

CRE Investigation Overview

Enterobacteriaceae are a group of bacteria normally found in the human gut. CRE are Enterobacteriaceae resistant to a class of antibiotics called carbapenems. CRE can be spread in healthcare settings from patient to patient, by healthcare workers' hands and through environmental contamination. Some CRE produce enzymes called carbapenemases which break down carbapenem antibiotics. Carbapenemase-producing CRE (CP-CRE) are of primary public health concern and as such, an investigation should be opened within 24 hours of confirming identification of CP-CRE. Notify facilities, providers, and infected/colonized patients as appropriate. Conduct an investigation to assess the risk factors for transmission in the affected healthcare setting(s). Implement control measures such as contact precautions as soon as possible. Discuss the need for screening of potentially exposed individuals. The appropriate screening can be performed through the State Laboratory of Public Health (SLPH) and the Antibiotic Resistance Laboratory Network (ARLN) free of charge; the Communicable Disease Branch (CDB) is available to help coordinate these screenings. Screening recommendations may differ between healthcare settings. CDB is available for consultation regarding investigations - please call the Epidemiologist on Call at 919-733-3419. Refer to <https://www.cdc.gov/hai/outbreaks/docs/Health-Response-Contain-MDRO.pdf> for additional information.

Basic Steps of a CRE Investigation

<p>1. Confirm Case Meets Definition</p>	<ul style="list-style-type: none"> • If the organism is <i>Escherichia coli</i>, <i>Enterobacter</i> spp., or <i>Klebsiella</i> spp. and is resistant to one or more carbapenems (minimum inhibitory concentrations of ≥ 4 mcg/ml for meropenem, imipenem, and doripenem or ≥ 2 mcg/ml for ertapenem) it meets case definition for CRE • If no phenotypic or molecular testing has been performed on the isolate, arrange to have it sent to the State Laboratory of Public Health for characterization • We request facilities capable of performing phenotypic or molecular testing save isolates testing positive for carbapenemase production or for a specific mechanism of resistance, as they may be asked to forward these to SLPH for additional characterization • Implement appropriate precautions for patient based on the healthcare setting as soon as CRE is identified
<p>2. Notify Facilities/Providers</p>	<ul style="list-style-type: none"> • Notify the submitting facility/provider(s) and conduct a healthcare investigation <ul style="list-style-type: none"> <input type="checkbox"/> Review healthcare exposure(s) (typically for the past 30 days) <input type="checkbox"/> Notify identified healthcare facilities • Ensure appropriate control measures are in use (i.e. appropriate precautions based on the healthcare setting and appropriate environmental cleaning)
<p>3. Perform Risk Assessment</p>	<ul style="list-style-type: none"> • Review patient's exposures and risk factors including: <ul style="list-style-type: none"> <input type="checkbox"/> Recent international hospitalizations <input type="checkbox"/> Antibiotic use within the past 30 days <input type="checkbox"/> Hemodialysis treatment <input type="checkbox"/> Recent domestic hospitalizations (notify facility if appropriate) <input type="checkbox"/> Recent procedures (endoscopies, surgeries, etc.) <input type="checkbox"/> Indwelling medical device use (intravenous catheters, urinary catheters, tracheostomy tubes, etc.) <input type="checkbox"/> Open wounds (if yes, inquire which wound clinic is attended and notify if appropriate) <input type="checkbox"/> Recent Long Term Care Facility admission (document name of facility and notify if appropriate)
<p>4. Conduct IP Assessment (in consultation with CDB)</p>	<ul style="list-style-type: none"> • Assess infection prevention (IP) practices and opportunities for transmission <ul style="list-style-type: none"> <input type="checkbox"/> Risk of transmission (indwelling devices, total care, etc.) <input type="checkbox"/> Hand hygiene compliance of healthcare personnel <input type="checkbox"/> Does the patient share a room? <input type="checkbox"/> Was the patient on appropriate precautions for the healthcare setting during their healthcare stay(s)? <input type="checkbox"/> Did the patient share any devices for procedures (endoscopes, etc.)? <input type="checkbox"/> Are there any environmental reservoirs (Do cleaning services use FDA-approved cleaners)? <input type="checkbox"/> Interfacility communication regarding MultiDrug-Resistant Organisms if the patient was transferred • A site visit to one or more facilities may be warranted (consult CDB for more information)
<p>5. Conduct a Contact Investigation</p>	<ul style="list-style-type: none"> • CDC recommends screening roommates of CP-CRE cases and others that are epidemiologically linked due to recent healthcare exposure • The following are considerations to make when assessing who to screen: <ul style="list-style-type: none"> <input type="checkbox"/> Recent healthcare exposure(s) <input type="checkbox"/> Mechanism of resistance <input type="checkbox"/> Was the patient on appropriate precautions based on the healthcare setting? <input type="checkbox"/> Infection prevention assessment • CDB is available to facilitate colonization screening and coordination with the Antibiotic Resistance Laboratory Network
<p>6. Prospective Surveillance</p>	<ul style="list-style-type: none"> • Monitor infection prevention practices to reduce transmission within the facility • Monitor for new CRE or CP-CRE cases at the facility

For more information: <https://epi.publichealth.nc.gov/cd/lhds/manuals/cd/toc.html>