

COMMUNICABLE DISEASES EXERCISES AND RESOURCES

1



Rabies Scenarios

Created with a little help from
Dr. Emilio Debess, DVM

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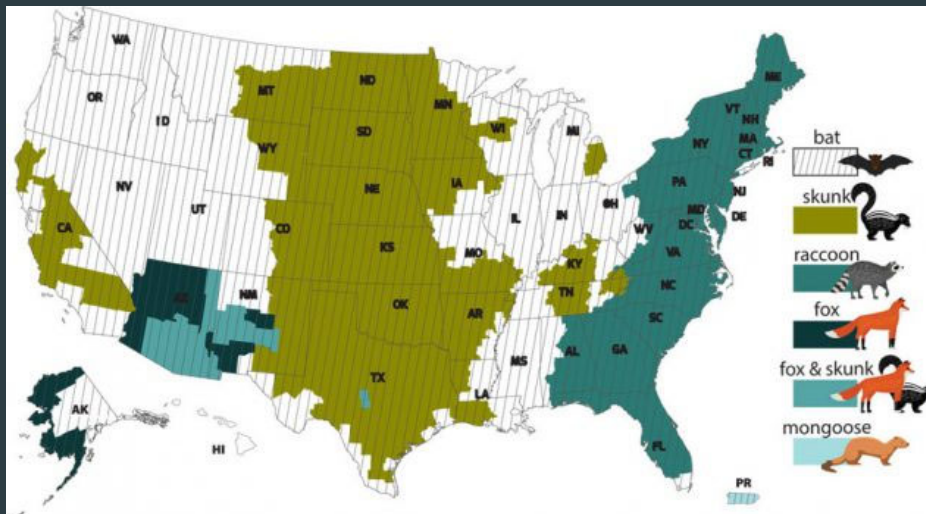
Rabies Overview

- ▶ Virus
- ▶ Infected animals act oddly - wild animals are unafraid of humans, bats fly in daylight or crawl and hiss, profuse salivation, CNS symptoms
- ▶ Spread by saliva entering broken tissue
- ▶ In OR, WA, ID bats are the only reservoir - cats and foxes can be infected predators.
- ▶ No terrestrial rabies in Oregon!



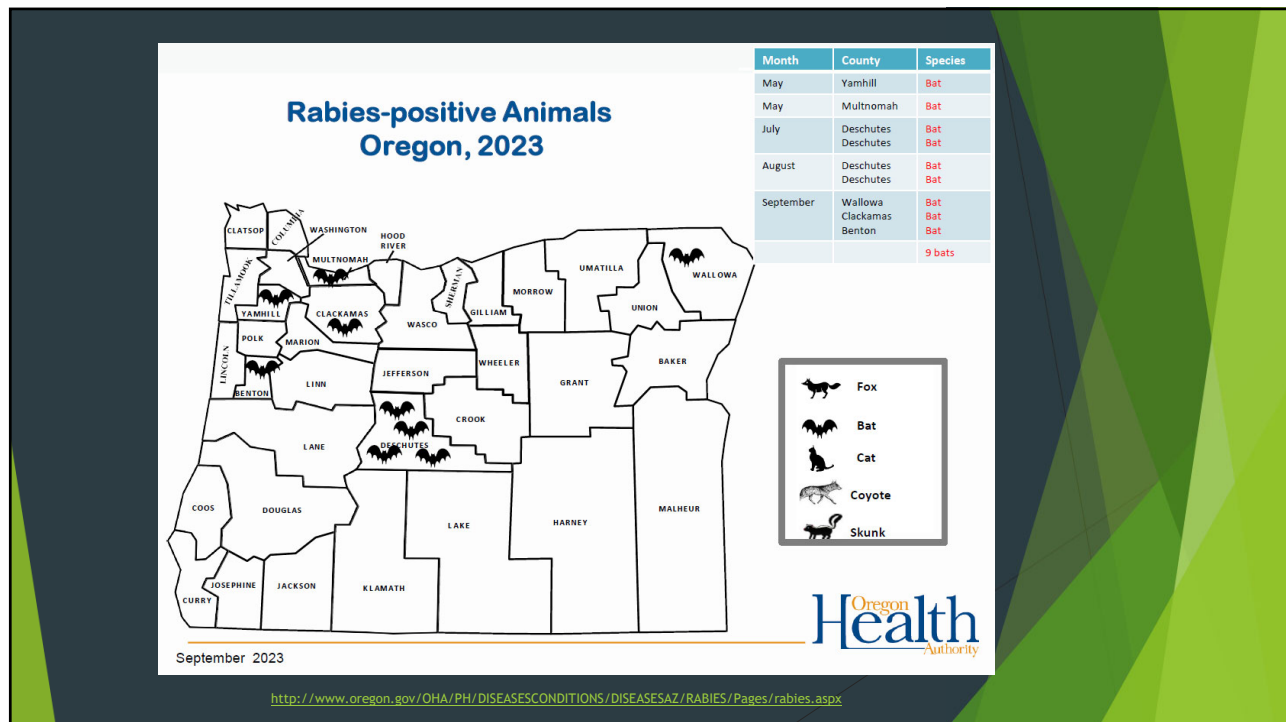
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Common carriers of rabies in the US



