

Dialysis Infection Prevention in Non-Traditional Settings

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Objectives:

By the end of this session, participants will be able to:

- Identify infection prevention challenges unique to non-traditional dialysis settings.
- Describe best practices for infection control, including hand hygiene, environmental cleaning, and water safety protocols.
- Discuss emerging trends and innovations in infection prevention.
- Apply CDC and CMS guidelines to implement infection control protocols.
- Recognize the role of interdisciplinary teams in mitigating infection risks.

Outpatient Dialysis Infection Prevention Challenges

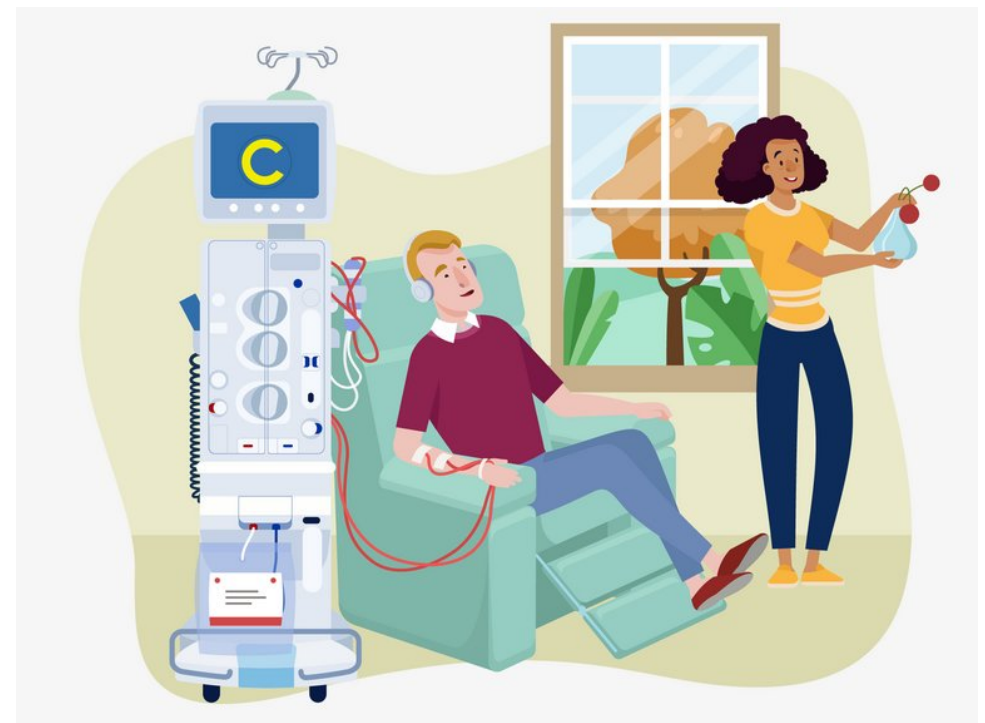
Types of outpatient dialysis

Home dialysis	In-center dialysis	Peritoneal Dialysis
<ul style="list-style-type: none"> • Patient self-administers dialysis • Involves specialized equipment and space for it in home • Requires trained dialysis partner to be present during treatment • Shown to produce positive outcomes with benefit of patient being in comfort of their home • Involves some risk if not done correctly or safely 	<ul style="list-style-type: none"> • Performed at a dedicated dialysis center by trained medical professionals • Patient visits designated center on a set schedule • Not private; Multiple patients can be receiving dialysis in the same space at the same time 	<ul style="list-style-type: none"> • Form of dialysis that uses the abdomen lining, the peritoneum, to filter the blood • A catheter is surgically placed in the peritoneum, allowing necessary access for dialysis • Repeated several times daily • Some patients are on automated peritoneal dialysis, in which a machine performs it during sleep

<https://pamhealth.com/resources/enhancing-recovery-chronic-kidney-disease-and-bedside-dialysis-hospital-care/>

Infection Prevention Challenges in Non-Traditional Dialysis Settings

- **Home Dialysis**
 - Limited oversight and adherence to protocols
 - Patient education & compliance concerns
- **Skilled Nursing Facilities (SNFs)**
 - Shared equipment & staffing limitations
 - Higher risk patient population
- **Urgent Care Centers**
 - Limited resources for infection control
 - Emergency situations may bypass standard precautions



<https://www.nephrocare.com/patients-home/treatment-options/haemodialysis-at-home>

Examples of Infection Prevention Challenges in Non-Traditional Dialysis Settings:

