading cause of death among hemodialysis patients. Dialysis-related infections can happen in many body locations including the blood stream, bones, lungs, and skin. To protect yourself and others:

- · Wash your hands before and after your dialysis session
- Make sure your access site is cleaned with soap and water before each dialysis treatment
- Make sure your dialysis staff washes their hands before and after they touch you or your dialysis machine, wears gloves, and does not store gloves in their pockets

Preventing healthcare-associated infections require everyone's involvement.

Let's all work together to cross the finish line with Zero infections!

To learn more about how to prevent infections at your clinic speak to



https://esrdncc.org/contentassets/ec603ad3fd9946 eb90fd96686fe3936e/ncc\_hai-trackingposter\_final\_508.pdf

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# Meaningful Audits! ...aka going beyond checking the box

- Vary auditor
- Vary days, shifts
- Audit all aspects of patient care and nursing activities in the dialysis environment
- Utilize a patient
- Do something with the findings team huddles, staff education



# **Checklist:** Hemodialysis catheter disconnection

Wear mask (if required)

					me: ⁄er:					AIVI	/ PIVI	(
Day: M W F Tu Th Sa Shift: 1st 2nd 3rd 4th Observer: Location within unit:  Audit Tool: Catheter connection and disconnection observations  (Use a "√" if action performed correctly, a "Φ" if not performed. If not observed, leave blank)										Perform hand hygiene		
Procedure observed, C=connect D=disconnect	Discipline	Mask worn properly (if required)	Hand hygiene performed	New clean gloves worn	Catheter removed from blood line aseptically (disconnection only)	Catheter hub scrubbed	antiseptic	Catheter connected to blood lines aseptically (connection only)	New caps attached aseptically (after disconnecting)	Gloves removed	Hand hygiene performed	Put on new, clean gloves Clamp the catheter
					S,,			· · · · · · · · · · · · · · · · · · ·				Disconnect catheter from blood lines aseptically
								Scrub catheter hub with antiseptic				
												Allow hub antiseptic to dry
Discipline: <b>P</b> =												Attach new caps aseptically
Duration of observation period =minutes									Remove gloves			
												Perform hand hygiene

CDC Audit tools – linked on resource page





CDC Dialysis Collaborative	Facility Name:	Date:	Start time:	AM / PM
Day: M W F Tu Th Sa Shift: 1st 2nd 3	<sup>rd</sup> 4 <sup>th</sup> Observer:	Location within	unit:	

# **Audit Tool:** Hemodialysis hand hygiene observations

(Use a " $\sqrt{}$ " for each 'hand hygiene opportunity' observed. Under 'opportunity successful', use a " $\sqrt{}$ " if successful, and leave blank if not successful

# Discipline Hand hygier

# **Guide to Hand Hygiene Opportunities in Hemodialysis**

	Hand hygiene opportunity category	Specific examples							
21	1. Prior to touching a patient	Prior to entering station to provide care to patient Prior to contact with vascular access site Prior to adjusting or removing cannulation needles							
-	2. Prior to aseptic procedures	Prior to cannulation or accessing catheter Prior to performing catheter site care Prior to parenteral medication preparation Prior to administering IV medications or infusions							
-	3. After body fluid exposure risk	After exposure to any blood or body fluids After contact with other contaminated fluids (e.g., spent dialysate) After handling used dialyzers, blood tubing, or prime buckets After performing wound care or dressing changes							
	4. After touching a patient	When leaving station after performing patient care     After removing gloves							
	5. After touching patient surroundings	After touching dialysis machine     After touching other items within dialysis station     After using chairside computers for charting     When leaving station     After removing gloves							

CDC
Audit
tools –
linked on
resource

Please make note of the following during this session.									
	Yes	No	Comments						
There is a sufficient supply of alcohol-based hand sanitizer									
There is a sufficient supply of soap at handwashing stations									
There is a sufficient supply of paper towels at handwashing stations									
There is visible and easy access to hand washing sinks or hand sanitizer									