https://www.cdc.gov/rabies/exposure/animals/wildlife_reservoirs.html

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Rabies Overview

- ▶ If someone is bit by a rabid animal:
 - ▶ Wash the wound immediately with soap, water and flushing
 - ▶ If medical care is needed, provider may prescribe antibiotics and give a Tetanus booster
- ▶ Post exposure prophylaxis (PEP) should be initiated as soon as possible. This consists of:
 - ▶ Rabies immune globulin RIG
 - ▶ 4 vaccines given on days 0, 3, 7, 14
- ▶ Know where someone can get rabies PEP in your county


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To PEP or not to PEP? To Test or not to Test?

- ▶ Recommendation for PEP or testing of an animal head varies by....
 - ▶ Type of animal involved
 - ▶ Vaccination status of the animal
 - ▶ The circumstances of the bite
 - ▶ Provoked?
 - ▶ An actual bite or just contact?
 - ▶ Behavior of the animal—was it acting weird or was it just scared

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Acute and Communicable Disease Prevention



Animal Bites and Rabies Investigative Guidelines December 2018

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To assess the risk of rabies in persons bitten or otherwise possibly exposed to recommend rabies post-exposure prophylaxis (RPEP) to those who need it, and to provide counseling and reassurance to those who don't.
2. As necessary to arrange for the capture and either confinement (10-day observation) of a live dog, cat or ferret, or the laboratory examination of an animal head. This may involve coordination with other agencies, e.g., the Humane Society, county sanitarians, animal control and local law enforcement.
3. To identify zoonotic sources of infection.

1.2 Reporting Requirements

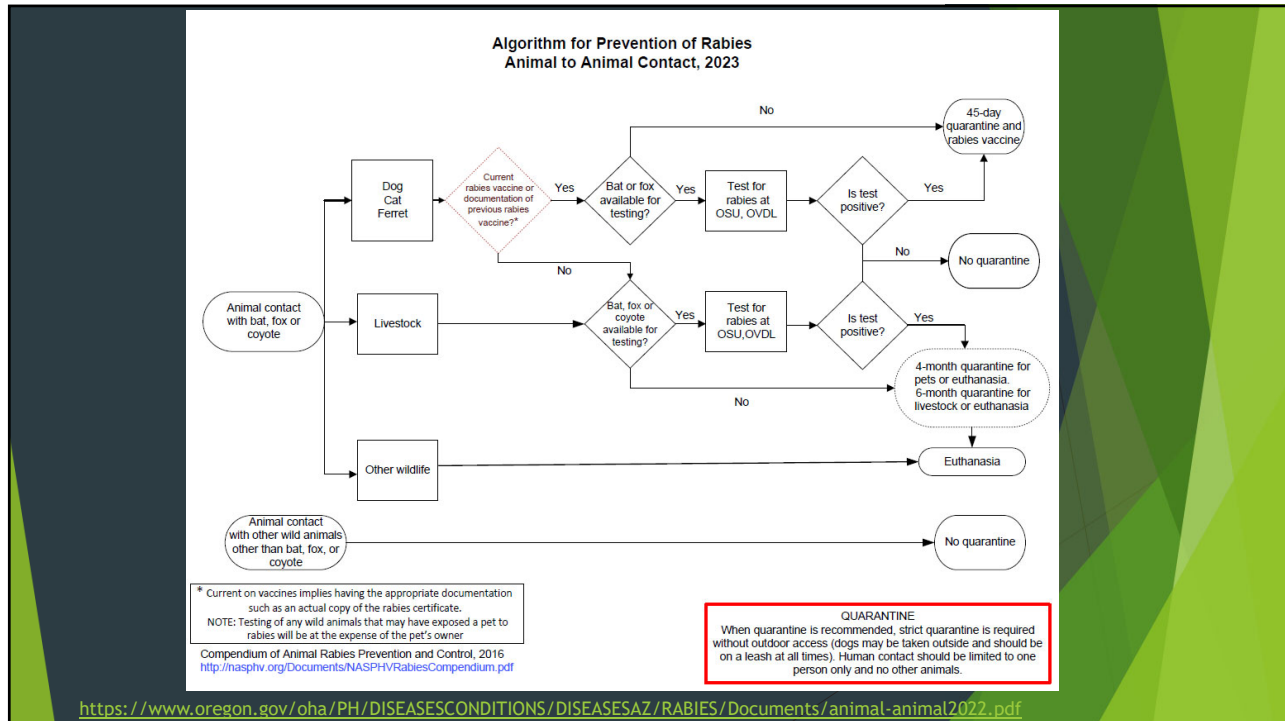
1. Anyone with knowledge of humans being bitten by potentially rabid animals (e.g., physicians, veterinarians, animal control personnel, law-enforcement officials, or animal owners), is required to report such incidents to the Local Health Department (LHD) within one working day.
2. Laboratories: Any confirmed case of rabies in an animal and any suspected or confirmed case of human rabies must be reported immediately (day or night) to the LHD. If the LHD cannot be reached, the Acute and Communicable Disease Prevention (ACDP) Section of Oregon Health Authority (OHA) should be contacted at 971-873-1111.