- Emergency or pop-up dialysis locations (e.g., during disasters)
 - Lack of clean water supply
 - Unreliable electricity
 - Inadequate waste disposal
 - Improvised treatment areas

- Correctional facilities
 - Crowded conditions
 - Limited sterile environments
 - Supply and equipment challenges
 - High staff turnover
 - Lack of on-site dialysis capability



<https://www.istockphoto.com/illustrations/home-dialysis>

Possible Challenges in These Settings:



Question query:

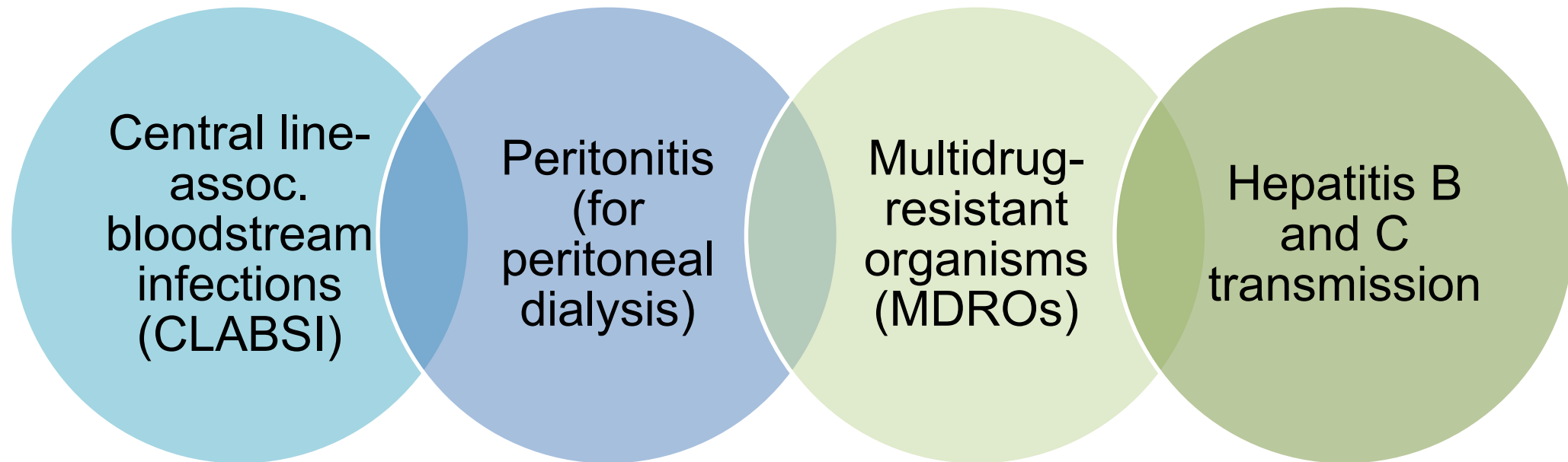
What is one infection prevention challenge in the long-term care (LTC) setting?

Possible responses:

