به نام خدا

Infection Prevention in Dialysis Settings

infection

Why Infections in Dialysis Patients

- Patients who undergo dialysis treatment have an increased risk for getting a healthcare-associated infection (HAI). Hemodialysis patients are at a high risk for infection because the process of hemodialysis requires frequent use of catheters or insertion of needles to access the bloodstream.

infection

Reduced Immunity plays a Role in Infections

- Haemodialysis patients have weakened immune systems, which increase their risk for infection, and they require frequent hospitalizations and surgery where they might acquire an infection

infection

Renal failure Patients are susceptible to Infections

- Patients with renal failure are susceptible to infection. In the predialysis era, 60% of patients with chronic renal failure requiring hospitalization were infected and 39% died from infectious causes. It was assumed that the debility caused by the uremic state increased the risk of infection, and the reversal of uremia would reduce the risk of infection.

Types of infections in hemodialysis unit

- Infections due to the process of hemodialysis:

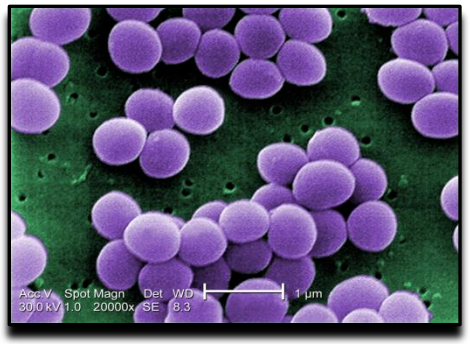
1) Catheter related Bacteremia (The risk of infection from CVC is estimated to be 10 times higher compared to arteriovenous fistula infection)
2) AVF / AVG infections
3) Dialysate water related infections.

- Infectious transmission between patients:

1) Hepatitis B and C, HIV
2) MRSA carrier state
3) Respiratory infections: TB, Influenza, Pneumococcal

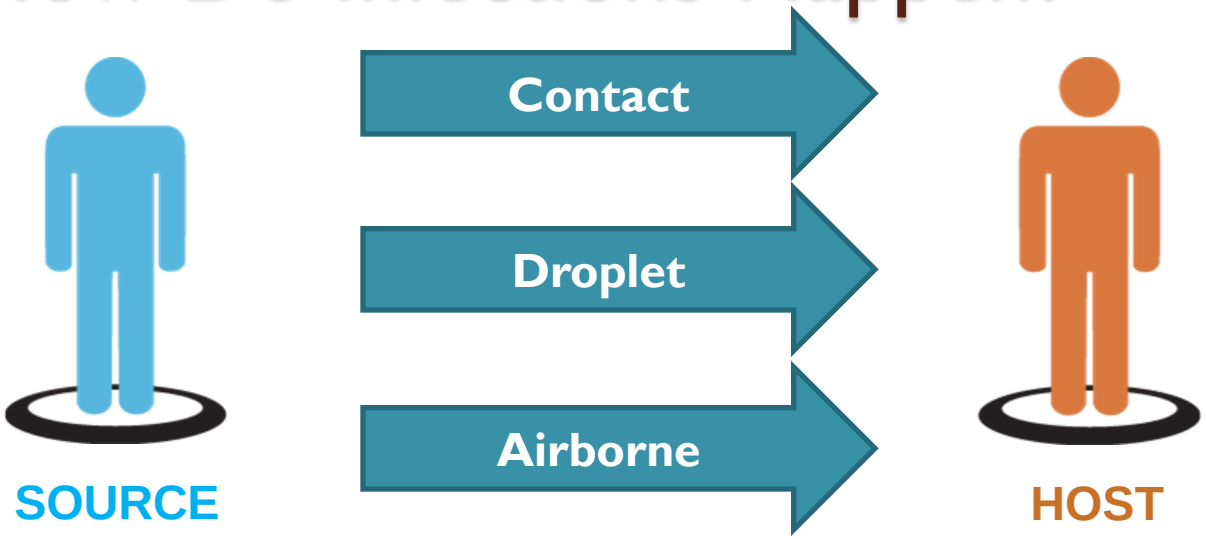
Infections in Dialysis Patients

- **Bloodstream infections** are a dangerous complication of dialysis
- 1 in 4 patients who get a bloodstream infection caused by *S. aureus* (staph) bacteria can face complications such as:
  - Endocarditis (infected heart valve)
  - Osteomyelitis (infected bone)



- Total costs for each infection can be more than $20,000
- Bloodstream infections can cause sepsis (a potentially deadly condition)
- Up to 1 in 5 patients with an infection die within 12 weeks

How Do Infections Happen?