1.3 Local Health Department Reporting and Follow-Up Responsibilities

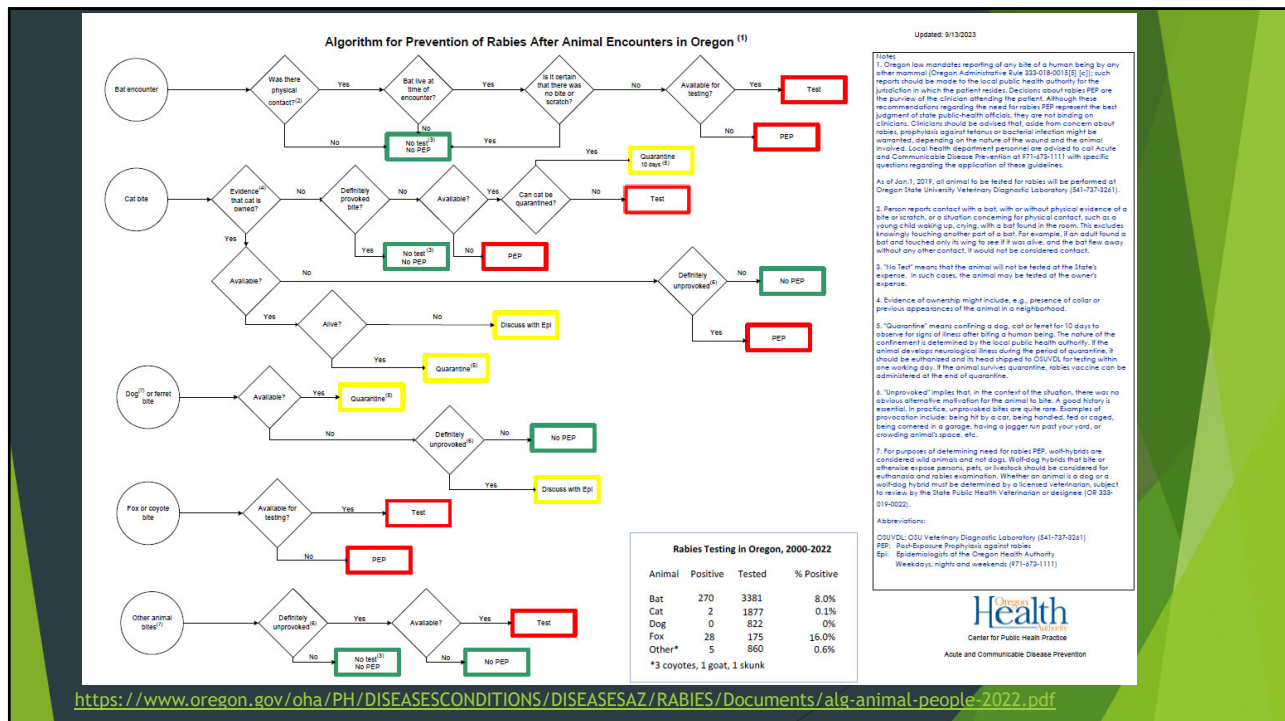
1. Investigate all reports of animal bites, on the day of the report whenever possible.
2. Determine, in consultation with OHA on-call staff as necessary, whether the exposure constitutes a significant risk for rabies, in which either empiric RPEP or testing of the animal is to be recommended. (N.B., a recommendation to test the animal should be made if, and only if, RPEP would be recommended if the animal proves to be rabid.) If testing is to be recommended, solicit approval from OHA staff for testing at OHA expense.
3. Enter into Orpheus any exposure, associated details, and ultimate disposition in which
 - empiric RPEP is recommended; or
 - testing of the animal is recommended.

December 2018

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General Rules of Thumb

- ▶ If it's a bat, fox or coyote - assume it has rabies
- ▶ Cats are sometimes rabid because they hunt bats
- ▶ If a wakeful child is involved - it's a provoked bite
- ▶ Rabies virus is in an infected animal's saliva in the days before they die, which is why we quarantine to see if they die
- ▶ Your state epi is here to help!

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1. A man calls to say that he was jogging close to his house when a dog ran out of its yard and bit him on the ankle. He wants to know what to do. What do you tell him?

- a. Advise him to seek medical attention for wound care.
- b. His health care provider may wish to consider antibiotics and a tetanus booster.
- c. Because he knows where the dog lives, advise him to report the bite to animal control so they can place the dog under a 10-day post-bite quarantine.
- d. The dog is probably vaccinated if it lives in his neighborhood. This is a low risk exposure so treat the wound, tell the jogger to be more careful next time.