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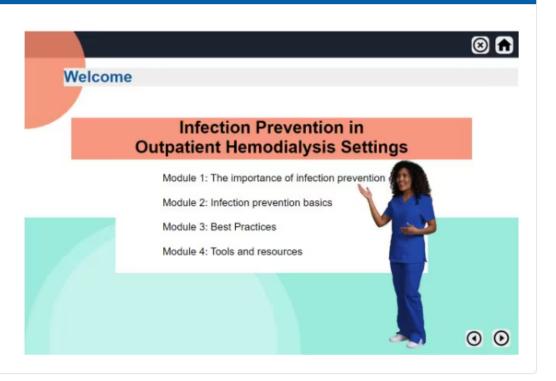




# **Training Course**

Infection Prevention in Outpatient Hemodialysis Settings
Click the button below to begin the training.

**Begin Training** 



- CDC Infection Prevention in Hemodialysis
- Basic
- Free 1.75 continuing education
- https://www.cdc.gov/dialysis/clinician/IPinDS-Training.html
   Midwest Kidney Network



# American Society of Nephrology

- 4 Part Series of Learning Modules created in conjunction with Project Firstline
- Hand hygiene
- PPE
- Injection Safety
- Environmental Cleaning
- Each 0.75 Continuing education
- https://epc.asnonline.org/projects/projectfirstline/

- NTDS (Nephrologists Transforming Dialysis Safety): Curriculum to Achieve Zero Preventable Infections
- 27 modules reading rather than video
- Comprehensive
- Best practice assign a reading to complete to team, discuss at a team huddle
- https://epc.asnonline.org/learning course/ntds-acurriculum-to-achieve-zeropreventable-infections/



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# The POWER of the EMPOWERED Patient

It only takes a minute to check your catheter.

**Check your catheter every day.** 

Look



Feel



Did you notice anything different when you checked your catheter today?

No change.

change.

Great!
Keep checking
each day.
At your next
treatment, tell your
Dialysis Care Team
that there was
no change.

Yes, a change.

Call the
contact given
to you by your
Dialysis Care Team.
Share what you found.
They will tell you
what to do next.

A Bridge to Your Lifeline



Look at your

It is clean and dry, and it covers the exit site (the place where the catheter comes out of your skin)



The dressing does not cover the exit site, it is wet or dirty, there is blood or pus on the dressing.



A Bridge to Your Lifeline



Feel

Feel over the dressing!

The cat

It is dry and there is no pain in the area under the dressing.



The catheter dressing is wet, you have pain in the area under the dressing, something feels different, or you think you have a fever.



Good to go!





Contact your dialysis care team if you notice any "stop" signs!

# **Patients with** Catheters



Infections

**U.S. Department of** Control and Prevention

www.cdc.gov/ckd www.cdc.gov/dialysis/patient

Dialysis Safer

TIP

Catheters have a higher risk of infection. Ask your doctor about getting a fistula or graft instead.

Learn how to take care of the

catheter at home. Do not get it wet.

Wash your hands often, especially before and after dialysis treatment.



Know the steps your healthcare providers should

take whe for treati

Know the signs and symptoms of infection and Know what to do if you have any problem with the catheter.

**Patients with** 





www.cdc.gov/ckd www.cdc.gov/dialysis/patient

Coalition <a href="https://www.">https://www.</a> cdc.gov/dialysis/coaliti on/resource.html



Take care of your dialysis access site at home. Avoid scratching or picking it.

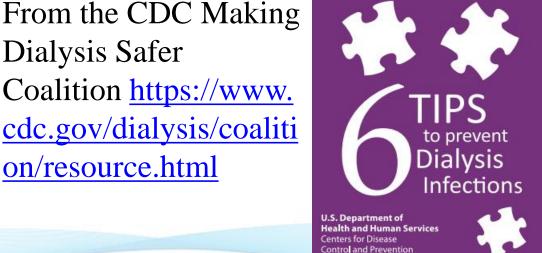
Wash your hands often, especially before and after dialysis treatment.

Wash or cleanse your dialysis access site prior to treatment.

Know the steps your healthcare providers should take when using your dialysis access for treatment.

Know the signs and symptoms of infection and what to do if you think you might have an infection.

any problem with your dialysis



Know what to do if you have access site.

