

AHCA/NCAL Clinical Scenarios

Scenario: Cleaning and Disinfection of Shared Medical Equipment

Greenfield Long-Term Care Facility (LTCF) is home to 150 residents, many of whom require regular blood glucose monitoring due to diabetes. One of these residents, Betty Phillips, was recently admitted to an acute care hospital for jaundice and gastrointestinal symptoms. After viral testing was completed, she was diagnosed with acute Hepatitis B. She had never received blood transfusions and was not sexually active. Molly Jones, an epidemiologist at the state department of health, was notified.

To determine the source, an investigation was initiated, and 141 of the 150 residents were screened for HBV; three additional acute HBV cases and one unidentified chronic infection with hepatitis B of unknown duration were identified. Genetic testing of the new HBV revealed that all four new cases (one in the hospital and three in the facility) were related and also related to one of the two chronic cases in the facility. All residents who tested positive for HBV were diabetic and receiving regular blood glucose checks. An internal investigation revealed that blood glucose meters might not be adequately cleaned and disinfected between every use on residents. Some staff were using alcohol swabs to clean the equipment and others admitted to not always cleaning between residents since there was no visible blood. You are the Infection Preventionist at Greenfield. The Director of Nursing has asked you to take over the investigation and work with Molly at the Department of Health.



Scenario Review

- All residents affected shared a common diabetes diagnosis. As the Infection Preventionist investigating an outbreak, you would look for commonalities and similar traits among affected residents, particularly related to how the pathogen is transmitted. Common diagnoses can provide a clue that the outbreak could be related to a practice that is shared among all those residents. In this case, hepatitis B is transmitted by exposure to infected blood.
- The shared practice in this scenario that would expose residents to blood or body fluids was blood glucose monitoring with a shared blood glucose meter. A lapse in cleaning and disinfection practices of the shared blood glucose meter was identified. Inadequate cleaning and disinfection can lead to infection transmission and outbreaks among residents. The equipment manufacturer's instructions should be used to determine cleaning practices and products.
- In this scenario, a device contaminated with blood was not properly disinfected which led to multiple residents contracting a bloodborne pathogen, Hepatitis B. Hepatitis B can live in dried blood for a prolonged period of time. All items that are contaminated with blood and body fluids should be cleaned and disinfected using a product on EPA List S, after every use.
- This clinical scenario highlights the importance of ensuring that practices implemented to prevent infections, such as cleaning and disinfection, are performed consistently and adequately. It also emphasizes the need for education and ongoing auditing of practices related to the risk of transmitting bloodborne pathogens in a long-term care setting.

Questions

1. What immediate actions should be taken if an outbreak is suspected due to improper blood glucose meter disinfection?

a. Place all the residents in Contact Precautions for Hepatitis B

b. Take existing blood glucose meters out of circulation from use until proper disinfection has been confirmed

c. Take all the blood glucose meters out of use indefinitely

d. Buy all new blood glucose meters

e. Nothing. You have already identified the additional cases

The immediate action in this scenario is to take existing blood glucose meters from use until proper disinfection has been confirmed. Disinfection will not take a long time, whereas purchasing new equipment may take time. Since we have determined that all the affected residents are undergoing blood glucose monitoring, it is imperative that we address the likely source of transmission, the blood glucose meter. Hepatitis B does not require contact precautions according to the CDC [Isolation Precautions Guideline](#). Standard precautions should be applied, and this case reinforces that since one resident had chronic hepatitis B but was unknown. This is common with chronic hepatitis B and C. You can't take the blood glucose meters out of use indefinitely because they are needed to monitor blood glucose in the diabetic residents. Even though you have identified additional cases, there could be more transmission if the blood glucose meters are not cleaned and disinfected properly on a consistent basis going forward. Ideally, the facility should consider dedicating glucose monitors to a single resident and storing them in the resident rooms as a long-term solution. See [Considerations for Blood Glucose Monitoring and Insulin Administration](#) from the CDC.