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2. A family is having a BBQ. The parents look over just in time to see their two-year-old girl pick up a dead, desiccated bat on the deck and put it in her mouth. (Yes, this actually happened!) What do you tell them?

- A. Provide RIG and vaccines for the girl, as soon as possible.
- B. Bats rarely carry rabies in Oregon, no PEP.
- C. Rabies virus does not survive in saliva after an animal dies. No PEP recommended.
- D. Children will put anything in their mouths. Don't leave dead bats lying around.

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Emerging Pathogen Threats in Oregon

Carbapenem-Resistant Organisms and *Candida auris*

Slides from OHA Healthcare-Associated Infections Program



The logo for the Oregon Health Authority, featuring the word "Oregon" in a smaller, orange font above the word "Health" in a large, blue serif font, with the word "Authority" in a smaller, orange font below "Health".

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LOCAL NEWS f X ✉

'Superbug' cases rising in Las Vegas Valley, here's what is being done:

OCTOBER 13, 2023 | 8 MIN READ

Dangerous 'Superbugs' Are on the Rise. What Can Stop Them?

Stamping Out Superbugs

A Clear and Present Danger



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Multidrug-resistant organisms (MDRO)

- Bacteria or yeast that have developed resistance to multiple antibiotics

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Multidrug-resistant organisms (MDRO)

- Bacteria or yeast that have developed resistance to multiple antibiotics



Difficult or impossible to treat



High morbidity and mortality



Healthcare associated



Healthcare outbreaks

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Two MDRO of concern:

Carbapenem-resistant organisms (CRO)



Carbapenem-resistant *Klebsiella pneumoniae*
source: CDC

Candida auris (*C. auris*)



Candida auris
source: CDC

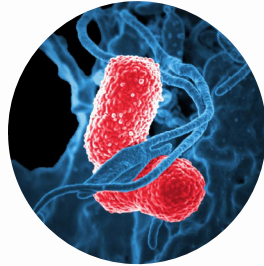
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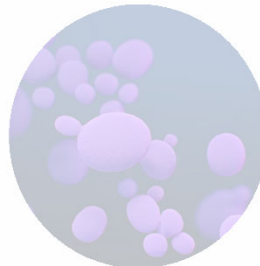
Two multidrug-resistant organisms of concern:

Carbapenem resistant organisms (CRO)



Carbapenem-resistant *Klebsiella pneumoniae*
source: CDC

Candida auris



Candida auris
source: CDC

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Carbapenem resistant organisms (CRO)



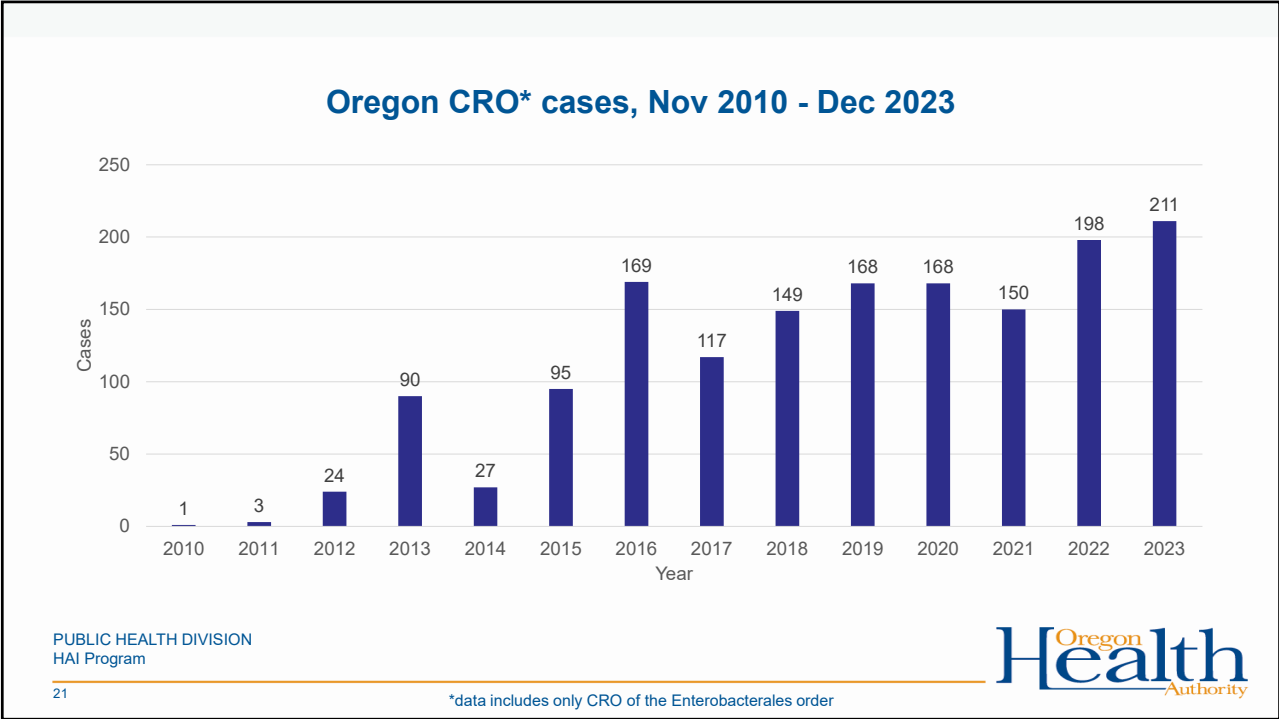
Carbapenem-resistant *Klebsiella pneumoniae*
source: CDC