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# **Access Disinfection**

- The correct product, the correct technique, every single time
- Scrub the Hub Protocol
- Follow Manufacturer Directions and Facility Policy (evidence based)

### Notes/Discussion:

### **Antiseptic Use and Selection**

As described in the 2011 CDC/Healthcare Infection Control Practices Advisory Committee (HICPAC) Guidelines for the Prevention of Intravascular Catheter-Related Infections, prior to accessing the catheter hub it should be disinfected with an appropriate antiseptic (greater than 0.5% chlorhexidine with alcohol, 70% alcohol, or 10% povidone-iodine). There is not enough evidence to recommend one antiseptic over the others. Generally, antiseptics should be allowed to dry for maximal effect.

If using 70% alcohol, sterile antiseptic pads should be used (sterile pads are labeled sterile and packaging for nonsterile pads often does not state whether the pads are sterile or nonsterile). For practical reasons, pads or similar products might be preferred over other forms of antiseptics (e.g., swabsticks) for disinfecting the catheter as they are malleable and allow for vigorous cleaning of small spaces.

If using an antiseptic that leaves a residue (e.g., chlorhexidine), avoid allowing large amounts of antiseptic to enter the lumen of the catheter to avoid potential toxicities to the patient.

If using chlorhexidine, removing all blood residue is particularly important to maximize the effect of the antiseptic.

### Soaking Caps

The role of soaking caps in an antiseptic prior to removing them is not clear. It is not a CDC/HICPAC recommendation. This procedure is described in the 2000 National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI) Vascular Access Guidelines but was not included in the 2006 update.

### **Handling Catheter Hubs**

Catheter hubs should always be handled aseptically. Once disinfected, the catheter hubs should not be allowed to touch nonsterile surfaces. This might be best performed by holding them until the antiseptic dries. During this time, the staff member performing the procedure should also ensure that the catheter remains clamped.

When disinfecting catheter hubs, clean, nonsterile gloves can be used if aseptic technique is maintained.

### **Bloodline Disinfection**

When accessing the line, disinfecting the ends of the sterile blood lines is not required if care has been taken not to contaminate the ends of the blood lines (i.e., through careful aseptic technique). Blood lines can become contaminated during connections and disconnections, as well as during the priming process. Contact with contaminated prime waste in prime buckets that have not been properly cleaned and disinfected or through backflow from waste handling ports must be avoided. Disinfecting the bloodlines does not address this issue.

### Disconnection and Line Reversals

Catheter hubs should be disinfected again after disconnecting from bloodlines and before replacing a new cap at the end of a treatment. This should be done in a manner similar to that used when disinfecting the hub prior to accessing. Disinfecting the catheter hub and the end of the extracorporeal blood line should also be performed if, during a treatment, a patient must be disconnected and their blood is re-circulated. Anytime a patient's circuit is disconnected this should be done aseptically and the number of times a patient's catheter is disconnected from the blood lines should be minimized to the extent possible.

### Securing Caps with Tape

Caution should be used if taping caps on to hubs between treatments. Tape can leave residue on the hubs that might make disinfecting them more difficult.

### Use of Masks

Although data supporting the use of masks during catheter accessing/deaccessing to prevent vascular access infections is lacking, this practice is recommended for patients and staff in the 2000 KDOQI guidelines and is included in the Centers for Medicare and Medicaid Services (CMS) End Stage Renal Disease Program Conditions for Coverage Interpretive Guidance.

### Personal Protective Equipment (PPE)

Proper PPE should always be worn by staff to avoid exposure to potentially infectious blood and body fluids when connecting/disconnecting catheters.

### **Aseptic Technique**

This includes practices that prevent the contamination of clean/sterile items and surfaces. Once tasks requiring aseptic technique have been started, care must be taken to avoid contamination of gloves and other clean/sterile items that can occur when touching dirty surfaces (e.g., positioning patient, using computer keyboard).