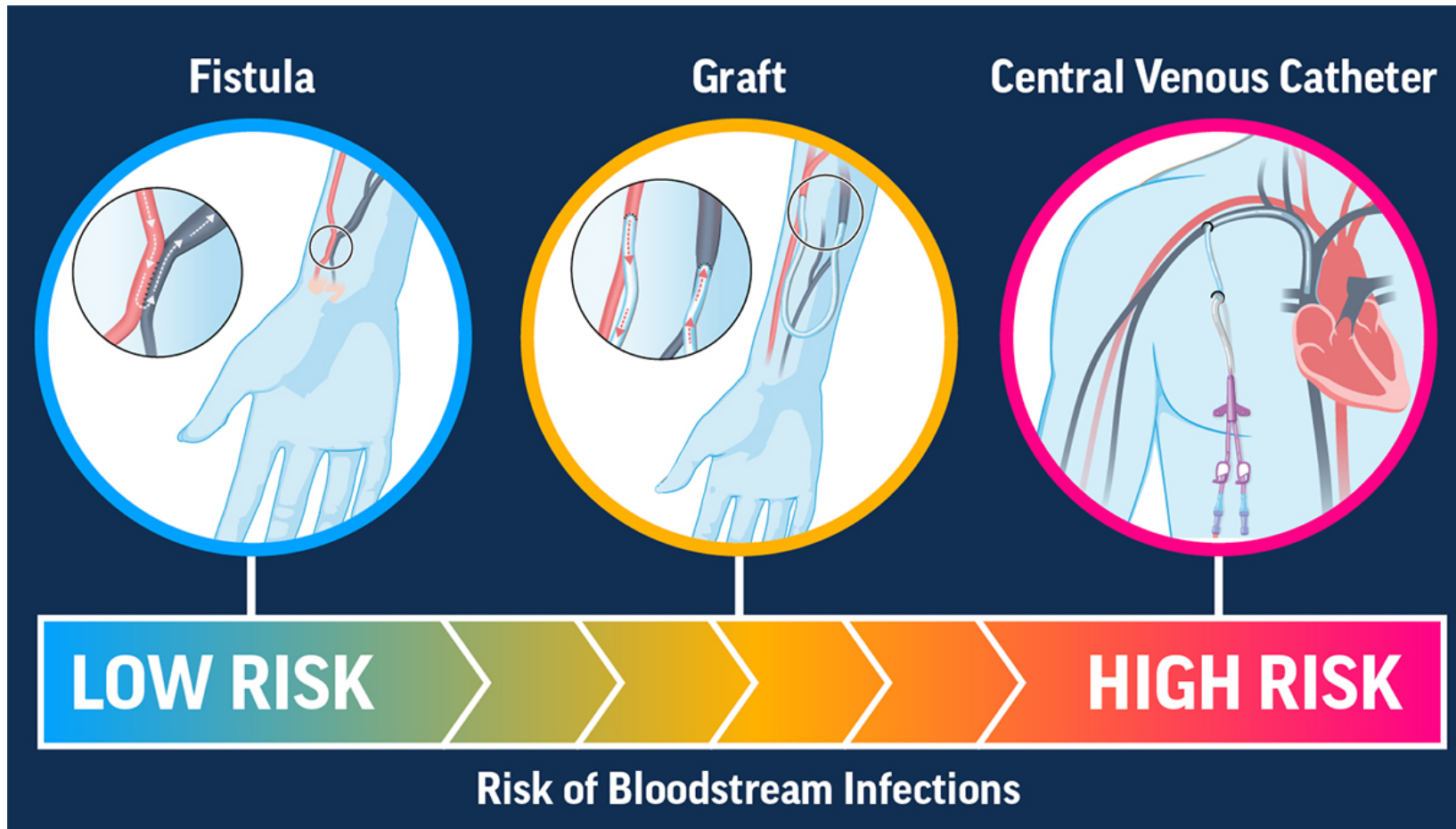
Common infection prevention challenges in the long-term care (LTC) settings

- Shared equipment
- Staffing limitations
- Higher risk patient population

Infection Risks in Dialysis Patients



Infection Risk in Dialysis Patients



<https://www.cdc.gov/dialysis-safety/about/index.html>

Question query:

What is one common infection risk in dialysis patients?

Possible responses:

Infection risks in dialysis patients

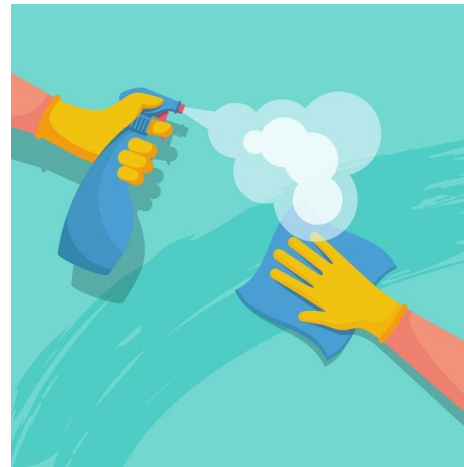
- Central line-associated bloodstream infections (CLABSI)
- Peritonitis (for peritoneal dialysis)
- Multidrug-resistant organisms (MDROs)
- Hepatitis B and C

