

Infection Connection – Post-incident Decontamination

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One night last week, following a double shooting that left two patients mortally wounded, the paramedic notified me that one EMS unit needed to remain out of service for an extended period of time, for proper decontamination. While the handling of this call left the unit and crew unusually contaminated, requiring extensive cleanup, all patient contacts require a certain level of cleanup appropriate for the contamination.

Following patient care and documentation, the primary function of the crew then becomes the role of creating a safe, clean, and healthy environment for patients, the patient's family and our EMS crew. Included in this function is the cleaning and disinfection of all EMS unit surfaces, which includes floors, walls, counters, seats, equipment, and even the units cab.

But, how many times have you been witness to a patient moved off the stretcher, the wrinkles smoothed out of the sheet and the crew decide it is good for one more run. What about a busy EMS unit making call after call without wiping the floor out or disinfection of the cot? It happens, and much to the risk of the patient and the healthcare provider alike.

Establishing and adhering to a good program is the key to effective cleaning and disinfection of all surfaces and equipment in the EMS unit. This article focuses on cleaning and disinfection of the EMS unit and equipment, and provides guidelines for a good post-incident disinfection program.

Many surfaces in your EMS unit can harbor disease-causing germs. Although not directly involved in disease transmission, these surfaces may indirectly contribute to secondary cross-contamination by the hands of crewmembers or by contact with medical instruments that will subsequently come into contact with patients. You can divide unit surfaces into two sub-groups: medical transport surfaces and medical equipment surfaces.

Medical Transport Surfaces

Medical transport surfaces include bench seats, chairs, work space counters, grab bars, walls, and floors and are considered non-critical items that require low-level disinfection. Cleaning and disinfection of these surfaces can be ensured by removal of dust and dirt on a routine basis. This can be accomplished using water and a detergent or a low-level, EPA-registered, hospital grade disinfectant designed for general cleaning.

The Environmental Protection Agency (EPA) regulates and registers all low-level disinfectants. To be considered a hospital grade disinfectant, manufacturers must test their germicidal products against three microorganisms: *Staphylococcus aureus*, *Salmonella choleraesuis*, and *Pseudomonas aeruginosa*. Products may also be tested against a variety of other microorganisms. In today's age of antibiotic resistance (MRSA and VRE) and concern with bloodborne viruses, good disinfection has taken on an all-new meaning. It is always important for the disinfectant to be mixed according to the manufacturer's label in order to get the expected results.

Dust removal before the scrubbing of floors is an important part of cleaning and disinfecting. Dust removal prior to scrubbing will rid the surface of a large portion of debris, dirt, and dust that, if uncollected will affect the disinfecting capability of the disinfectant used. A small hand-held dust mop head may be ideal for dust removal. Many departments use a small handheld broom to sweep dust from the floor of the EMS unit, however the sweeping of floors with a broom is not a good plan because particles become airborne, microorganisms are attracted to this dust and can be transferred throughout the back of the EMS unit and even into the crew's cab. Where a dust mop is not available, a small broom dipped into disinfectant can be used. Dipping the broom into the disinfectant will eliminate dust particles from becoming airborne, therefore reducing the chance of a potentially hazardous occurrence.

Despite the fact that the EMS unit floor does not play a major role in the transmission of disease, cleaning and disinfection of the floor on a regular basis is important.

Other surfaces such as work area counters, walls, stretcher mattresses and equipment should be cleaned and disinfected with an EPA-registered disinfectant, following the manufacturer's recommendations. This disinfectant used should be a tuberculocidal.

Choices may be a phenolic disinfectant or a chlorine solution 0.5% -0.05% sodium hypochlorite (1:10 –1:100 dilution of bleach). Cleaning methods may include the use of a bucket or a conventional spray bottle method. With the "bucket method," a cleaning rag is dipped into a bucket containing an EPA-registered disinfectant and then used to drench all environmental surfaces. The environmental surfaces are left wet for ten minutes before being wiped dry with a clean towel. The "bucket method" allows for direct and longer contact between the surface and the disinfecting agent. Studies suggest that conventional disinfection (spray bottle method) may be associated with a higher frequency of persistent

contamination of environmental surfaces with organisms such as vancomycin-resistant Enterococcus. A clean cloth should be used for cleaning each time the EMS unit is cleaned. Walls should be spot cleaned of splashes, and completely cleaned when they are dirty.