- Carbapenems
 - Class of broad spectrum β -lactam antibiotics
 - Meropenem, imipenem, ertapenem
 - “antibiotics of last resort”
- CRO = bacteria that have developed resistance to carbapenem antibiotics

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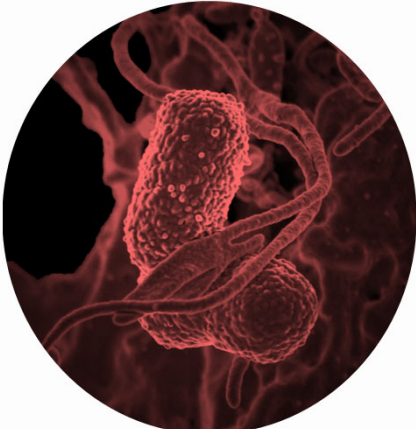
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Not all carbapenem resistant organisms (CRO) are equal



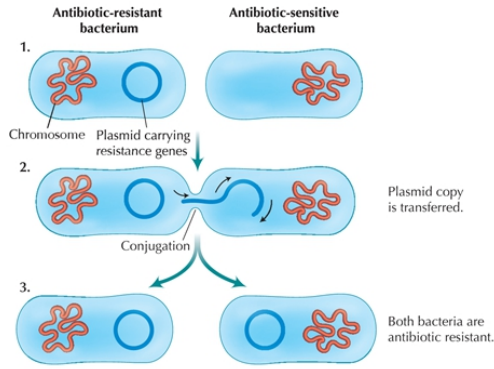
- Some CRO can share information and “convert” normal bacteria into CRO
- These are called **carbapenemase-producing organisms (CPO)**

*Carbapenem-resistant *Klebsiella pneumoniae**
source: CDC

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Carbapenemase-producing organisms (CPO) can easily spread antibiotic resistance among bacteria



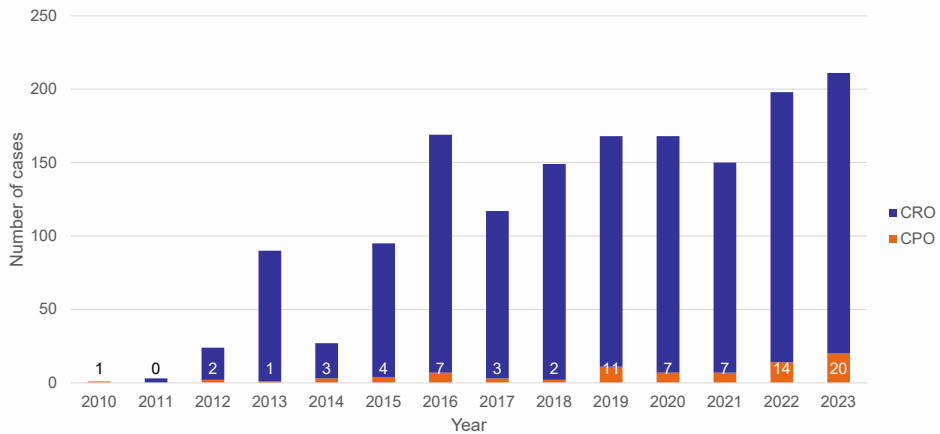
- Carbapenemases are proteins that destroy carbapenem antibiotics.
- Once a bacteria “knows” how to make a carbapenemase, it becomes a CPO
- CPOs can share the “blueprint” for making carbapenemases through plasmids

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Oregon CRO and CPO cases, Nov 2010 – Dec 2023



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*data includes only CPO of the Enterobacterales order

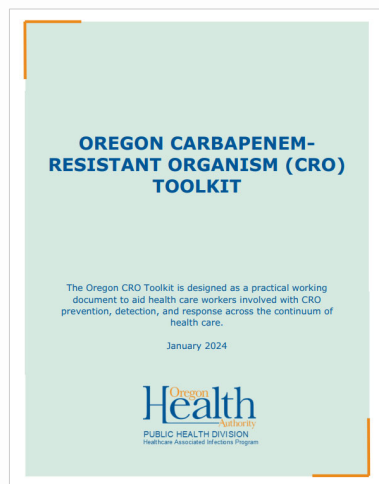
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Preventing and Responding to CRO

