Infection Control

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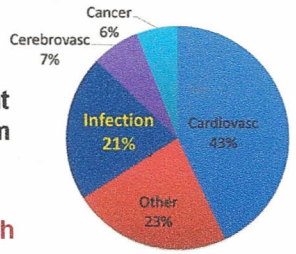
Objectives

- Define infection control in the hemodialysis clinic
- Detail implementation of the CDC Core Interventions in dialysis facilities
- Distinguish ways to overcome barriers to be successful in decreasing bloodstream infection rates
- Describe ways to move beyond checklists

Infection Control in Hemodialysis

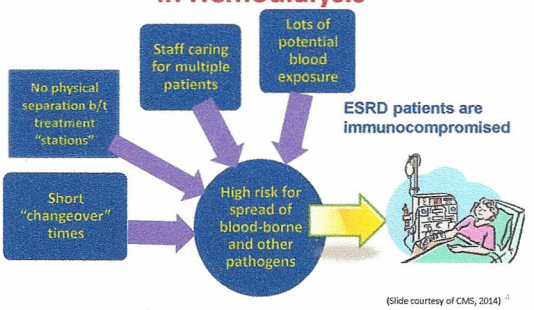
Infections:

- **A Major Patient Safety Problem in Dialysis**
- **2nd Leading Cause Of Death**



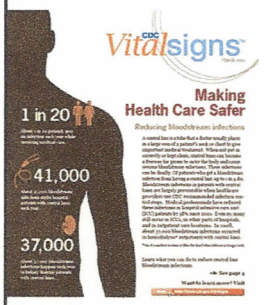
Proceedings of "ESRD: State of the Art and Charting the Challenges for the Future" Boston MA, April 2009, Ritz, CANS 2009

The Challenge of the "Perfect Storm" in Hemodialysis



(Slide courtesy of CMS, 2014)

Making Health Care Safer for HD Patients



Bloodstream infections (BSIs) are a dangerous complication of hemodialysis.

In 2009 the Centers for Disease Control and Prevention (CDC) started the Dialysis BSI Prevention Collaborative.

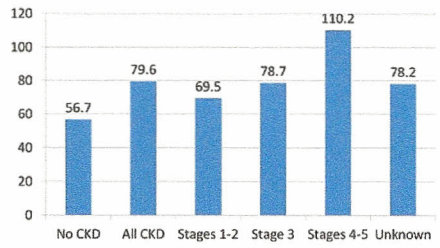
The goal of CDC's Dialysis BSI Prevention Collaborative is to work together to prevent BSIs in hemodialysis and spur a broader interest in preventing infections among the dialysis community.

Are the odds against Infection Control in HD Patients?

- Risk of acquiring **infection** is increased in HD population
  - Chronic Kidney Disease (CKD) requiring HD is the strongest risk factor for developing a blood stream infection (BSI)
  - Infection is the second leading cause of death in HD patients
  - 57% of HD infections are related to vascular access
  - Bacteremia is the most frequent catheter related infection
- **Infection related hospitalizations** in HD patients increased by 34% between 1993 – 2012
  - HD patients are 100 times more likely to acquire an invasive infection caused by MRSA than the general population
  - Average cost of treating a BSI is $24,034/episode

Adjusted Rates of Hospitalization for a Primary Diagnosis of Infection in Medicare Patients, Age 66 and Older, by CKD Status and Stage, 2012

Per 1000 Patient Years at Risk



Source: USRDS, 2014

Healthcare Providers CONTROL the odds against Infection in HD Patients

Healthcare providers hold the key to infection control by following three simple steps:

1. Prevent infection and transmission by adhering to the basic essentials of infection control procedures (hand hygiene & PPE)
2. Identify and treat infections effectively
3. Surveillance: Antimicrobial stewardship

Infection Control Basics

- Washing your hands is the **Single Most Important** precaution for preventing infection

- **Adequate hand hygiene is:**
  - Apply alcohol-based hand rub to cover all hand surfaces, rub to dry **OR**
  - Wet hands, apply soap to cover all surfaces, rinse-process to take 40-60 seconds

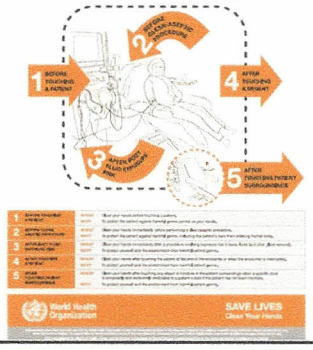
Why Wash Hands?

