Clinical Issues

Bioburden and sterilization; credentialing private scrub nurses; administering intravenous medications

Question. In our operating room, we have had several discussions regarding bioburden and sterilization. Would you please discuss how bioburden affects sterilization?

Answer. Sterilization is the process by which pathogenic and nonpathogenic microorganisms, including spores, are killed.[1] A sterilized item is one that has been exposed to the sterilization process and is believed to be free of microorganisms.[2] Saturated steam under pressure is the safest, most practical means of sterilizing surgical supplies, fluids, the majority of surgical instruments, and other inanimate objects.[3] It is believed that microorganisms are destroyed by moist heat through a process of denaturation and coagulation of the enzyme-protein system within the bacterial cell.[4]

Saturated steam under pressure is used for sterilization of items for health care facilities unless heat and/or moisture damage to the item would result. Other sterilization methods include ethylene oxide, dry heat, and chemical sterilization.

The term *bioburden* refers to the amount, type, and resistance level of microbial contamination on an object at a given time.[5] Blood, bone, tissue, or visible soil of any kind, represent substances that contribute to a high bioburden level. It is not necessary for gross debris to be visible on an object for bioburden to be present. Bacteria are invisible to the naked eye, and millions could be present with no visible soilage of the object.

Reliable sterilization depends on contact of the sterilizing agent with all surfaces of the object to be sterilized. This sterilization reliability is affected by the bioburden on the object as well as the surrounding soil, crystals, oils, and other materials that may interfere with penetration of sterilant.[6] Established sterilization parameters are based on a low bioburden. The greater the number of organisms (bioburden), the greater the time needed to achieve sterilization. It is important, therefore, to reduce the bioburden to the lowest possible level before sterilizing an object. Physically removing gross soil and debris reduces the bioburden level.

Not all microorganisms are destroyed at the same time when subjected to heat or a chemical process. Ninety percent die in a specific time period.[7] When exposure to the process is continued in multiples of that time period, 90% of the surviving organisms die with each repeated exposure. If the sterilizing agent must spend some of the exposure time penetrating either organic or inorganic matter to reach the bacteria, fewer microorganisms will be killed in each specific time period. Depending on the amount of bioburden present at the onset of the sterilization process, an unsterile product could result.

Question. Recently, three of our surgeons have hired private scrub nurses. I am the OR supervisor, and my director of nursing has asked me to develop a credentialing procedure for these nurses. I am not familiar with credentialing. This is the first time we have had private scrub nurses in this hospital. Can you help me?

Answer. As the OR supervisor, you have the responsibility to see that the Joint Commis-

sion requirement to have a process to ensure that all care givers are competent is met in your area. Because private scrub nurses are not a part of the usual hospital/facility process of employment, credentialing is one method for ensuring competence of these individuals.

Credentialing provides accountability to patients undergoing surgical intervention and to the facility in which the surgical intervention occurs. Credentialing benefits and protects the public as well as the person being credentialed.

Credentialing of private scrub nurses varies from hospital to hospital. I will share with you my credentialing process at the hospitals where I practice. One hospital requires a copy of the nursing license for verification. Another requires the following:

- demographic data,
- personal data—copy of license, practice history,
- education data—curriculum vitae, professional societies,
- references,
- clinical privileges desired—specialty, subspecialty,
- professional liability—carrier and copy of policy, amount of coverage, liability history, other coverage,
- review and monitor by sponsoring physician, and
- cardiopulmonary resuscitation (CPR) verification.

Another hospital in which I work requires a copy of my nursing license, yearly continuing education verification, and liability coverage and carrier.

To develop a credentialing process, begin by writing a policy statement identifying the targeted individuals and stating the purpose of the credentialing policy. Next, define the procedure for obtaining practice privileges. You should identify the application process, specifying the desired information. Categories to consider are:

- licensure,
- educational qualifications,
- continuing professional development,
- certification,
- professional practice history,
- description of desired/approved position privileges,
- orientation to health care facility, and
- mechanism of review and continued practice privilege.

In many cases, the actual review of applications and submitted credentials is done by the hospital credentials committee. When an application has been submitted by a private scrub nurse, you, as the OR supervisor, should be present at the meeting of the credentials committee and have a voice in the approval or denial of practice privileges.