Dialysis Infection Control Best Practices

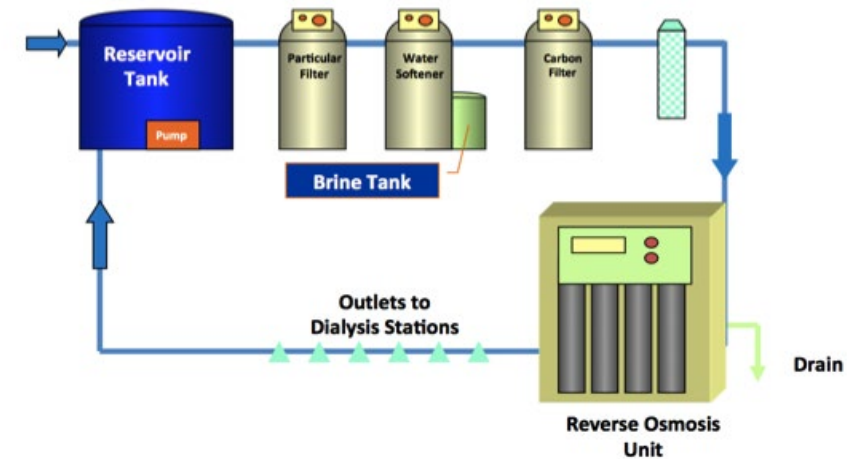
Best Practices for Infection Control



<https://www.vecteezy.com/free-vector/hand-wash>



https://www.shutterstock.com/search/disinfectant-surface?image_type=illustration



<https://www.intechopen.com/chapters/47722>

Hand Hygiene:

- Alcohol-based hand sanitizer is preferred unless hands are visibly soiled, then use soap and water
- Adherence to CDC guidelines



WHY IT MATTERS???

Dialysis patients are at high risk for bloodstream infections (BSIs), especially when receiving care in environments like homes, assisted living, or skilled nursing facilities. Inconsistent hand hygiene is a major contributor to infection risk.

Examples of When to Perform Hand Hygiene

Before

- Entering the patient's care area
- Touching the dialysis catheter or access site
- Donning gloves
- Preparing equipment or medications

During

- After touching potentially contaminated surfaces
- Between tasks if gloves become soiled or torn

After

- Contact with blood, body fluids or used supplies
- Removing gloves
- Leaving the patient care area

<https://www.cdc.gov/clean-hands/hcp/clinical-safety/index.html>

Hand Hygiene Methods

- **Alcohol-Based Hand Rub (ABHR):**
 - Preferred if hands are not visibly soiled
 - Use product with 60–95% alcohol
 - Rub all hand surfaces for **at least 20 seconds** until dry

- **Soap and Water:**
 - Required when hands are visibly dirty, after restroom use, or if exposed to *Clostridioides difficile*
 - Wash for **at least 20 seconds**, covering all surfaces
 - Dry with a clean towel or air dryer



Special Considerations for Non-Traditional Settings:

Home Dialysis:

- Ensure a dedicated hand hygiene station is available
- Educate caregivers and patients on proper hand hygiene technique
- Use portable ABHR if water is not readily accessible

Assisted Living & SNFs:

- Post visual reminders near sinks and ABHR dispensers
- Place hand sanitizer at the point of care and inside dialysis areas
- Encourage a “clean hands before care” policy for all staff

Supply Kits:

- Include ABHR, soap, and disposable towels in dialysis kits
- Replace as needed and monitor for expiration dates



Recommended Situations for Environmental Cleaning with Dialysis

Area / Item	Cleaning Protocol
Dialysis Station (bed/table/etc.)	Clean and disinfect before and after each treatment using EPA-registered disinfectant.
Reusable Equipment	Wipe down with appropriate disinfectant between uses (e.g., BP cuffs, scales).
Surfaces (floors, counters)	Clean daily or more frequently if visibly soiled or near dialysis area.
Supply Storage Area	Keep clean and dry.
Waste Disposal Area	Ensure lined containers; clean exterior surfaces daily and when contaminated.
Bathroom (if shared by patient)	Clean high-touch surfaces after each dialysis session.
Touchpoints (e.g., doorknobs)	Disinfect multiple times daily during active treatment periods.



<https://www.hfmmagazine.com/articles/3611-healing-environments-construction-and-engineering-roles-in-infection-prevention>

**Water Safety Protocols for Dialysis
in Non-Traditional Settings**



<https://mcpur.com/medical-water/market-applications/clinic-home-dialysis/>

Category	Protocol / Recommendation
Water Source	Use sterile dialysate (PD) or Reverse Osmosis (RO)-treated water (HD). Never use tap water directly.
Portable Systems	If using RO systems, ensure proper setup, pre-filtration, and sanitation.
Water Testing	Regular testing for chlorine, chloramine, heavy metals, and microbes (per AAMI standards).
Disinfection	Disinfect RO systems before/after use; prevent biofilm formation in holding tanks/tubing.
Cross-Contamination	Separate clean water and waste areas; install backflow prevention.
Staff Training	Train all personnel on operation, troubleshooting, and contamination recognition.
Documentation	Maintain logs of test results, filter changes, and disinfection procedures.
Emergency Prep	Have backup sterile supplies and alternate care site or transfer plan.

