# Extracted Content from https://ndc.services.cdc.gov/case-definitions/carbapenemase-producing-organisms-cpo-2023/

Carbapenemase-Producing Organisms (CPO) 2023 Case Definition | CDC  
Skip directly to site content  
Skip directly to search  
An official website of the United States government  
Here's how you know  
Official websites use .gov  
A .gov website belongs to an official government organization in the United States.  
Secure .gov websites use HTTPS  
A  
lock  
(  
) or  
https://  
means you've safely connected to the .gov website. Share sensitive information only on official, secure websites.  
National Notifiable Diseases Surveillance System (NNDSS)  
Explore Topics  
Search  
Search  
Clear Input  
For Everyone  
About About National Notifiable Diseases Surveillance System  
What is Case Surveillance?  
Case Surveillance Modernization  
Infectious Disease Tables  
Non-Infectious Disease Data  
Technical Resource Center  
Case Surveillance in Action  
Contact Us  
View all  
Related Topics:  
NDC Application  
View All  
search  
close search  
search  
National Notifiable Diseases Surveillance System (NNDSS)  
Menu  
Close  
search  
For Everyone  
About About National Notifiable Diseases Surveillance System  
What is Case Surveillance?  
Case Surveillance Modernization  
Infectious Disease Tables  
Non-Infectious Disease Data  
Technical Resource Center  
Case Surveillance in Action  
Contact Us  
View All  
Related Topics  
NDC Application  
View All  
National Notifiable Diseases Surveillance System (NNDSS)  
About About National Notifiable Diseases Surveillance System  
What is Case Surveillance?  
Case Surveillance Modernization  
Infectious Disease Tables  
Non-Infectious Disease Data  
Technical Resource Center  
Case Surveillance in Action  
Contact Us  
View All  
February 28, 2023  
Case Definitions  
Message Mapping Guides  
Supporting Documents for Implementation  
Event Codes & Other Surveillance Resources  
Carbapenemase-Producing Organisms (CPO)  
2023 Case Definition  
Carbapenemase-Producing Organisms (CPO)  
2023 Case Definition  
NOTE:  
A surveillance case definition is a set of uniform criteria used to define a disease for public health surveillance. Surveillance case definitions enable public health officials to classify and count cases consistently across reporting jurisdictions. Surveillance case definitions are not intended to be used by healthcare providers for making a clinical diagnosis or determining how to meet an individual patient’s health needs.  
CSTE Position Statement(s)  
22-ID-04  
Subtype(s)  
Carbapenemase-producing organisms, clinical  
Carbapenemase-producing organisms, screening  
Background  
Carbapenemase-producing organisms (CPO) are an epidemiologically important group of multidrug-resistant pathogens classified by the Centers for Disease Control and Prevention (CDC) as an urgent threat to public health.  
1  
Since the detection of  
Klebsiella pneumoniae  
carbapenemase (KPC)-producing  
Klebsiella pneumoniae  
in the United States in 1996, CPO have spread throughout the country and include many organism-carbapenemase combinations.  
2,3  
Infections caused by CPO are difficult to treat and associated with high mortality.  
4  
CPO commonly contain mobile genetic elements, such as plasmids, that can facilitate transmission of resistance genes within and between bacterial species and in turn, facilitate transmission between patients. Early detection and implementation of infection prevention and control strategies are necessary to prevent further spread of CPO.  
Laboratory Criteria  
Confirmatory laboratory evidence:  
Positive phenotypic test  
\*  
result for carbapenemase production in a specimen,  
OR  
Positive molecular test  
\*\*  
result detecting a carbapenemase gene  
\*\*\*  
(with or without organism identification),  
OR  
Detection of carbapenemase gene  
\*\*\*  
by next generation sequencing (NGS)  
‡  
\* Phenotypic testing methods include but are not limited to: metallo-β-lactamase test, modified Hodge test, Carba NP, carbapenem inactivation method (CIM), modified carbapenem inactivation method (mCIM), EDTA-modified carbapenem inactivation method (eCIM), or immunochromatography tests (ICT).  
\*\* Molecular tests for carbapenemase genes include but are not limited to: Cepheid Xpert Carba-R, Nanosphere VERIGENE, Streck ARM-D, validated laboratory-developed NAAT.  
\*\*\* Carbapenemase genes include: bla  
KPC  
, bla  
NDM  
, bla  
VIM  
, bla  
IMP  
, bla  
OXA-48  
, but other carbapenemase genes include but are not limited to: bla  
SIM  
, bla  
GIM  
, bla  
SPM  
, other bla  
OXA  
, etc.  
‡ It is not necessary to report organisms with known chromosomal carbapenemase genes, including but not limited to SME+ Serratia marcescens, unless they have additional non-chromosomal carbapenemase genes.  
