

Create a Response



Dealing with Carbapenem Resistant Enterobacterales
in Your Veterinary Practice



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CREATE
Carbapenem Resistant Enterobacterales Animal Testing and Epidemiology

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Create a Response

Very little is known about CRE in veterinary hospitals, so the majority of the recommendations below have been adapted from human recommendations or are based on author experience. There is much work to be done to establish true evidence-based recommendations.

**AFTER
identification of a
CRE case or
cluster you
should:**

- 1 **Immediately isolate the animal**
- 2 **Ensure laboratory confirmation**
- 3 **Inform public health officials and exposed humans**
- 4 **Enhance infection control strategies throughout facility**
- 5 **Identify if transmission has occurred**
- 6 **Use antibiotics responsibly in your practice**

Healthcare professionals should take immediate action when a CRE case is identified, as the following steps are much more likely to be effective when promptly enacted.

Immediately isolate the animal and adjust management plan

Animals with suspected or confirmed CRE should be isolated from general patient populations immediately. This may be in an isolation ward or area that is specifically designated for CRE patients. Cages or runs should be at least 1 cage space or 3 feet away from other animals when possible. Isolation procedures should include clear identification of the patient as CRE positive and establishing a specific zone (3 ft is recommended) in which PPE will be worn. Additionally, patients should not leave this area unless medically necessary (i.e. for imaging). CRE positive patients should not be allowed to defecate in shared areas.

Employees that handle CRE positive patients should be highly aware of relevant protocols and well trained in the use of PPE. If more than one CRE positive patient is identified, facilities should implement “cohort nursing,” in which a single nurse covers all CRE cases during a specific shift. If this is not possible, CRE patients should be handled last during times. PPE for CRE cases should include shoe covers, leak proof gowns or coveralls, and gloves. Hair should be tied back, and gloves should be changed between tasks or if soiled. In general, gowns and coveralls can be reused if they remain dry and intact for the same patient. However, gloves and shoe covers should be discarded and replaced with new sets between each patient interaction.

Ensure laboratory confirmation

Clinicians should work with their diagnostic laboratory to ensure that phenotypic and/or genotypic confirmation of CRE isolates is performed by a method described under “How to Recognize CRE.” CREATE can serve as a reference lab if your laboratory is not able to confirm CRE. Alternatively, public health laboratories may be able to help with this process. Confirmation that an isolate is actually CRE is important to justify the following actions that you will take and to ensure the entire response team understands the importance of the result. If CRE is misidentified, and full action taken, then this may undermine trust in laboratory results in future responses.

Inform public health officials and exposed humans

Depending on the jurisdiction and reporting requirements, a diagnostic laboratory may or may not report the isolation of CRE to public health officials. It is the attending clinician’s responsibility to ensure that their own personal and facility reporting requirements are met as described under “CREATE a Plan.”

Veterinary staff, owners, and any other individual that has interacted with a CRE positive animal has a right to know about the exposure. Knowledge of exposure gives those affected the agency to pursue testing through their own physician if they have concerns. Alternatively, local health officials may work with you to screen as appropriate.

Currently the risk of transmission of CRE from animals to people is not well understood. There are several reports of people associated with positive animals harboring the same CRE strain, but directionality is difficult to establish. During the outbreak at PennVet, employees qualified for screening by a program supported by the Philadelphia Department of Public Health only if the employee:

- Was undergoing treatment for cancer
- Received a bone marrow or organ transplant
- Was receiving immune suppressing medications to treat another condition (e.g. inflammatory bowel disease, lupus)
- Had a weakened immune system due to a medical condition(e.g., chronic kidney disease, HIV)
- Had a planned hospitalization or medical procedure in the upcoming 3 months
- Had indwelling medical devices

At PennVet, 12 staff self-identified for testing, and all were found to be negative for colonization.

Enhance infection control strategies throughout facility

A veterinary facility should always have a strong infection prevention program in place, but a case of CRE in the facility should trigger additional messaging to staff. Leadership should routinely remind staff of the importance of hand hygiene and appropriate PPE. Ensure that there is adequate access to alcohol-based hand sanitizer and that re-processing of equipment is done to standard. Environmental contamination can be quite high following a case of CRE, but it can be limited with careful attention to the basic tenets of infection control during an outbreak.