Catheter care:

Perform Hand hygiene

- HH before and after any catheter care or access
- Use ABHS or soap & water if hands are visibly soiled

- Use Aseptic Technique
 - Use sterile gloves and supplies during dressing changes and catheter access
 - Minimize handling of catheter and connections

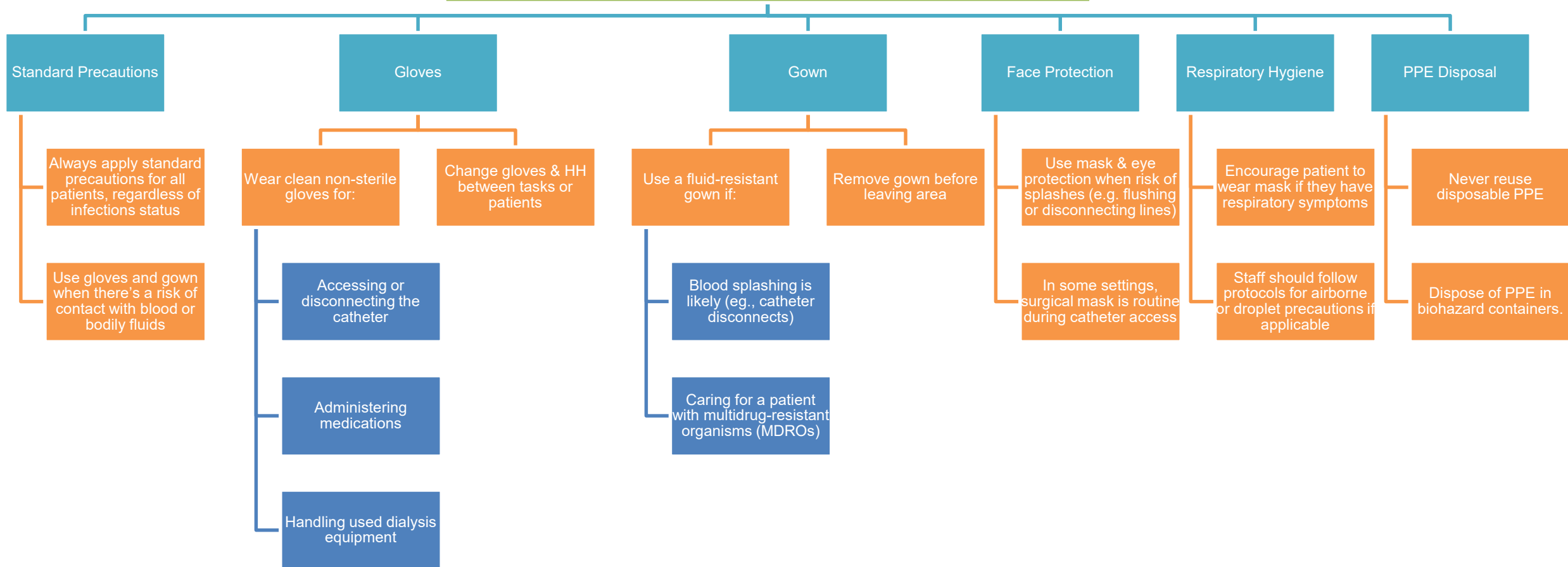
- Catheter Site Care
 - Clean site with chlorhexidine; allow to air dry completely
 - Apply sterile, transparent dressing and change per protocol (usually q 7 days or if soiled/loose)

- Hub Disinfection

Catheter care (cont.)

- Securement
 - Ensure catheter is secure to prevent pulling or dislodgement
- Monitoring
 - Inspect site for signs of infection (redness, swelling, drainage)
 - Document findings and report concerns promptly to their provider
- Antimicrobial Lock Solution (if used)
 - Use per provider order to help prevent bloodstream infections.
- Education
 - Train Staff and patients on proper catheter care, signs of infection and when to seek help.