### **Selected References:**

- National Kidney Foundation. KDOQI Clinical Practice Guidelines and Clinical Practice Recommendations for 2006 Updates: Hemodialysis Adequacy, Peritoneal Dialysis Adequacy and Vascular Access. Am J Kidney Dis 2006; 48 (suppl 1):S1-S322.
- National Kidney Foundation. KDOQI Clinical Practice Guidelines for Hemodialysis Adequacy, 2000. Am J Kidney Dis 2001; 37 (suppl 1):S7-S64.
- O'Grady NP, Alexander M, Burns LM, et al. Guideline for the prevention of intravascular catheter-related infections. Clin Infect Dis 2011: 52:e162-e193.

# **Instead You Should...**

- Follow Facility Protocol
- Blood Cultures
- Other Labs?
- Notify Nephrology
- Other Transitions in Care Processes
- And...

**ROOT CAUSE!** 



# **Investigating the Infection**

 Patient factors – colonized MRSA, recent infections, indwelling/implanted devices

- Recent procedures
- Staff
- Chair
- Machine
- Water sample





# **Quality Improvement Plan**

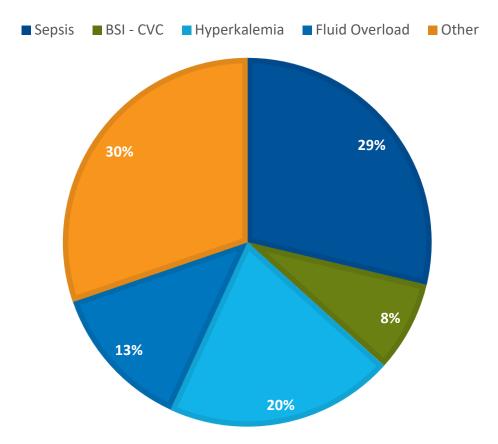
# **Quality Improvement 101**

FACILITY NAME:			PROVIDER NUMBER:								
DATE COMPLETED:				TEAM MEMBERS							
CONTACT NAME:		EMAIL:		INCLUDE IN	NTERNAL AND EXTERNAL PARTNERS						
PROBLEM STATEMENT:					2.						
GOAL:				3.							
ROOT CAUSE METHOD		Sį	pecific Strategy	Corresponding Root Cause		Barriers to implementation		Lead Team Member	Supporting Team Member(s)	Completion Date	
1.	WHAT ROOT CAUSES	1.								TARGET:	
2.		2.								TARGET:	
		2.								ACTUAL:	
		3.								TARGET:	
										ACTUAL:	
		4.								TARGET:	
										ACTUAL:	

# The ESRD Network

- Goals are both directly and indirectly impacted by vascular access infection
  - Hospitalization
  - Readmission
  - Emergency Department Usage
  - Transplant

# **HOSPITAL DIAGNOSES**





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- 2. Describe the risk of infection associated with each dialysis access type
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# **Resource List**

- CDC Vital Signs: Preventing Bloodstream Infections in Dialysis Patients <a href="https://www.cdc.gov/vitalsigns/dialysis-infections/">https://www.cdc.gov/vitalsigns/dialysis-infections/</a>
- CDC Core Interventions <a href="https://www.cdc.gov/dialysis/prevention-tools/core-interventions.html">https://www.cdc.gov/dialysis/prevention-tools/core-interventions.html</a>
- CDC Audits and Checklists <a href="https://www.cdc.gov/dialysis/prevention-tools/audit-tools.html">https://www.cdc.gov/dialysis/prevention-tools/audit-tools.html</a>
- ESRD NCC HAI Tracking
   Poster <a href="https://esrdncc.org/contentassets/ec603ad3fd9946eb90fd96686">https://esrdncc.org/contentassets/ec603ad3fd9946eb90fd96686</a> <a href="mailto:fe3936e/ncc\_hai-tracking-poster\_final\_508.pdf">fe3936e/ncc\_hai-tracking-poster\_final\_508.pdf</a>
- CDC Making Dialysis Safer
   Coalition <a href="https://www.cdc.gov/dialysis/coalition/resource.html">https://www.cdc.gov/dialysis/coalition/resource.html</a>
- ESRD NCC Catheter
   Check <a href="https://esrdncc.org/globalassets/patients/cathetercheckguide508">https://esrdncc.org/globalassets/patients/cathetercheckguide508</a>
   .pdf

# THANK YOU! And visit our website too! https://www.midwestkidneynetwork.org/

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