2. True or False: Using an alcohol pad for disinfection of blood glucose meter surfaces is appropriate when you have limited time.

a. True

b. False

An alcohol pad is intended for use as an antiseptic on the skin or to disinfect a small surface such as an intravenous tubing hub. It is not large enough to disinfect a blood glucose meter appropriately. According to the CDC [Guidelines for Environmental Infection Control](#), isopropyl alcohol in concentrations of 60–90% is often used to disinfect small surfaces such as rubber stoppers of multiple-dose vials; however, alcohol evaporates rapidly, which makes extended contact times difficult to achieve unless items are immersed. In addition, alcohol may cause discoloration, swelling, hardening, and cracking of rubber and certain plastics after prolonged and repeated use and may damage equipment. Clean and

disinfect the blood glucose meter according to manufacturer's instructions and have those instructions stored for easy retrieval if asked by management or survey teams. These instructions will recommend an EPA-approved disinfectant to clean medical equipment, the disinfectant label should indicate it is effective against blood-borne pathogens.

3. What are the most important mitigation strategies in this scenario in terms of possible transmission? Check all that apply:

a. Ensuring staff clean and disinfect all blood glucose meters after every resident use

b. Ensuring access to and use of an EPA-approved disinfectant for bloodborne pathogens

c. Cleaning and disinfecting blood glucose meters in between residents only when they are contaminated with visible blood

d. Following the manufacturer's instructions for use (IFU) to develop cleaning and disinfection protocols

The [OSHA Bloodborne Pathogens Standard](#) states that all equipment be cleaned and decontaminated after contact with blood or other potentially infectious materials. Since the blood glucose meters are being used by multiple residents to test their blood, it's imperative that they are cleaned and disinfected to avoid contamination with a bloodborne pathogen such as Hepatitis B. The EPA has created [List S](#) for disinfectants that are effective against HIV, Hepatitis C, and Hepatitis B. It is important to use disinfectants that have demonstrated effectiveness against the targeted pathogens. Most manufacturers have instructions for cleaning their equipment. These should be reviewed when developing a protocol according to [CDC Environmental Infection Control Guidelines](#).

4. Molly has informed the facility that you need to conduct education and training for the staff related to blood glucose meter cleaning and disinfection. What should you include in your training?

a. Importance of standard precautions for injection and medication safety

b. Validated competency of cleaning skill/practice

c. Use of appropriate disinfectants to clean medical equipment

d. Where to find information on manufacturer instructions for cleaning reusable medical equipment

e. All of the above

According to the [CDC Core Infection Prevention Strategies](#), all of these topics would be appropriate for educating and training staff. It's important to make sure the manufacturer instructions are available and serve as the basis for cleaning reusable equipment since the cleaning process and products can vary between different brands of equipment.

5. Which of the following is not a good practice to ensure compliance with blood glucose meter cleaning and disinfection?

- a. Regular audits
- b. Direct observation
- c. Feedback

d. Culturing blood glucose meters monthly

Culturing for viruses on medical equipment or surfaces is extremely difficult and not routinely available. The other practices listed are recommended by CDC for performance monitoring and feedback in infection prevention and control. Regular audits of staff, ideally through direct observation, using and cleaning the equipment is a best practice. Mentoring new employees when using and cleaning medical equipment helps provide feedback to staff on following the facility’s policy and procedures and manufacturer’s instructions.

6. Describe what actions you would take if Molly reported this issue to you as the IP.

7. List any additional resources that would assist you in mitigating this type of situation.

Resources

MMWR Hepatitis B Outbreaks

[Hepatitis B outbreak in Assisted Living due to glucose monitors](#) (cdc.gov)

[Summary of health care associated Hep B outbreaks due to breaches in infection control](#) (cdc.gov)

Infection Prevention Core Practices

[Environmental Cleaning and Disinfection](#) (cdc.gov)

[Environmental Protection Agency \(EPA\) registered disinfectants effective against Hepatitis B](#) (epa.gov)

[Isolation Precautions Guideline](#) (cdc.gov)

[OSHA Bloodborne Pathogens Standard](#) (osha.gov)

[Health care-Associated Hepatitis B and C Outbreaks \(≥ 2 cases\) Reported to the CDC 2008-2019](#) (cdc.gov)

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