Three elements must be present for an infection to occur:

1. A ***source*** of germs (like bacteria or viruses)
2. A susceptible ***host***, meaning a person who is at risk of getting an infection from the germs
3. A ***way*** for the germs to move from the source to the host
   - There are three ways in which germs move from the source to the host: ***Contact, Droplet, and Airborne Transmission***

Your Role in Contact Transmission

- During dialysis, infections can be spread by Contact Transmission
- Most commonly by **healthcare worker hands!**

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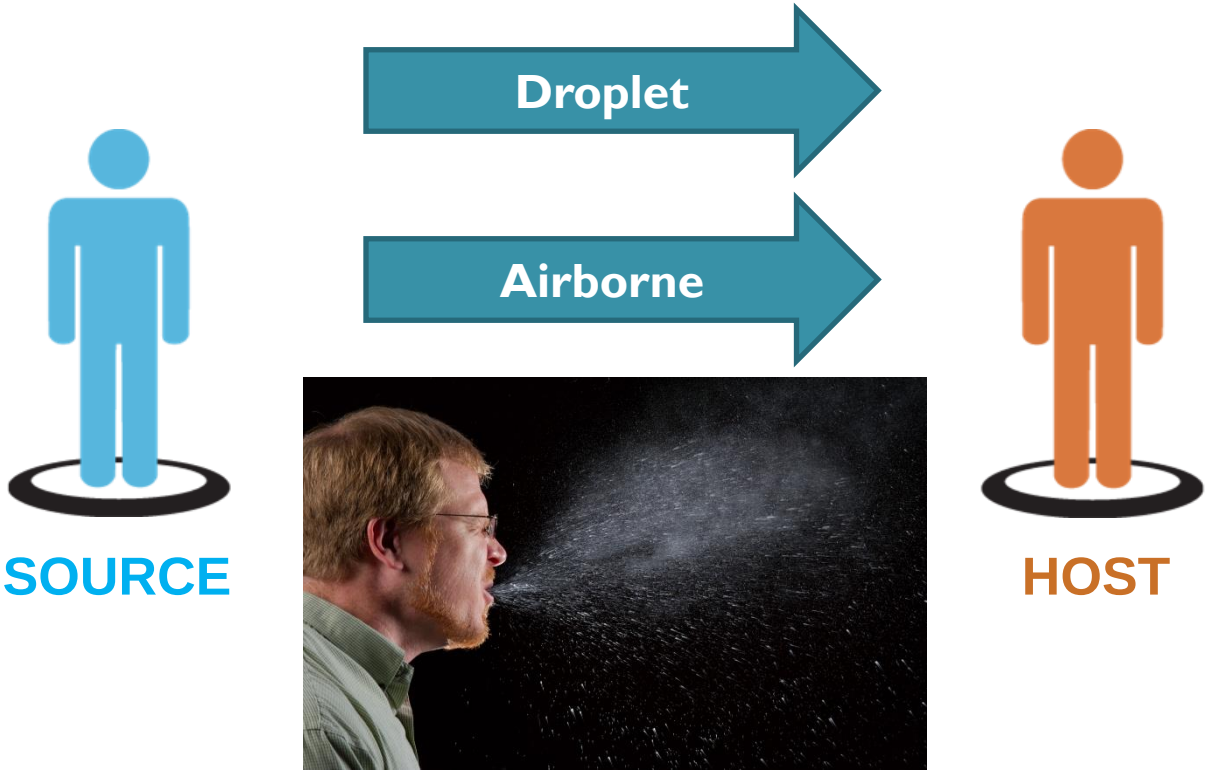
Spread of Respiratory Infections



- Certain infections are spread by certain routes:
  - Flu may be spread by Droplet Transmission
  - Tuberculosis is spread by Airborne Transmission

What Can You do to Prevent the Spread of Infections?

Understand and Follow the Basics of Infection Control

All healthcare workers are expected to follow ***Standard Precautions*** for infection control.