Appropriate Use of Standard Precautions and PPE





<https://images.app.goo.gl/Hb4ALhAoXKYanPXR8>

Safe Injection Practices

- Use single-dose vials when possible
- Never reuse needles or syringes
- Clean vial tops with alcohol before use and allow to dry for 1 minute

Emerging Trends & Innovations in Infection Prevention

Portable & Sterile Dialysis Technology

- **Self-contained dialysis machines** (e.g., Tablo[®], NxStage[®]) designed for use in homes or remote areas with:
 - Integrated water purification
 - Touch-free interfaces to reduce contamination
 - Automated disinfection cycles
- **Pre-packaged sterile dialysate** for peritoneal dialysis reduces risk of fluid contamination

Antimicrobial and Antifouling Catheters

Catheters coated with antimicrobial agents (e.g., silver, chlorhexidine) to reduce catheter-related bloodstream infections (CRBSIs)

- **Biofilm-resistant materials** helping prevent long-term microbial colonization

Case review: *C. auris* Infection Prevention in Dialysis Settings

- *Candida auris*, a multi-drug resistant pathogen, can spread easily through health care facilities
- Dialysis facilities care for patients requiring complex medical care and invasive procedures, which puts them at greater risk for infection
- Dialysis can be safely provided regardless of a patient's *C. auris* status through adherence to standard dialysis IPC practices ([July 10, 2025 Morbidity and Mortality Weekly Report | CDC](#))
- The review of containment responses showed that the adherence to these IPC practices prevented transmission among patients in a dialysis setting of five facilities across four states over a four month period

[Candida auris Containment Responses in Health Care Facilities that Provide Hemodialysis Services — New Jersey, North Carolina, South Carolina, and Tennessee, 2020–2023 | MMWR](#): www.cdc.gov/mmwr/volumes/74/wr/mm7425a1.htm?s_cid=mm7425a1_w



Facilities caring for hemodialysis patients colonized with *C. auris*:

- Inform and educate staff
- Use appropriate PPE*
- Minimize exposure to other patients
- Clean and disinfect reusable equipment
- Inform receiving facility of patient's *C. auris* status

MMWR

*PPE = Personal Protective Equipment

bit.ly/4kwp4er

JULY 10, 2025



[Candida auris Containment Responses in Health Care Facilities that Provide Hemodialysis Services — New Jersey, North Carolina, South Carolina, and Tennessee, 2020–2023 | MMWR: www.cdc.gov/mmwr/volumes/74/wr/mm7425a1.htm?s_cid=mm7425a1_w](https://www.cdc.gov/mmwr/volumes/74/wr/mm7425a1.htm?s_cid=mm7425a1_w)

Additional Emerging Trends

Telehealth & Remote Monitoring

- **Remote infection surveillance** via telehealth for early detection of exit site infections, PD peritonitis, or catheter problems
- **Wearable sensors** for real-time tracking of vitals and early sepsis indicators

Microlearning & Just-in-Time Training

Infection control training through:

- **Short mobile videos**
- **App-based simulations** for PD catheter care, PPE donning/doffing
- **AI-powered chatbots** answering infection control questions on-demand for staff

CDC & CMS Guidelines for Infection Control

- **CDC Guidelines:**
 - Dialysis infection prevention tools and resources
 - Surveillance and reporting of infections
 - <https://www.cdc.gov/dialysis-safety/hcp/recommendations-resources/index.html>
- **CMS Conditions for Coverage:**
 - Regulatory requirements for infection control in dialysis facilities
 - Compliance with federal safety standards
 - <https://www.cms.gov/medicare/health-safety-standards/conditions-coverage-participation/end-stage-renal-disease-facilities>

The Role of Interdisciplinary Teams

Collaboration for Infection Prevention:

- Nephrologists, nurses, and infection preventionists
- Facility administrators and home dialysis trainers



Training & Education:

- Continuous staff and patient education
- Implementation of infection prevention protocols

Training and Education Strategies:

- Tailored education for caregivers and staff
- Competency checks (e.g., aseptic technique demos)
- Easy-to-understand signage and job aids
- Use CDC Project Firstline training materials

<https://www.cdc.gov/project-firstline/hcp/training/index.html>



<https://images.app.goo.gl/spGvph9Sa1fkNV3r9>

Question query:

What is one emerging trend in infection prevention related to dialysis care?

Possible answers:

Common emerging trends in infection prevention related to dialysis care

- Portable and sterile dialysis technology
- Antimicrobial and antifouling catheters
- Telehealth and remote monitoring
- Microlearning and just-in-time training

Public Health's Role

- Surveillance and outbreak response
- Staff education through Project Firstline Partnership
- Community education and support
- Liaison between facilities and dialysis providers
- Policy development and resource distribution



**PROJECT
FIRSTLINE**
CDC'S National Training Collaborative
for Healthcare Infection Prevention & Control

Case Studies

CASE STUDY 1

Scenario: Infection Outbreak in Assisted Living Facility

- **Background:**

An assisted living facility in rural Louisiana provides home hemodialysis support for four residents using contracted dialysis nurses. Each resident has a central venous catheter (CVC) for dialysis. The staff assists with preparation, room setup, and coordination but are not dialysis-certified.
- **Incident:**

Over the course of two weeks, three of the four residents developed bloodstream infections (BSIs). One resident required hospitalization for sepsis. A public health investigation was launched after the facility notified the Office of Public Health.