- Refer to the guidelines to determine how to classify a case
 - Appendix in CRE guidelines to help
- More aggressive recommendations for CPOs; HAI Program involvement

https://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/COMMUNICABLEDISEASE/REPORTINGCOMMUNICABLEDISEASE/REPORTINGGUIDELINES/Documents/CRE_lguide.pdf

Preventing and Responding to CRO



- Toolkit updated January 2024
- Infection control focused
- Available at: <https://rebrand.ly/CRO-Toolkit>

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Antibiotic	<i>Escherichia coli</i>	
	Susceptibility	MIC
Ceftazidime	R	>=64
Ertapenem	R	>1
Ceftriaxone	I	2
Ciprofloxacin	R	>=4
Gentamycin	S	<=2
Imipenem	I	2
Levofloxacin	R	>=8
Meropenem	S	<=1
Tobramycin	S	<=2

Name of organism

"minimum inhibitory concentration"
- how much antibiotic is needed to stop growth

Name of antibiotic

Interpretation
S = susceptible
I = intermediate
R = resistant

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How would you classify this case?

Antibiotic	Organism #1	
	<i>Klebsiella pneumoniae</i>	
	Susceptibility	MIC
Amp/Sul	Resistant (R)	>=32
Ceftazidime	R	>=64
Ertapenem	R	>1
Ceftriaxone	R	>=64
Ciprofloxacin	R	>=4
Gentamycin	R	>=16
Imipenem	-	-
Levofloxacin	R	>=8
Meropenem	R	4
Tobramycin	R	>=16

Enterobacterales
order resistant to

APPENDIX

Appendix 1 – List of genera in the Enterobacterales order¹

<i>Aceribabans</i>	<i>Enterobacillus</i>	<i>Kosakonia</i>	<i>Phytobacter</i>	<i>Scandinavium</i>
<i>Arsenophonus</i>	<i>Enterobacter</i>	<i>Leclercia</i>	<i>Plesiomonas</i>	<i>Serratia</i>
<i>Biostraticola</i>	<i>Erwinia</i>	<i>Lelliottia</i>	<i>Pluralibacter</i>	<i>Shigella</i>
<i>Brenneria</i>	<i>Escherichia</i>	<i>Leminorella</i>	<i>Pragia</i>	<i>Shimwellia</i>
<i>Buchnera</i>	<i>Ewingella</i>	<i>Limnobaculum</i>	<i>Proteus*</i>	<i>Siccibacter</i>
<i>Budvicia</i>	<i>Franconibacter</i>	<i>Lonsdalea</i>	<i>Providencia*</i>	<i>Sodalis</i>
<i>Buttiauxella</i>	<i>Gibbsiella</i>	<i>Mangrovibacter</i>	<i>Pseudoescherichia</i>	<i>Tatumella</i>
<i>Cedecea</i>	<i>Hafnia</i>	<i>Mixta</i>	<i>Pseudocitrobacter</i>	<i>Trabulsella</i>
<i>Chania</i>	<i>Insectihabans</i>	<i>Moellerella</i>	<i>Rahnella</i>	<i>Wigglesworthia</i>
<i>Chimaeribacter</i>	<i>Intestinirhabdus</i>	<i>Morganella*</i>	<i>Raoultella</i>	<i>Xenorhabdus</i>
<i>Citrobacter</i>	<i>Izhakiella</i>	<i>Obesumbacterium</i>	<i>Rosenbergiella</i>	<i>Yersinia</i>
<i>Coszenzoa</i>	<i>Jinshanibacter</i>	<i>Pantoea</i>	<i>Rouxiiella</i>	<i>Yokenella</i>
<i>Cronobacter</i>	<i>Kalmiella</i>	<i>Pectobacterium</i>	<i>Saccharobacter</i>	
<i>Dickeya</i>	<i>Klebsiella</i>	<i>Phaseolibacter</i>	<i>Salmonella</i>	
<i>Edwardsiella</i>	<i>Kluyvera</i>	<i>Photorhabdus</i>	<i>Samsonia</i>	

¹ Elevated MICs to imipenem in *Morganella* spp., *Proteus* spp., and *Providencia* spp. are frequently due to mechanisms other than carbapenemases. Please do NOT send isolates of these genera to OSPHL unless there is also resistance to other carbapenems.
²The most common CRE genera are highlighted



How would you classify this case?