Identify if transmission has occurred and what those animals may have in common

If an animal is identified to harbor a CRE, it may be prudent or necessary to determine if there has been transmission to other animals in your hospital. Transmission assessment may be a daunting task, but it is necessary to take an aggressive approach. Halting the spread of CRE is superior to ignorance or inaction. The decision to screen additional patients is situation specific and may or may not be required by local public health officials. Screening can be performed by culture or PCR, both of which are available through the CREATE program. Currently, our prices are \$13.00 for culture and \$52.00 for PCR. These tests are run 'at cost' by the CREATE program.

Tracing patient contacts can help determine if animals within the same ward have become colonized, particularly in an intensive care unit or other setting with vulnerable patients. This strategy is most useful when there is a single case of CRE in a hospitalized patient. Contact tracing involves testing in-patients whose stay overlapped with the CRE positive patient prior appropriate precautions being implemented. At the time of CRE identification, CREATE highly recommends that all hospitalized patients currently in the affected ward be tested and that precautions be put in place prior to results. Relevant personnel may consider developing a list of overlapping patients, so they can be flagged for follow-up testing if already discharged or tested at readmission.

If multiple patients are identified to be infected or colonized with CRE, staff must determine if there is ongoing transmission within the facility. One approach to consider is the use of point prevalence surveys (PPS). This involves testing every patient that meets relevant criteria at a specific time point. For example: in our hospital, every patient present on a Tuesday at 8 am that had been in the hospital for at least one night was tested during a PPS. A typical recommendation to rule out ongoing in-facility transmission is to have 2-3 consecutively negative PPS. It is important to note that point-prevalence surveys without significant molecular epidemiology of isolates will not distinguish if an animal admitted to the hospital is already colonized. Therefore, they do not represent in-facility transmission. If there is concern regarding a community reservoir, admission screening and discharge testing must be implemented in order to evaluate in-facility transmission.

If multiple patients are identified as colonized by the same CRE strain, an attempt to identify a source is necessary. It is possible for patient-to-patient transmission to occur via hands, clothing, or equipment of caretakers. However, procedures (i.e. surgical intervention, endoscopy etc) have also been implicated in human and veterinary settings. Common procedures undergone by positive patients should be identified and ultimately guide environmental or equipment surveillance (described further below). It is also important to re-evaluate these procedures and to determine if associated infection prevention protocols can be improved.

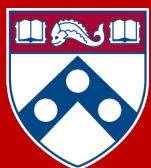
Perform environmental cleaning and disinfection +/- determine if there are environmental reservoirs

A thorough cleaning and disinfection of the clinical spaces should be performed following identification of a CRE positive patient. If possible, the space should be cleared of patients completely and “terminally cleaned.” Ideally, a professional company would do so, but staff of veterinary clinics with specific training and supervision should be able to complete this process. Particular attention must be paid to spaces where the CRE positive animal was housed or bathed. CRE are easily killed with most commercial disinfectants provided the manufacturer’s instructions for use (MIFU) are followed.

Targeted surveillance of CRE has proven valuable in our facility to help identify both sources and issues with infection control strategies. Samples are collected using an electrostatic cling cloth (i.e., Swiffer pad) and send to the lab in a whirlpak or zipped bag. The culture is enriched, and results can be interpreted in 48-72 hours.

Positive sites in our facility have included high touch points (i.e., cage latches, drawers, computer keyboards) and outdoor elimination runs. We also use cultures prior to placing additional patients into runs or cages that have previously housed a CRE positive patient. CREATE offers facilities environmental cultures for \$13.00.

The steps outlined throughout this document reflect foundational characteristics of an appropriate CRE response and are designed to lay the groundwork for individual facility planning. Infection identification and control may be intimidating, particularly when the agent is unfamiliar. However, a swift and thorough response following identification of CRE in a veterinary facility is more than possible. It is critical to patient and staff safety, maintenance of trust, and longevity of the affected organization.



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