Scenario: Infection Outbreak in Assisted Living Facility (cont.)

Findings:

- **Improper hand hygiene:** Facility aides were observed touching catheter sites without performing hand hygiene before or after glove use.
- **Inadequate environmental cleaning:** Dialysis procedures were performed in resident rooms with poor surface disinfection and visible clutter.
- **Staff training gaps:** Non-clinical staff were unaware of aseptic protocols related to catheter care and dialysis prep.
- **Communication breakdown:** No standardized method for sharing dialysis-related concerns between the facility, the dialysis provider, and public health.

Scenario: Infection Outbreak in Assisted Living Facility (cont.)

Public Health Interventions:

- Immediate infection control training provided on-site using CDC and Project Firstline materials.
- Facility developed a checklist for dialysis prep and post-care cleaning.
- Coordination protocols established with the dialysis provider.
- Follow-up audits scheduled monthly by a regional public health nurse.

Outcome: No new infections were reported in the following three months. Staff confidence and adherence to IPC measures significantly improved.

CASE STUDY 2

Scenario: Infection Outbreak in Long Term Care Facility

- **Background:** Mrs. Jones is a 68-year-old patient with end-stage renal disease (ESRD) who resides in a long-term care facility. Due to her frailty and transportation challenges, she receives peritoneal dialysis (PD) in her room at the facility. A mobile dialysis nurse from an external agency performs PD exchanges daily.
- **Incident:** Recently, several residents in the facility began experiencing gastrointestinal symptoms, and a facility-wide infection control audit was conducted.

Scenario: Infection Outbreak in LTC Facility (cont.)

Findings:

- During a routine infection control assessment, the following observations were made during one of Mrs. Jones' dialysis sessions:
- The dialysis nurse did not perform hand hygiene before donning gloves.
- Supplies, including the PD fluid bags, were stored in the patient's bedside drawer alongside unrelated items like lotion and snacks.
- The nurse placed used dialysis supplies in an open trash bin in the room before exiting.
- No disinfecting of high-touch surfaces (like the overbed table and IV pole) was performed before or after the procedure.
- Personal protective equipment (PPE) was used inconsistently, and the nurse removed gloves and exited the room without hand hygiene.
- The long-term care staff were unclear on their roles in supporting infection control during the dialysis process.
- A week later, Mrs. Jones was hospitalized for peritonitis.

CASE STUDY 2

Discussion Questions:

- What infection prevention breaches do you identify in this case?
- What are the unique infection control challenges of providing dialysis in a non-traditional setting like a long-term care facility?
- How could this facility and the dialysis provider improve training and protocols to prevent similar outcomes?
- What role can public health or infection control teams play in supporting safer dialysis in such settings?
- How should communication and responsibilities be coordinated between facility staff and the external dialysis provider?

CASE STUDY 2

Key Learning Points:

- Infection prevention protocols must be adapted and rigorously followed even in non-clinical environments.
- Hand hygiene, PPE use, and environmental cleaning are critical in home or long-term care dialysis.
- Clear communication and shared responsibilities between providers and facility staff are essential.
- Supplies must be stored properly to avoid contamination.
- Surveillance and reporting systems should flag infection trends early to prevent outbreaks.

Question query:

What is one example of public health's role in supporting providers related to infection prevention in dialysis care?