Standard Precautions

Standard Precautions for all Healthcare Workers in All Healthcare Settings

PPE photo provided by Rosetta Jackson, used with permission

Standard Precautions for all Healthcare Workers

- Perform hand hygiene
- Use personal protective equipment (PPE)
- Follow safe injection practices

What is Hand Hygiene?

- Staff should wash their hands with soap or an antiseptic hand-wash and water, before and after contact with a patient or any equipment at the dialysis station.
- An antiseptic alcohol gel rub may be used instead when their hands are not visibly contaminated.
- In addition to hand washing, staff should wear disposable gloves when caring for a patient or touching any potentially contaminated surfaces at the dialysis station.
- Gloves should always be removed when leaving the dialysis station.
- Where practical, patients should also clean their hands, or use an alcohol gel rub, when arriving at and leaving the dialysis station

Perform Hand Hygiene

How to perform hand hygiene

- When hands are visibly soiled with blood or other body fluids, wash hands with **soap and water**

- If hands are not visibly soiled, use an **alcohol-based hand rub**

*Remember**: hand hygiene** is one of the most important ways for you to prevent the spread of infections*

CDC
hand hygiene saves lives

Perform Hand Hygiene

When *you should perform hand hygiene*

- Before you touch a patient
- Before you inject or infuse a medication
- Before you cannulate a fistula/graft or access a catheter
- After you touch a patient
- After you touch blood, body fluids, mucous membranes, wound dressings, or dialysis fluids (e.g., spent dialysate)
- After you touch medical equipment or other items at the dialysis station
- After you remove gloves

Remember: ***perform hand hygiene*** *between each patient or station*

CDC
hand hygiene saves lives

Use Personal Protective Equipment (PPE) Correctly

For your own protection and to protect patients

- Wear **gloves**, a **gown**, and/or **face protection** when you think you may come into contact with blood or other potentially infectious materials
- Change gloves during patient care if the hands will move from a contaminated body-site to a clean body-site
- Remove gloves after contact with a patient and/or the surrounding environment (including medical equipment)
- Do not wear the same pair of gloves for the care of more than one patient

How to Prevent Cross Contamination

- ✓ Caregivers must wear appropriate PPE:
- Gloves, gowns and masks with face shields when accessing AVF, AVG, catheter
- ✓ Gloves must be used for
- All patient contact
- All machine contact
- All medication preparation
- ✓ Gloves must be changed
- Between patients
- Between machines
- When moving from one area to another

Follow Safe Injection Practices

- Medications are injected directly or indirectly into the patient's bloodstream
- Any germs that have entered the medication vial or syringe can cause serious infections in the patient
- Germs also can be introduced at the time of injection (e.g. contaminated injection port)

Prevent Cross contamination

When multiple dose medication vials are used, prepare individual patient doses in a clean (centralized) area away from dialysis stations and deliver separately to each patient.

Do not carry multiple dose medication vials from station to station

Follow Safe Injection Practices

Three things you need to know:

1. Needles and syringes are single use devices. They should not be used for more than one patient.
2. Do not administer medications from a single-dose vial or IV bag to multiple patients.
3. Perform hand hygiene and cleanse the access port before injecting into it.

Saline bags are always single patient use

Recommendations

Specific Infection Control Recommendations for Outpatient Hemodialysis Healthcare Workers

Specific Infection Control Precautions for Hemodialysis Healthcare Workers

- Wear gloves and other personal protective equipment (PPE) for all patient care
- Promote vascular access safety
- Separate clean areas from contaminated areas
- Use medication vials safely
- Clean and disinfect the dialysis station between patients

Wear Gloves During Patient Care

For your own protection

- Wear disposable **gloves** when caring for the patient or touching equipment at the dialysis station

- Remember to remove gloves and **perform hand hygiene** between each patient or station, and if moving from a contaminated to clean area of the same patient or within the same dialysis station

Use Personal Protective Equipment (PPE)
For your own protection

- In addition to **gloves**, you should wear **gowns** and **face protection** to protect yourself as needed:
  - During initiation and termination of dialysis
  - When handling lab samples
- PPE should be changed if it becomes dirty

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Basic Steps in Fistula/Graft Care

Cannulation Procedure:

1. Wash the site
2. Perform hand hygiene
3. Put on a new, clean pair of gloves
4. Wear proper face protection
5. Apply skin antiseptic and allow it to dry
6. Insert needle using aseptic technique
7. Remove gloves and perform hand hygiene