- Each year poor hand washing affects 1.7 million patients in the United States
- Annual cost of $6.5 billion
- More than 90,000 deaths per year

(Chen, 2009)

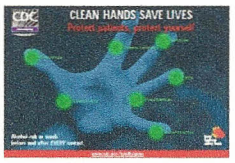
Your 5 Moments for Hand Hygiene

Haemodialysis in ambulatory care



When Should Hand Hygiene be Performed?

- **Before touching 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)**
- **When moving from a contaminated body site to a clean body site during patient care**
- **After touching medical equipment or other items at the dialysis station**
- **After glove removal**



Remember: perform hand hygiene between each patient or station

How many surfaces do you touch with your hands in a day?





What's growing on your hands?

Cell phones carry 10 times more bacteria than a toilet seat!

- 390 samples taken from hands and phones
- 92% of phones had bacteria on them
- 82% of hands had bacteria on them
- 16% of hands and 16% of phones had E. coli bacteria

(Locke, 2011)

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Hand Washing and Computers

- Transmission of bacteria from keyboards to hands increased:
  - 92% for MRSA
  - 50% for VRE
  - 19% for PSAE

(The Texas Department of Insurance, 2010)

Why Hand Hygiene & Surface Disinfection Are Vital

Organisms remain viable on surfaces for prolonged periods	
• Hepatitis B	>1 week
• Hepatitis C	16 hours to 4 days
• Influenza	1-2 days
• MRSA	7 days to 7 months
• VRE	5 days to 4 months
• C. Difficile spores	5 months

Healthcare workers touch as many as 7 surfaces after touching a contaminated one!

McLaughlin AC, Walsh F. Am J Infect Control 39(6):456-463, 2011
Kramer A, Schwebke I, Kampf G. BMC Infect Dis 6:130, 2006

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"SuperBugs"

- MRSA & VRE
- CRE (carbapenem-resistant Enterobacteriaceae)
  - Kill up to half of patients who get BSIs from them
  - These germs have become resistant to almost all antibiotics
- Other Unusual Pathogens
  - CR-P. aeruginosa, CR-A. baumannii;
  - Highly Drug-R Enterobacteriaceae, P. aeruginosa, A. baumannii;
  - Colistin/Polymyxin B-R P. aeruginosa, A. baumannii;
  - Carbapenem-I/R P. aeruginosa, A. baumannii;
  - Daptomycin NS & Linezolid-R Enterococcus spp.
  - Daptomycin NS & Linezolid-R & VI S. aureus
  - VRSA, VRSE

(CDC Vital Signs Report, 2013)

Personal Protective Equipment

- Gloves
- Gowns
- Face shields
- Protective eyewear and masks

PPE Concerns

- Study from Cleveland Veterans Affairs Medical Center reveals PPE can be dangerous to HCWs if not removed properly
- Volunteer HCWs were given a half milliliter of fluorescent lotion that glowed under a black light, rubbed lotion on gloved hands, wiped on gowns, and applied clean gloves
- Average contamination rate after PPE removal was 46%

(Kaplan, 2015)

Sequence for removing PPE

- Gloves
- Face shield or goggles
- Gown
- Mask or respirator

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CDC Press Release 2009

- Total of 33 identified HBV and HCV outbreaks outside of hospitals in 15 states during the past decade
  - 6 in hemodialysis centers
  - patients were exposed because health care personnel failed to follow basic infection control procedures
  - contaminated devices, equipment and surfaces