One way to simplify the cleaning and disinfection process is disposable wipes. These wipes are now widely available and make routine cleanup easy. Some wipes kill Hepatitis B virus, HIV-1, VRE MRSA and over 100 other microorganisms. Routine use of these wipes on hard surfaces provides disinfection and reduces the possibility of cross-contamination. You should make sure the wipes you are using are EPA-registered, hospital grade disinfectants and therefore effective in the patient care environment. With the addition of wipes you can simply wipe and toss, with no dirty rags to keep up with, and storage of the wipes are easy. Always follow the manufacturer's recommendations for cleaning times and use.

Medical Equipment Surfaces

Medical equipment must be properly cleaned and disinfected as well. Medical equipment can be divided into two categories. Critical items are instruments or objects that are in contact with mucous membranes. Such items include respiratory therapy equipment such as laryngoscopes. Non-critical items are those that do not touch the patient or touch only the intact skin. Such items include stethoscopes, blood pressure cuffs, oxygen saturation equipment, and other medical accessories. All these items are used routinely in EMS, and a clear understanding of this category is essential.

EMS policies should identify what level of cleaning and disinfecting of items are indicated to reduce the risk of infectious exposure.

The cleaning and disinfecting of semi critical medical devices or patient-care equipment, such as reusable laryngoscope blades that come in contact with mucous membranes, should follow a process that kills all microorganisms (e.g., viruses and tubercle bacilli) but resistant bacterial spores. This high-level disinfection should always be done between uses to reduce the risk of transmission of microorganisms to other patients. The high-level disinfection process may include exposure to an EPA-registered "sterilant" chemical, for a short exposure time of 20-45 minutes or as directed by the manufacturer.

It is important that reusable items be cleaned thoroughly before processing because organic material (e.g., blood and proteins) may inactivate chemical germicides and protect microorganisms from the disinfection or sterilization process.

Nondisposable, noninvasive items such as blood pressure cuffs contaminated with blood or other body fluids should be cleaned and disinfected thoroughly with an EPA-registered disinfectant agent after each use.

Patient care equipment intended for single use should not be reprocessed and used. These disposable items usually cannot be cleaned and sterilized adequately or are made of materials that may be damaged by chemical or heat disinfection or sterilization.

Single use EMS equipment is becoming more readily available, and at a cost that makes it more appealing than ever before. An example of this equipment is FlexAir™ disposable pillow/patient support, by Graham Medical these single use inflatable pillows can be used for the comfort of the patient and then disposed of. New splinting options are now available that provide excellent immobilization and patient comfort and are also one time use, this even includes an excellent vacuum splint, EMS Econo-Vac™ from Medical Devices International. Disposable laryngoscope blades are another excellent choice that simplifies post-incident decontamination. Options like these make cleanup easier and as a bonus there is no concern over retrieving equipment from the receiving emergency department.

EMS Unit Cab

When we talk EMS unit cleaning and disinfection we often only think of the patient compartment. However, to reduce the chance of infectious exposures and cross-contamination routine cleaning of the cab is important. This includes wiping down surfaces that may be touched following patient contact such as door handles (interior and exterior), steering wheel, radio equipment, laptops or data terminals, electrical switches, clipboards, etc. This may be done with our spray disinfectants, or disinfectant wipes. As an added bonus this should also serve to reduce the passing of flu viruses between crewmembers.

Conclusion

All personnel working in EMS must routinely follow basic infection control practices. While the risk of infectious exposures cannot be completely eliminated, the appropriate cleaning and disinfection of environmental surfaces can minimize the risk. Since we are not sure of what cleanup the previous crew completed, it is a good idea to begin the shift with a routine cleanup not unlike our post-incident disinfection.

Medics performing cleaning and disinfection must possess knowledge and proficiency in proper cleaning and disinfection techniques. In addition, appropriate personal protection equipment (e.g. , gloves, goggles, and gowns) must be worn during cleanup.

Each member plays a vital role in maintaining a clean, attractive, and safe environment for patients, and crews. A review of current infection control policies and practices should be an ongoing process in your local department.

References

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