Aseptic technique *means taking great care to not contaminate the fistula or graft site before or during the cannulation or decannulation procedure*

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Basic Steps in Fistula/Graft Care

Decannulation Procedure:

1. Perform hand hygiene
2. Put on a new, clean pair of gloves
3. Wear proper face protection
4. Remove needles using aseptic technique
5. Apply clean gauze/bandage to site
6. Compress the site with clean gloves
7. Remove gloves and perform hand hygiene

Basic Steps in Catheter Care

Catheter Connection Procedure:

1. Perform hand hygiene
2. Put on a new, clean pair of gloves
3. Wear proper face protection
4. Apply antiseptic to catheter hub and allow it to dry
5. Connect the catheter to blood lines using aseptic technique
6. Unclamp the catheter
7. Remove gloves and perform hand hygiene

Basic Steps in Catheter Care

Catheter Disconnection Procedure:

1. Perform hand hygiene
2. Put on a new, clean pair of gloves
3. Wear proper face protection
4. Disconnect the catheter from blood lines using aseptic technique
5. Apply antiseptic to catheter hub and allow it to dry
6. Replace caps using aseptic technique
7. Make sure the catheter remains clamped
8. Remove gloves and perform hand hygiene

Separate Clean Areas from Contaminated Areas

- **Clean areas** should be used for the ***preparation, handling and storage*** of medications and unused supplies and equipment

- **Contaminated areas** are where ***used supplies and equipment*** are handled
- Do not handle or store medications or clean supplies in the same area as where used equipment or blood samples are handled

Remember:Treatment stations are contaminated areas!

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Safe Use of Medication Vials

- Prepare all individual patient doses in a clean area away from dialysis stations
- Prepare doses as close as possible to the time of use
- Do not carry medications from station to station
- Do not prepare or store medications at patient stations
- CDC recommends that dialysis facilities:
  - Use single-dose vials whenever possible and dispose of them immediately after use

Guidelines for Carrying Medications

- Do not use the same medication cart to deliver medications to multiple patients
- Do not carry medication vials, syringes, alcohol swabs, or supplies in pockets
- Be sure to prepare the medication in a clean area away from the patient station and bring it to the patient station for that patient only at the time of use

Cleaning and Disinfecting the Dialysis Station

- **Cleaning** and **disinfection** reduce the risk of spreading an infection
- ***Cleaning*** is done using cleaning detergent, water and friction, and is intended to remove blood, body fluids, and other contaminants from objects and surfaces

- ***Disinfection*** is a process that kills many or all remaining infection-causing germs on clean objects and surfaces
- <u>Wear gloves</u> during the cleaning/disinfection process

Disinfecting the Dialysis Station

- All equipment and surfaces are considered to be contaminated after a dialysis session and therefore must be disinfected
- After the patient leaves the station, **disinfect** the dialysis station (including chairs, trays, countertops, and machines) after each patient treatment
  - Wipe all surfaces
  - Surfaces should be wet with disinfectant and allowed to air dry
  - Give special attention to cleaning control panels on the dialysis machines and other commonly touched surfaces

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Safe Handling of Dialyzers and Blood Tubing

- Before removing or transporting used dialyzers and blood tubing, cap dialyzer ports and clamp tubing

- Place all used dialyzers and tubing in leak-proof containers for transport from station to reprocessing or disposal area

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Policies and Practices

Infection Control Policies and Practices for Outpatient Hemodialysis Facilities

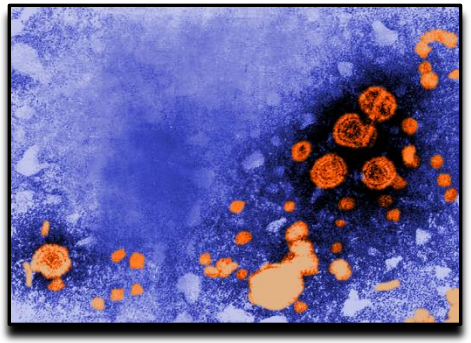
Infection Control Policies and Practices for Dialysis Facilities

- Vaccination of dialysis staff and patients
- Preventing the spread of hepatitis B
- Preventing the spread of bacterial infections