Note: The categorical labels used here to stratify laboratory evidence are intended to support the standardization of case classifications for public health surveillance. The categorical labels should not be used to interpret the utility or validity of any laboratory test methodology.  
Criteria to Distinguish a New Case from an Existing Case  
A specific organism/carbapenemase combination in a person should be counted as a separate case from other organism/carbapenemase combinations in the same person (e.g., KPC+  
K.  
pneumoniae  
vs. NDM+  
E. coli).  
A specific organism/carbapenemase combination can include a carbapenemase gene(s) without an organism detected (e.g., NDM+ no organism vs. NDM+  
E. coli).  
A person classified as a clinical case should not be counted as a screening case thereafter for the same organism/carbapenemase combination (e.g., patient with known NDM+  
E.  
coli  
infection who later has NDM+  
E. coli  
colonization should not be counted as a separate case).  
A person classified as a screening case can be later counted as a clinical case with the same organism/carbapenemase combination (e.g., patient with NDM+  
E.  
coli  
peri-rectal screening swab who later develops NDM+  
E. coli  
blood stream infection would be counted twice, once in each category). This is the only way that the same organism/carbapenemase combination can be counted twice for the same person.  
A case with a known carbapenemase but unknown organism should only be counted once for that carbapenemase (e.g., an NDM+ screening case is later screened at a different facility and tests NDM+ positive and no organism is identified again).  
Case Classification  
Confirmed  
Any specimen that meets the confirmatory laboratory evidence.  
Case Classification Comments  
The following provides guidance for health departments to use for the further classification of CPO cases. Each CPO report should be stratified by whether the specimen was  
clinical  
(i.e., collected for the purpose of diagnosing or treating disease in the course of normal care) versus  
screening  
(i.e., collected for the detection of colonization and not for the purpose of diagnosing or treating disease).  
Because it can be difficult to differentiate screening specimens from clinical specimens based on microbiology records, screening cases should generally be limited to CPO identified in rectal, peri-rectal, axilla, groin, or stool specimens. Specimens from such sites can be assumed to be for screening unless specifically noted otherwise. Laboratories may also note screening specimens from other sites (e.g., wound, tracheostomy or central line sites). Laboratories do not need to change their practice; public health wants to identify all CPO whether they come from screening or clinical specimens.  
Each report should also specify carbapenemase gene(s) when known (e.g., bla  
KPC  
, bla  
NDM  
, bla  
OXA-48  
, bla  
VIM  
, bla  
IMP  
, etc.), listing all genes within the same specimen (e.g., NDM+ OXA-48+  
E. coli  
).  
References  
Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.  
Yigit H, Queenan AM, Anderson GJ, et al. Novel carbapenem-hydrolyzing beta-lactamase, KPC-1, from a carbapenem-resistant strain of Klebsiella pneumoniae [published correction appears in Antimicrob Agents Chemother. 2008 Feb;52(2):809]. Antimicrob Agents Chemother. 2001;45(4):1151-1161. doi:10.1128/AAC.45.4.1151-1161.2001  
Antibiotic Resistance & Patient Safety Portal (AR&PSP) AR Lab Network Data. Atlanta, Georgia: U.S. Department of Health and Human Services, CDC. https://arpsp.cdc.gov/  
Bonomo RA, Burd EM, Conly J, et al. Carbapenemase-Producing Organisms: A Global Scourge. Clin Infect Dis. 2018;66(8):1290-1297. doi:10.1093/cid/cix893  
Back to Top  
Sources  
Print  
Share  
Facebook  
LinkedIn  
Twitter  
Syndicate  
Content Source:  
Case Definitions  
Message Mapping Guides  
Supporting Documents for Implementation  
Event Codes & Other Surveillance Resources  
National Notifiable Diseases Surveillance System (NNDSS)  
NNDSS receives and shares case data from state, local, and territorial health departments to help public health monitor, control, and prevent serious diseases.  
View All  
About About National Notifiable Diseases Surveillance System  
What is Case Surveillance?  
Case Surveillance Modernization  
Infectious Disease Tables  
Non-Infectious Disease Data  
Technical Resource Center  
Case Surveillance in Action  
Contact Us  
View All  
Sign up for Email Updates  
Contact CDC  
Organization  
Policies  
Web Policies  
Languages  
Languages  
Español  
Language Assistance  
Archive  
CDC Archive  
Public Health Publications  
Contact Us  
About CDC  
Organization  
Policies  
Web Policies  
Languages  
Languages  
Español  
Language Assistance  
Archive  
CDC Archive  
Public Health Publications  
HHS.gov  
USA.gov