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Hepatitis C Virus (HCV) Transmission in HD Units

- "HCV is the most common bloodborne infection among chronic hemodialysis patients in the United States"
- Most likely due to blood contamination of the patient care environment or medical devices, caused by healthcare workers lapses in infection control practices

(Thompson et al., 2009)

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Common infection control breaches identified during HCV outbreak investigations

1. Failure to change gloves, perform hand hygiene between tasks or patients
2. Inadequate cleaning and disinfection of environmental surfaces between patients, e.g. treatment chair, dialysis machine
3. Clean and contaminated equipment/items stored together
4. Use of mobile cart to transport medications, supplies between patients
5. Preparation of injections in contaminated environment, e.g. at the dialysis station, where blood is being processed
6. Use of medication vials for more than one patient

(Patel et al., American Journal of Kidney Disease 2010;56:371-378)

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2016 CDC Health Advisory on Hepatitis C

HAN
HEALTH ALERT NETWORK

This is an official
CDC HEALTH ADVISORY

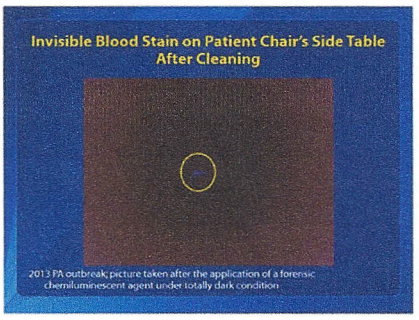
Distributed via the CDC Health Alert Network
Wednesday, January 27, 2016, 10:30 EST (10:30 AM EST)
CDCHAN-00386

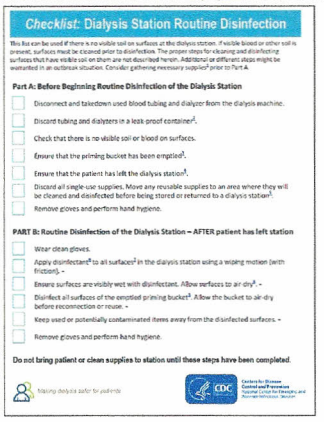
Summary

The Centers for Disease Control and Prevention (CDC) has received an increased number of reports of newly acquired hepatitis C virus (HCV) infection among patients undergoing hemodialysis. Infection control lapses in dialysis care could expose patients to HCV. Any case of new HCV infection in a patient undergoing hemodialysis should prompt immediate action. CDC is urging dialysis providers and facilities to:

1) Assess current infection control practices and environmental cleaning and disinfection practices within the facility to ensure adherence to infection control standards;
2) Address any gaps identified by the assessments;
3) Screen patients for HCV, following CDC guidelines, to detect infections, determine treatment potential, and halt secondary transmission; and
4) Promptly report all acute HCV infections to the state or local health department.

Healthcare Workers Thought It Was Clean!





Checklist: Dialysis Station Routine Disinfection

This list can be used if there is no visible soil on surfaces at the dialysis station. If visible blood or other soil is present, surfaces must be cleaned prior to disinfection. The proper steps for cleaning and disinfecting surfaces that have visible soil on them are not described herein. Additional or different steps might be warranted in an outbreak situation. Consider gathering necessary supplies[1] prior to Part A.

Part A: Before Beginning Routine Disinfection of the Dialysis Station

- ☐ Disconnect and takedown used blood tubing and dialyzer from the dialysis machine.
- ☐ Discard tubing and dialyzers in a leak-proof container[2].
- ☐ Check that there is no visible soil or blood on surfaces.
- ☐ Ensure that the priming bucket has been emptied[3].
- ☐ Ensure that the patient has left the dialysis station[4].
- ☐ Discard all single-use supplies. Move any reusable supplies to an area where they will be cleaned and disinfected before being stored or returned to a dialysis station[5].
- ☐ Remove gloves and perform hand hygiene.