Vaccine-Preventable Infections

- Influenza
  - Influenza or the "flu" is a respiratory infection that infects the nose, throat, and lungs
  - The flu is spread mainly by droplets that are made when people with flu cough, sneeze or talk
  - The single best way to prevent the flu is to get a flu vaccine each year

- Hepatitis B
  - Hepatitis B is a serious infection that affects the liver. It can cause acute (short-term) or chronic (long-term) infection and liver cancer
  - Hepatitis B virus is easily spread through contact with the blood or other body fluids of an infected person
  - Hepatitis B vaccine can prevent hepatitis B infection



Take Care of Yourself
Get Vaccinated

- Get the flu vaccine each year
- Complete the hepatitis B vaccine series

Preventing the Spread of Hepatitis B

- Dialyze hepatitis B (HBsAg+) patients in a separate room using separate machines, equipment, instruments, and supplies
  - Be sure to use a separate gown when treating these patients
- Staff members caring for patients with hepatitis B (HBsAg+) should not care for HBV-susceptible patients at the same time (e.g., during the same shift or during patient changeover)

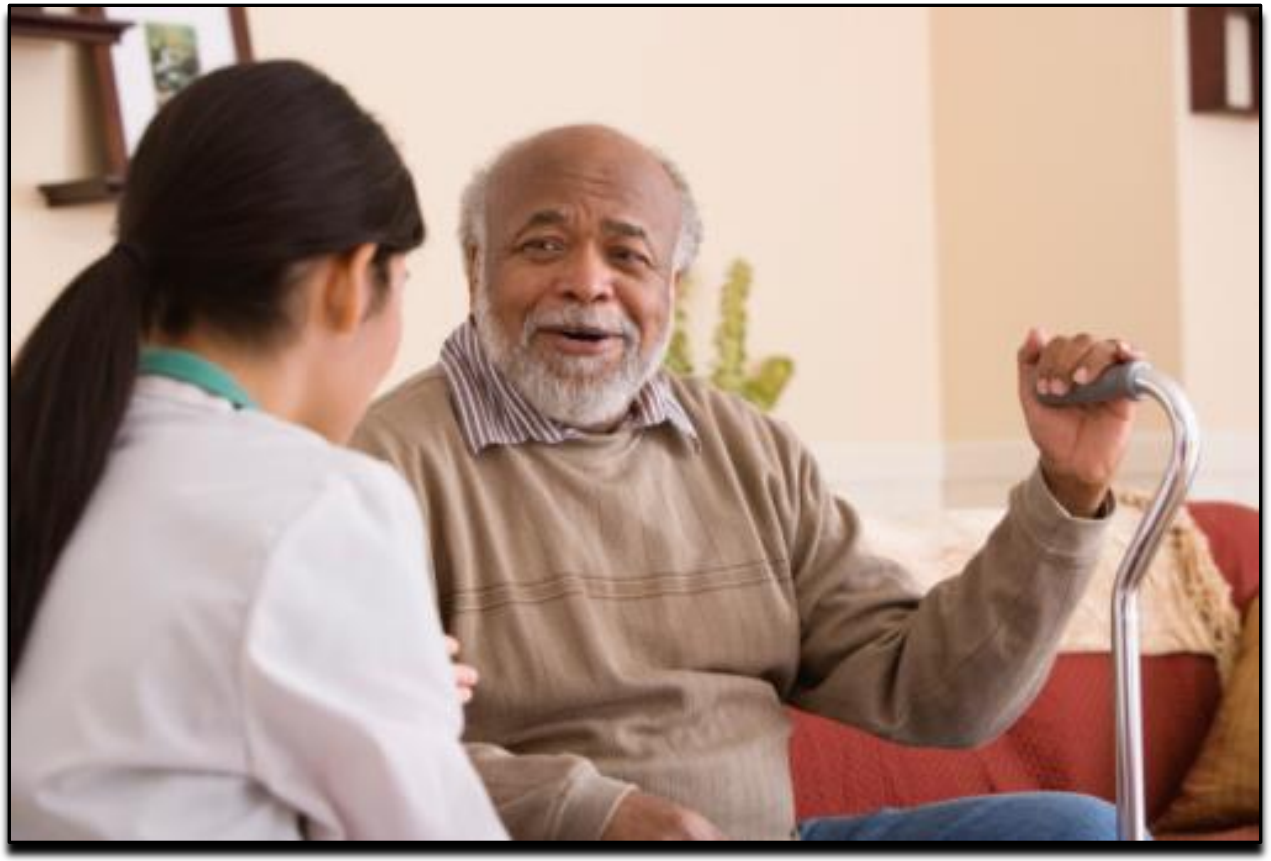
- *HBsAg+ means hepatitis B surface antigen (a lab test for hepatitis B virus) was positive*
- *HBV-susceptible means anyone who has never been infected and lacks immunity to hepatitis B virus*

