Contamination of Phosphor Plates (4/09)


The objective of this study was to determine if phosphor plates used in predoctoral clinics are microbiologically contaminated and to identify the source of contamination (e.g., from skin during handling or residual intraoral contamination). Forty-five of 300 phosphor plates (15%) were randomly selected for examination. The plates were pressed into individual blood agar plates, incubated using standard techniques at 37°C, and monitored for 72 hours. The number, size, distribution, and variety of resulting colonies were noted. A representative of each type of colony was selected to be Gram stained using the standard technique. Of the plates, 42.2% were uncontaminated, 57.8% yielded bacterial colonies, and 15.6% of those colonies demonstrated hemolytic growth. The hemolytic growth included combined alpha and beta hemolysis and beta only hemolysis. Six colonies were gram-positive rods and 7 were gram-positive cocci.

Meticulous infection-control techniques are inevitable and continuous reinforcement and training for staff and students are mandatory. Periodic gas sterilization of phosphor plates may be necessary.

DECS Comment: Intraoral digital sensors/plates come into contact with mucous membranes and ideally, therefore, should be cleaned and heat-sterilized or high-level disinfected between patients. At this time, however, sensors/plates cannot withstand heat sterilization or complete immersion in a high-level disinfectant. Until technology allows this, the Centers for Disease Control and Prevention (CDC) recommends at a minimum, using barrier protection to reduce gross contamination during use and because using a barrier does not always protect from contamination, after removing the barrier, the device should be cleaned and disinfected with an EPA-registered intermediate-level disinfectant after each patient.

The study was conducted in a dental school setting in which the plates were handled by multiple individuals (e.g., dispensary staff, students, instrument processing technicians) which could account for some of the contamination. However, the finding of hemolytic bacteria on the plates indicates that some of the contamination could have been from intraoral sources. Other studies have also shown cross-contamination to be an issue when using digital sensors/plates. This reinforces the need for using measures to prevent cross-contamination. In the present study, most of the contamination was found along the edges of the plates. The location of the contamination suggests that it would be beneficial to pay extra attention to these areas during cleaning and disinfection procedures. While the authors suggested using ethylene oxide (EtO) to sterilize the plates periodically, EtO is not available in USAF treatment facilities. Another suggestion was to use an intermediate-level disinfectant with a short contact time when preparing the plates for reuse. Because the sensors/plates vary by manufacturer and are expensive, manufacturers should be consulted regarding specific disinfection products and procedures.

USAF Guidelines for Infection Control in Dentistry

The following apply for digital radiography sensors/plates:

a. Use FDA-cleared barriers.

b. To minimize the potential for device-associated infections, after removing the barrier, clean and disinfect using an EPA-registered hospital disinfectant with an intermediate-level activity after each patient.

Selected References

- USAF Guidelines for Infection Control in Dentistry.