PART B: Routine Disinfection of the Dialysis Station – AFTER patient has left station

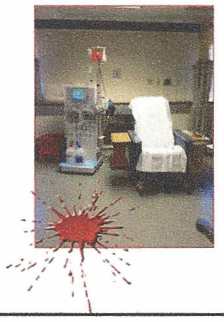
- ☐ Wear clean gloves.
- ☐ Apply disinfectant[6] to all surfaces[7] in the dialysis station using a wiping motion (with friction). –
- ☐ Ensure surfaces are visibly wet with disinfectant. Allow surfaces to air dry[8]. –
- ☐ Disinfect all surfaces of the emptied priming bucket[3]. Allow the bucket to air-dry before reconnection or reuse. –
- ☐ Keep used or potentially contaminated items away from the disinfected surfaces. –
- ☐ Remove gloves and perform hand hygiene.

Do not bring patient or clean supplies to station until these steps have been completed.

Making dialysis safer for patients

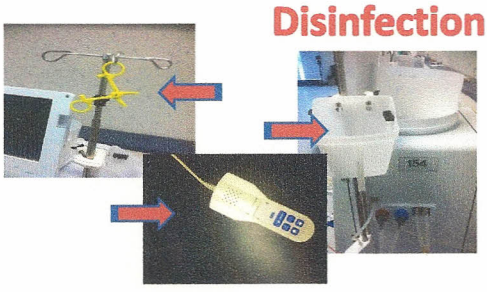
CDC

"Splash Zone"

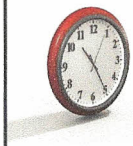


– Any items (i.e. Infusion pumps, IV poles, thermometers, medications, tape, etc.) taken to a patient station must be...
  - **Discarded**
  - **Disinfected**
  - **Designated**

Observations: Environmental Disinfection



Challenges



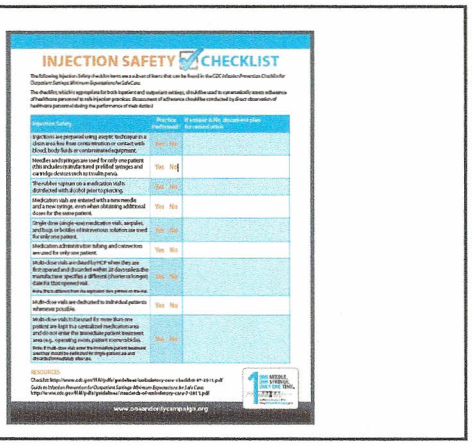
- Turnover, Turnover, Turnover
- Multiple shifts of patients
- Close proximity of patients in the dialysis environment

Input from Staff during Turnover

When asked how do you feel during turnover, staff replied...

– "overwhelmed"
– "pressure from patients"
– "behind schedule"
– "need a 5 minute mental break"

How can we stop breaches in infection control practices due to the pressures felt by staff during turnover?


INJECTION SAFETY CHECKLIST

www.oneandonlycampaign.org

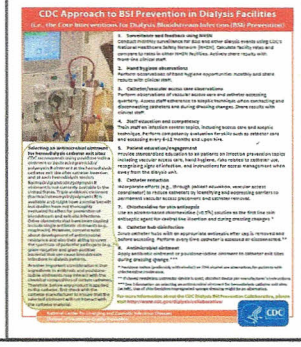
Safe Use of Medication Vials

- 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

ONE NEEDLE. ONE SYRINGE. ONLY ONE TIME.