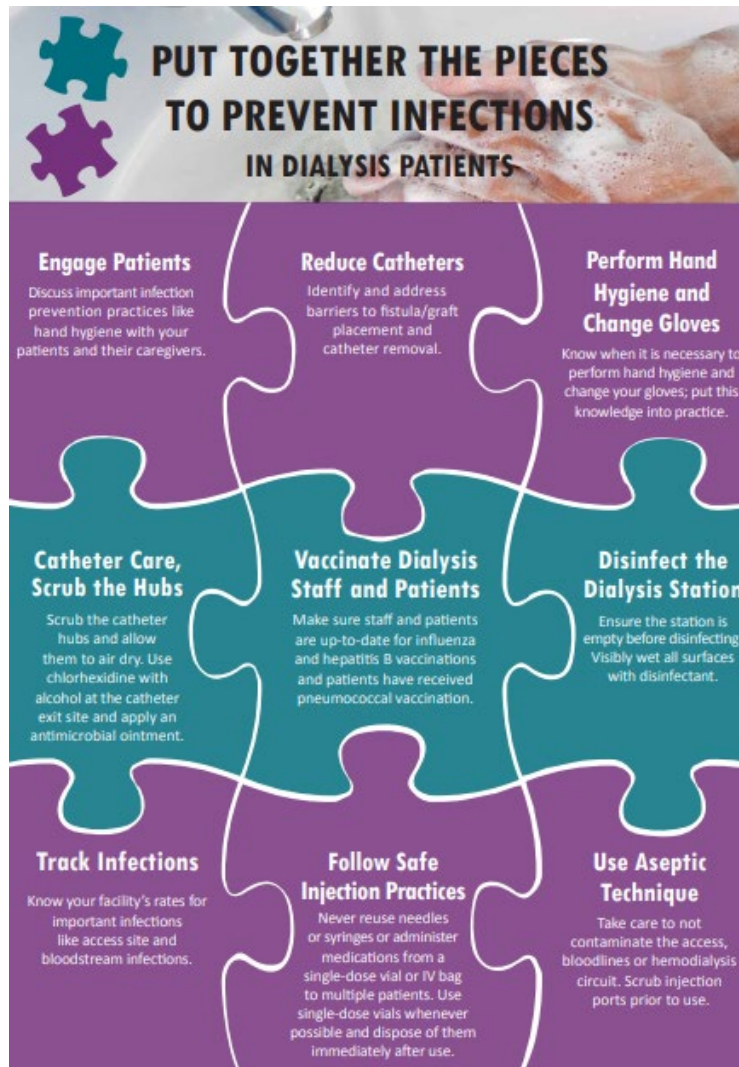
Possible answers:

Examples of public health's role in supporting providers related to infection prevention in dialysis care

- Surveillance and outbreak response
- Staff education through Project Firstline Partnership
- Community education and support
- Acting in liaison role between facilities and dialysis providers
- Policy development and resource distribution

TOOLS AND RESOURCES:

- CDC Dialysis Safety: https://www.cdc.gov/dialysis-safety/about/?CDC_AAref_Val=https://www.cdc.gov/dialysis/patient/conversation-starter.html
- CDC Core IPC Practices for all Healthcare Settings: <https://www.cdc.gov/infection-control/hcp/guidance/index.html>
- Project Firstline modules: <https://www.cdc.gov/project-firstline/programs/index.html>
- APIC Infection Prevention resources:
<https://apic.org/resources/overview/>
- State/local health department guidelines: <https://apic.org/resources/overview/>
- Infection Prevention in Dialysis Settings Series: <https://edhub.ama-assn.org/cdc-project-firstline/pages/infection-prevention-dialysis-settings-series>



www.cdc.gov/dialysis

www.cdc.gov/dialysis-safety/media/pdfs/Dialysis-provider-poster-P.pdf

- Each piece of the puzzle plays a role in keeping dialysis patients healthy and reducing the risk of infections. Together, let's assemble the pieces.
 - Engage patients
 - Reduce catheters
 - Perform hand hygiene/change gloves
 - Catheter care
 - Vaccinate
 - Disinfect the station
 - Track infections
 - Follow safe injection practices
 - Use aseptic technique

References

- [Centers for Disease Control and Prevention \(CDC\). \(2025, July 10\). Candida auris Containment Responses in Health Care Facilities that Provide Hemodialysis Services — New Jersey, North Carolina, South Carolina, and Tennessee, 2020–2023 | MMWR](#)
- Infections and Patients on Dialysis: <https://www.cdc.gov/dialysis-safety/about/>
- Conditions for Coverage for End Stage Renal Disease Facilities: <https://www.cms.gov/Regulations-and-Guidance/Legislation/CFCsAndCoPs/ESRD>
- Infection Prevention in the Dialysis Environment: https://epc.asn-online.org/resource_lib/infection-prevention-in-the-dialysis-environment/
- Dialysis Safety, Resources & Tools: <https://www.cdc.gov/dialysis-safety/hcp/tools>
- Infection Control Basics: <https://www.cdc.gov/infection-control/hcp/basics/standard-precautions.html>
- Injection Safety: <https://www.cdc.gov/injection-safety/about/index.html>
- Continued COVID-19 Management for Dialysis Facilities: <https://www.cms.gov/files/document/qso-20-36-esrd.pdf>
- Project Firstline: <https://www.cdc.gov/project-firstline/>

Evaluation QR Code



THANK YOU

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