

# Hospital Epidemiology and Infection Control: Review Questions

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## QUESTIONS

Choose the single best answer for each question.

- Which of the following agents used for routine decontamination of hands in health care settings is most bactericidal and least irritating to the skin?**
  - Alcohol-based handrub
  - Antimicrobial soap and water
  - Chlorhexidine handwash
  - Plain soap and water
  - Triclosan handwash
- A 24-year-old man who is undergoing chemotherapy for Hodgkin's lymphoma is hospitalized with a temperature of 101°F and a generalized vesicular rash. He has not received the varicella vaccine and is uncertain if he had chickenpox as a child. Which of the following is the most appropriate empiric infection control measure to institute?**
  - Airborne precautions
  - Droplet precautions
  - Contact precautions
  - Airborne and contact precautions
  - Airborne and droplet precautions
- A medical resident is accidentally splattered with blood on his arms while performing cardiac resuscitation. The source patient, who is HIV-infected but is seronegative for hepatitis B and C, has been hospitalized with pneumocystis pneumonia. The resident immediately washes his arms with soap and water. On examination of his arms, there are no abrasions or skin lesions. Which of the following is the most appropriate medical management option for the resident?**
  - Initiate postexposure prophylaxis (PEP) immediately with 2 antiretroviral drugs
  - Initiate PEP immediately with 3 antiretroviral drugs
  - Monitor closely for any clinical features of acute retroviral syndrome
  - No further work-up or treatment
  - Perform baseline and follow-up serologic testing for HIV seroconversion
- A 62-year-old man with diabetes mellitus and chronic obstructive pulmonary disease is admitted to the intensive care unit in septic shock and respiratory failure. He is orally intubated, placed on a mechanical ventilator, and is being nursed in a semi-recumbent position. Which of the following can decrease this patient's risk of ventilator-associated pneumonia?**
  - Changing the ventilator circuit tubing every 48 hours
  - Chest physiotherapy
  - Optimization of endotracheal tube cuff pressures
  - Selective antimicrobial decontamination of the gastrointestinal tract
  - Use of disposable suction catheters
- Which of the following is a recommended strategy to prevent infections of nontunneled central venous catheters (CVCs)?**
  - Culture all catheter tips after removal to identify if infected
  - Guidewire exchange of malfunctioning catheter if no signs of infection
  - Immediate guidewire exchange of potentially infected catheters
  - Replace catheters after a maximum 7 days of use
  - Use antimicrobial impregnated catheters whenever possible

*(turn page for answers)*

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## ANSWERS AND EXPLANATIONS

1. **(A) Alcohol-based handrub.** The efficacy of alcohol-based handrub in reducing bacteria on hands is better than plain or antimicrobial soaps.<sup>1</sup> However, visibly soiled hands should be cleaned with soap and water. Alcohol-based handrubs have also been shown to be least damaging to the skin and require less time than soap and water for hand disinfection.
2. **(D) Airborne and contact precautions.** Certain clinical conditions or syndromes warrant institution of empiric infection control precautions to prevent transmission of epidemiologically important pathogens.<sup>2</sup> Airborne precautions, including private negative pressure rooms and use of respiratory protection (eg, N95 masks), are recommended for patients with infections such as tuberculosis, varicella, and measles, which are transmitted as airborne droplet nuclei ( $\leq 5$  mm). In addition, contact precautions are indicated for patients with varicella skin lesions. Droplet precautions are necessary in situations involving large droplet nuclei more than 5 mm (eg, influenza, invasive *Neisseria meningitidis* disease, pertussis).
3. **(D) No further work-up or treatment.** The need for PEP for HIV infection is based on the type of exposure and the infection status of the source.<sup>3</sup> In this instance, the exposure to blood occurred on intact skin and would be not considered an exposure. Hence, no further work-up is necessary. If the exposure resulted from a needle-stick injury or involved the mucosa or nonintact skin, PEP would have to be considered. The choice of 2 or 3 antiretroviral drugs is dictated by the status of the HIV infection of the source patient, with 3 drugs being recommended for more advanced disease.
4. **(C) Optimization of endotracheal tube cuff pressures.** Ventilator-associated pneumonia generally results from bacterial colonization of the airways and digestive tract and aspiration of upper airway secretions. Several strategies have been recommended to prevent ventilator-associated pneumonia.<sup>4</sup> Effective interventions include implementation of strict infection control measures, removal of nasogastric and endotracheal tubes as soon as possible, semirecumbent positioning, oral intubation, avoidance of gastric distension, drainage of condensate from ventilator circuits, and maintenance of adequate endotracheal tube cuff pressures to avoid aspi-

ration around the cuff. Strategies believed to be ineffective include routine changes of the ventilator circuits, use of disposable suction catheters, and chest physiotherapy. Moreover, selective digestive antimicrobial decontamination may contribute to the emergence of antibiotic resistance.

5. **(B) Guidewire exchange of malfunctioning catheter if no signs of infection.** Evidence-based guidelines have been published for the prevention of CVC infections.<sup>5</sup> In general, healthcare worker education and training, surveillance for CVC infections, hand hygiene, aseptic technique during insertion, and care of the CVC form the basis of infection prevention. Routine replacement of the CVC in order to prevent infection is not recommended. The culturing of all catheter tips in the absence of features of CVC infection or bacteremia is not useful. The use of antimicrobial impregnated CVC is recommended only if all other prevention strategies fail and the CVC is likely to remain in place for more than 5 days. Guidewire exchange of infected CVC is not recommended; however, malfunctioning CVC in the absence of infection can be replaced over a guidewire.

## REFERENCES

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