CDC Approach to BSI Prevention in Dialysis Facilities

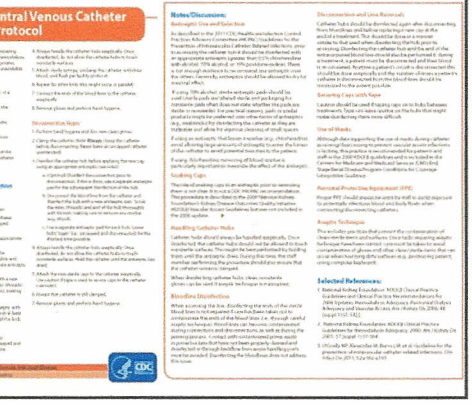
(i.e., the Core Interventions for Dialysis Bloodstream Infection (BSI) Prevention)


CDC Approach to BSI Prevention in Dialysis Facilities

Implement Evidence-Based Practice

- CDC Core Intervention #7 was implemented for all access care skin antisepsis

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.*


Hemodialysis Central Venous Catheter Scrub-the-Hub Protocol

"Scrub the Hub"

- CDC Core Intervention #8, "Scrub the Hub" was implemented for catheter connection and disconnection

8. Catheter hub disinfection
Scrub catheter hub with an appropriate antiseptic after cap is removed and before accessing. Perform every time catheter is accessed or disconnected.**

Impact Quality

- Following CDC protocols cuts BSIs in half
  - 32 percent decrease in overall bloodstream infections and a 54 percent decrease in vascular access-related bloodstream infections (ARBSIs) after CDC prevention guidelines were used (CDC Press Release, May 2013).
- Since our participation in the CDC Dialysis Collaborative, we have decreased our ARBSIs in half as well!

Put on Your Surveyor Hat

- What are surveyors looking for when they visit your clinic?
- What opportunities for improvement do you look for everyday?
- Let's play...

  "What's wrong with this picture?"

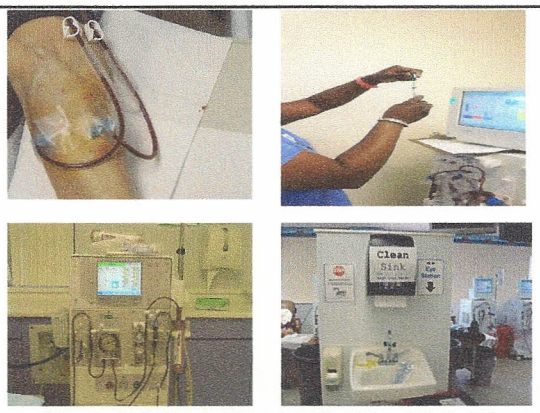
Keep in Mind the Top 7 Citations

Infection control ALWAYS most frequently cited –

HUGE opportunities for improvement.

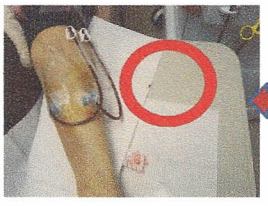
V-Tag	Rank	# Cited	Frequency
V113: Wear gloves, hand hygiene	1	478	37%
V122: Clean, disinfect surfaces & equipment	2	419	32.4%
V143: Aseptic techniques IV meds	5	187	14.5%
V147: CVC Care	6	184	14.2%
V116: Items taken to station disinfected, dedicated, discarded	7	183	14.2%
V115: PPE worn as appropriate	8	182	14.1%
V117: Clean/dirty areas, med prep, no common carts	13	143	11.1%

PDQ Data FY 2014: 1,293 recert surveys uploaded



(Pictures were staged for the purpose of this presentation with permission received by all parties.)

What's wrong with this picture?

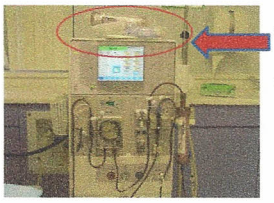


- Spilled blood left at the chairside
- Discard of any items with visible blood immediately

What's wrong with this picture?

- Drawing up medications at the patient station
- Prepare all individual patient medications in a clean area away from dialysis stations

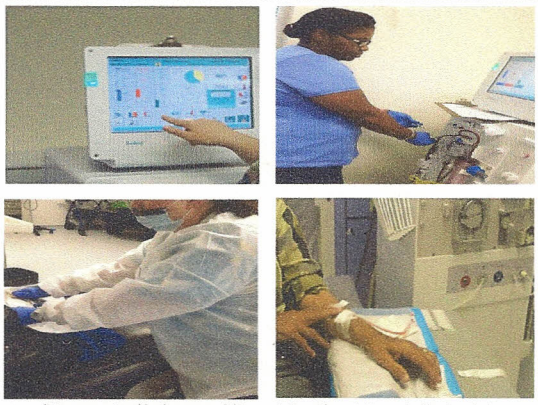
What's wrong with this picture?