Preventing the Spread of Bacterial Infections

- Hemodialysis patients who might be at increased risk for spreading germs to other patients include those with:
  - An infected skin wound with drainage that is not contained by dressings
  - Fecal incontinence or uncontrolled diarrhea
- For these patients use the following precautions:
  - Wear a gown and gloves when you are caring for the patient and remove the gown and gloves when you are finished caring for the patient
  - Do not wear the same gown when caring for other patients
  - Dialyze the patient at a station with as few adjacent stations as possible (e.g., at the end or corner of the room)
- Patients with respiratory illness and a fever are at risk of spreading bacterial and viral respiratory infections
  - These patients should be dialyzed at least 6 feet away from other patient stations or any shared supplies

Education

Educating your Patients and their Caregivers



How to Recognize an Infection

- Advise patients to inform you if they notice any of the following possible signs of infection:
  - Fever
  - The access site is:
    - Swollen (bulging),
    - red,
    - warm, or
    - has pus
  - Severe pain at the access site

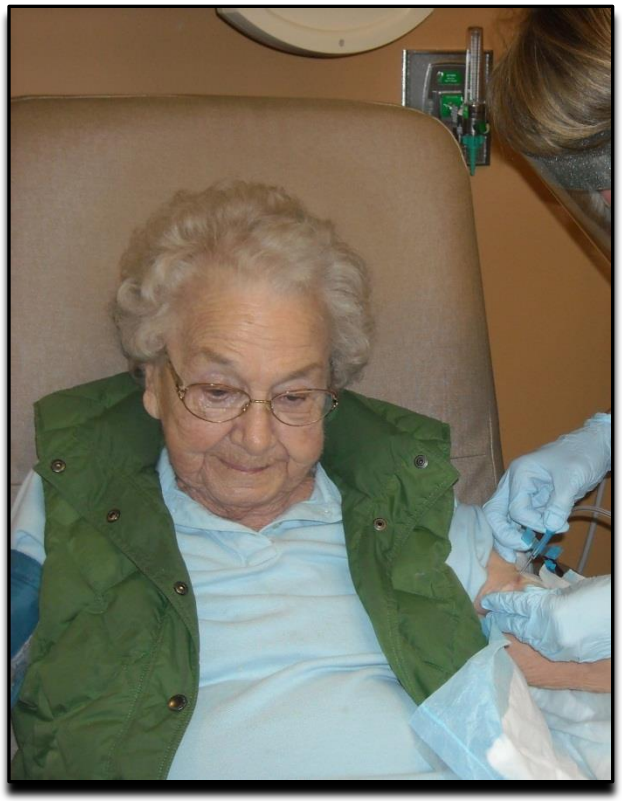
Remember: infections of the vascular access site can be life threatening

Training and Education of Patients and their Caregivers

- When a new patient starts dialysis and on an annual basis, review:
  - Personal hygiene and hand hygiene technique
  - Patient responsibility for proper care of the access site and recognition of signs of infection
  - Recommended vaccinations (including hepatitis B, influenza, and pneumococcal)
  - Reasons for selecting a fistula or graft over a catheter to lower the risk of infection

Recap

Preventing Infections in Hemodialysis Settings



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Key Infection Prevention Practices

- Perform hand hygiene frequently and change gloves
- Maintain separate clean areas for supplies and medications and separate contaminated areas for used items
- Perform effective cleaning and disinfection of dialysis equipment and environmental surfaces
- Carefully handle medications and the patient's vascular access to avoid contamination

Remember: Use aseptic technique every time!

Conclusion

- Infections that patients can get while receiving dialysis are serious and preventable!
- Healthcare workers like you following infection control precautions and other safe care practices are the key to prevention
- Infection prevention is everyone's responsibility

Infection Control is team work!

THANK YOU!!!