Antibiotic	Organism #2	
	<i>Acinetobacter baumannii</i>	
	Susceptibility	MIC
Amp/Sul	Susceptible (S)	<8/4
Ceftazidime	R	>16
Ceftriaxone	R	>32
Ciprofloxacin	R	>2
Gentamycin	S	<4
Imipenem	I	4
Levofloxacin	R	>4
Meropenem	R	8
Tobramycin	S	<4

Acinetobacter
species resistant

APPENDIX

Appendix 1 – List of genera in the Enterobacterales order¹

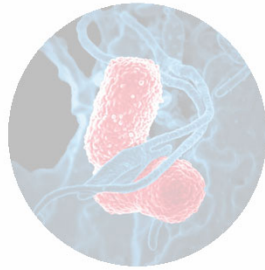
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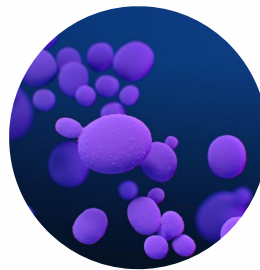
Two multidrug-resistant organisms of concern:

Carbapenemase-producing organisms (CPO)



Carbapenem-resistant *Klebsiella pneumoniae*
source: CDC

Candida auris



Candida auris
source: CDC

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Candida auris

- Fungus (yeast)
- Some strains resistant to all classes of available antifungals
- Very rare in Oregon
- Can cause serious illness, outbreaks – contact ACDP immediately