- Next treatment supplies on the machine
- DO NOT bring patient or **clean supplies** to the dialysis station until all of the steps of disinfection have been completed.

What's wrong with this picture?

- Contaminated items in a designated "clean" sink
- Contaminated items should be discarded in a designated "dirty" area

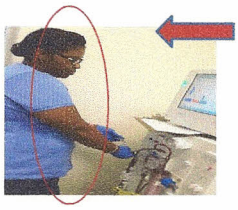


(Pictures were staged for the purpose of this presentation with permission received by all parties.)

What's wrong with this picture?

- Touching the machine without gloves
- Gloves must be worn when touching potentially contaminated items in the dialysis station

What's wrong with this picture?



- PPE wasn't worn during the administration of medications through the extracorporeal circuit
- PPE needs to be worn whenever there is a **potential for contact** with body fluids, hazardous chemicals, contaminated equipment and environmental surfaces.

What's wrong with this picture?

- Mask does not cover the nose
- **Masks should cover the nose and mouth** to prevent exposure from airborne contaminants from staff and patients.

What's wrong with this picture?

- Patient not wearing a glove when holding access site post-treatment
- Patients need to wear a glove when holding their access site post-treatment

What is the purpose of checklists?

- Provides step by step directions to educate staff on the proper order of a procedure
- Orients new employees of the proper steps of dialysis procedures
- Describes the purpose of dialysis procedures with emphasis on infection control
- Develops best practices (i.e. good habits) for all employees

Checklists Serve a Purpose

- The emergency landing on the Hudson River by Captain "Sully" Sullenberger in 2009 was achieved by using airline industry checklists (Downham, 2012).
- Reduces the potential for human error
- Hemodialysis centers participating in the CDC Dialysis Collaborative have decreased ARBSIs by half and have proved to sustain infection reduction by following CDC...

CHECKLISTS!

Moving Beyond the Checklist

Goal of Checklists

- What are organizations expecting when they provide staff with checklists/protocols and procedures?
- Compliance with best practices, right?
- What do staff hear when new checklists/protocols and procedures are introduced?

Outcome of Checklists

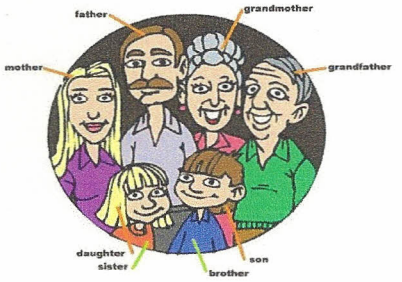
- Prevent infections
- Improve patient safety
- Increase patient satisfaction

Ways to Move Beyond the Checklist

- Coming together to be successful with best practices...
- Participate in meetings and discuss barriers with implementing new procedures.
- Ask questions when you don't understand the purpose or the expected outcome.
- Engage your patients – listen to them!
- Remember why you are here and why you chose to be a healthcare worker...

FOR THE PATIENTS!!!

When you don't think of them as patients, something amazing happens!



When you think of them as...

(Fill in the blank)

... Something amazing happens!

IDF 2015 Preceptor Class

Summary

- Infection control is necessary in dialysis clinics to prevent infections and improve patient safety.
- A CDC Collaborative Approach with infection prevention strategies helps identify and eliminate challenges with infection prevention in the dialysis environment.
- Implementation of the CDC Core Interventions decreases BSI rates in dialysis facilities.
- Moving beyond the mindset of infection control checklists requires healthcare workers and patients to understand the rationale behind the checklists and work together to achieve them.

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