Question. In our hospital, we rotate through the local room where we are asked to administer intravenous medications. I feel uncomfortable doing this because sometimes I am unfamiliar with the medication that I have to administer and its side effects. Could you offer some suggestions on how to handle this situation?

Answer. This question is a familiar one and a concern for many perioperative nurses. Compile a list of the medications commonly used in the local room, including local anesthetics. Identify which medications and agents may be administered by the nurses. To ensure that you are working within hospital policy, have the list approved by the OR and pharmacy committees. Identify the actions, side effects, and adverse reactions of the medications. Post the list in the local room for easy reference. Also, make sure you document the verbal order from the physician when administering medications.

The AORN "Recommended practices for monitoring the patient receiving local anesthesia" indicate that patients receiving local anesthesia should be monitored for reaction to drugs and for behavioral and physiological changes.[8] Only by having a thorough knowledge and understanding of the medications being administered can the perioperative nurse meet this practice responsibility.

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Notes

1. L J Atkinson, M L Kohn, *Berry & Kohn's Introduction to Operating Room Technique*, sixth ed (New York City: McGraw-Hill, 1986) 99.

2. S S Block, *Disinfection, Sterilization, and Preservation,* third ed (Philadelphia: Lea & Febiger, 1983) 885.

3. B J Gruendemann, M H Meeker, *Alexander's Care of the Patient in Surgery*, eighth ed (St Louis: C V Mosby Co, 1987) 63-64.

4. *Ibid.*

5. J A Kneedler, G H Dodge, *Perioperative Patient Care: The Nursing Perspective*, second ed (Boston: Blackwell Scientific Publications, 1987) 228.

6. Block, *Disinfection, Sterilization, and Preservation*, 11-14.

7. Kneedler, Dodge, *Perioperative Patient Care: The Nursing Perspective*, 229-230.

8. "Recommended practices for monitoring the patient receiving local anesthesia," *AORN Standards and Recommended Practices for Perioperative Nursing* (Denver: Association of Operating Room Nurses, Inc, 1987) III:16-1 to 16-2.

If you have questions you would like addressed in the "Clinical Issues" column of the AORN Journal, *please send them to the AORN Consultation Division, 10170 E Mississippi Ave, Denver, CO 80231. All questions will be considered for inclusion in this column.*

Blood Pressure Treatment Tested for Diabetics

There is increasing evidence that not only are diabetics likely to become hypertensive, but that people who are hypertensive are more likely to become diabetic, according to a press release from Vanderbilt University (VU) Medical Center, Nashville.

This prompted a physician at VU to initiate a series of tests on drugs that are commonly used to treat high blood pressure. His goals are to determine the safety of the drugs for diabetics and find a drug that stabilizes the glucose serum levels and controls blood pressure.

Diuretics and beta-blockers have been the traditional therapy for hypertension, but they can elevate blood glucose levels and serum cholesterol or other lipids, which could lead to atherosclerosis. The physician surmised that if he controlled blood glucose, he may be able to control the adverse effects related to it.

One study will compare guanabenz, an alpha agonist that acts on the involuntary nervous system to reduce blood vessel resistance, with hydrochlorothiazide (HCTZ), a diuretic. Ten medical centers will be involved in the study in which 10 patients between the ages of 21 and 65 years will be divided into two groups for a four-month testing period. They must be taking oral medications only, be otherwise healthy, and not be dependent on insulin.

The other study will test 20 diabetic patients in three groups. One group will receive captopril, an angiotensin-converting enzyme that decreases both intravascular fluid volume and blood vessel dilation; one group will receive HCTZ; and the third group will receive a combination of the two drugs. The patients must be at least 18 years old and otherwise healthy, and can be insulin dependent. One of the main aspects of this study, which will involve five other centers, is to determine whether captopril reduces serum glucose.

Correction to Guidelines

There is an error in the article, "Recommendations for prevention of HIV transmission in health-care settings," which appeared in the November issue of the *AORN Journal.* The error is in Table 1, on page 994. In the first column entitled "Beginning prevalence of HIV infection," the fourth line should be 1.0%, not 15.0%. The corrected guidelines are reprinted in this issue for your convenience.