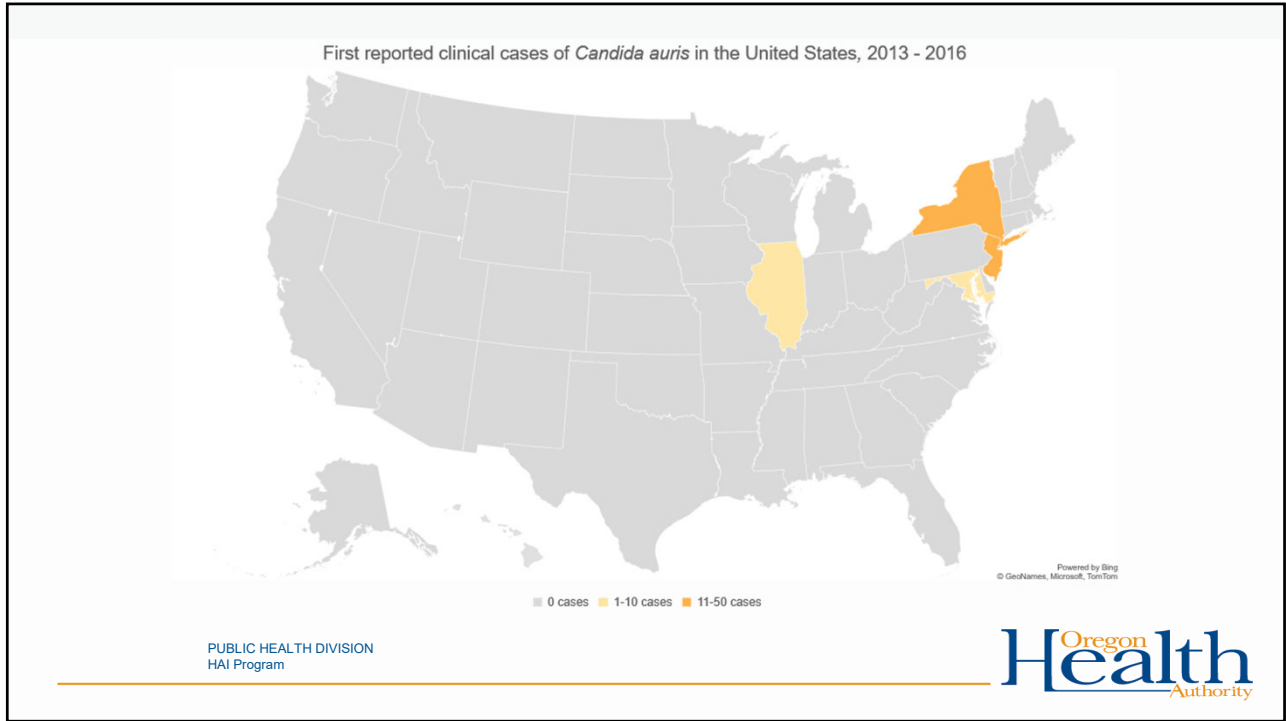


Candida auris
source: CDC

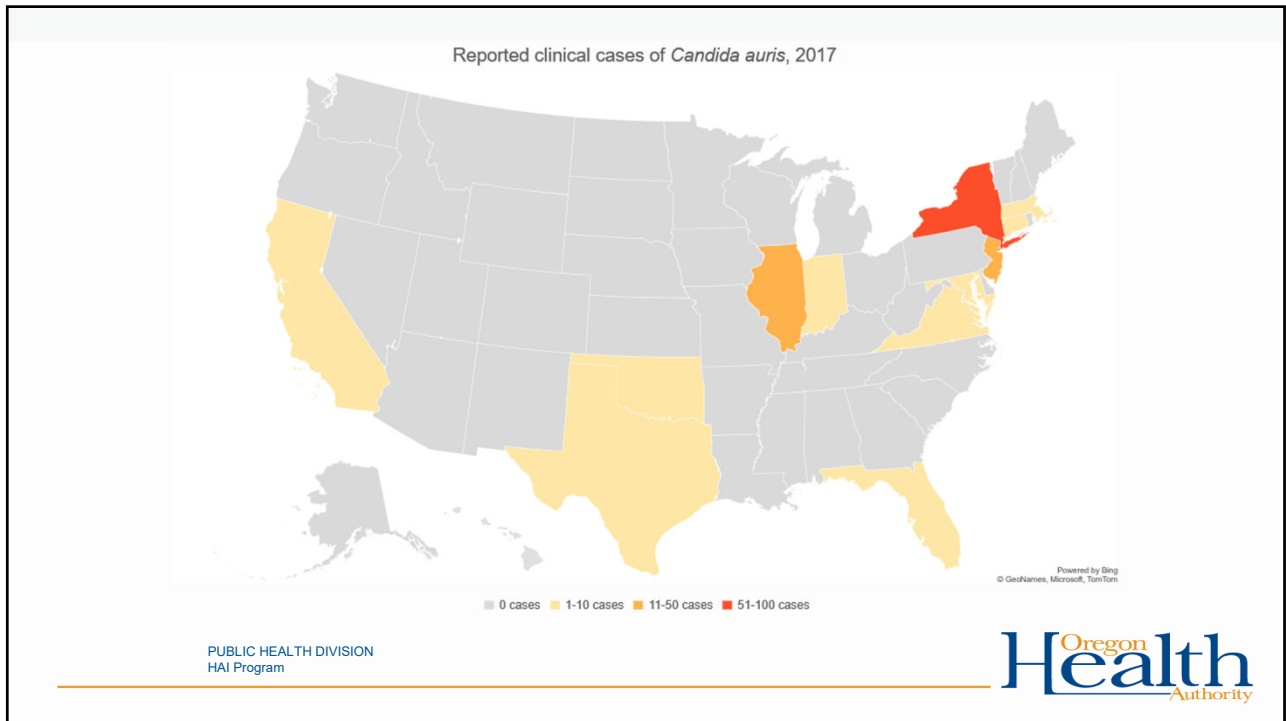
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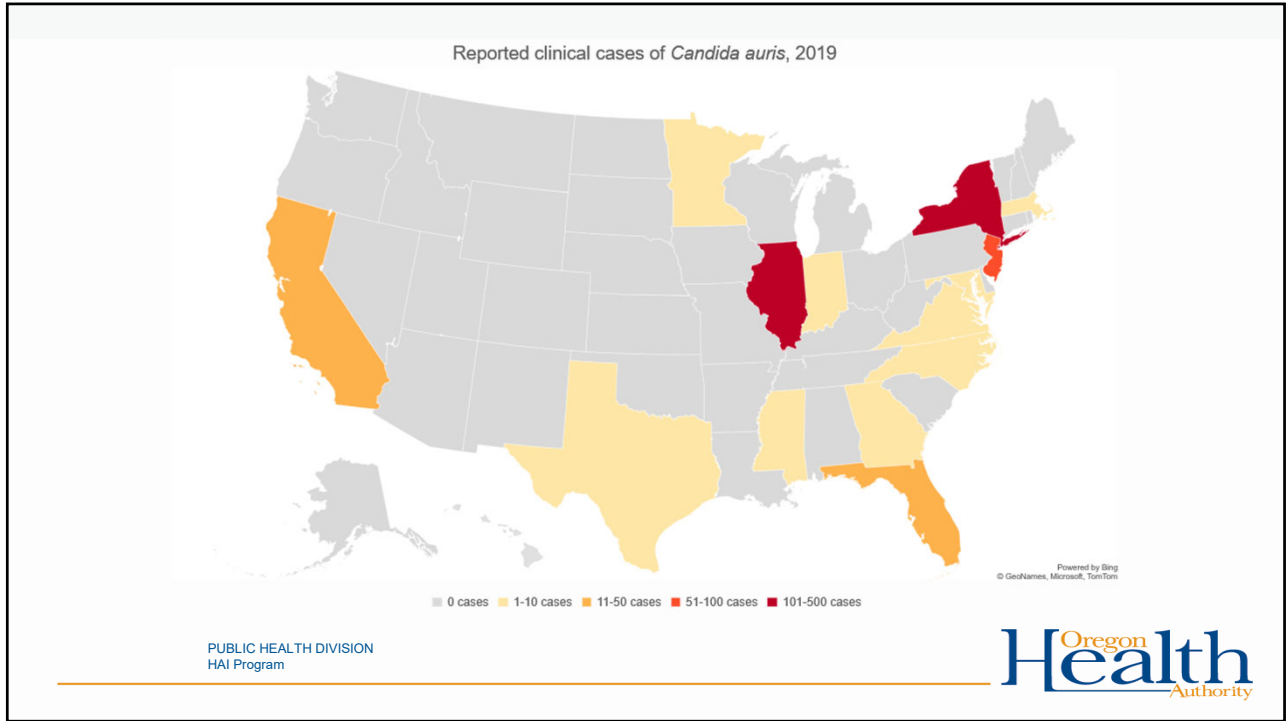
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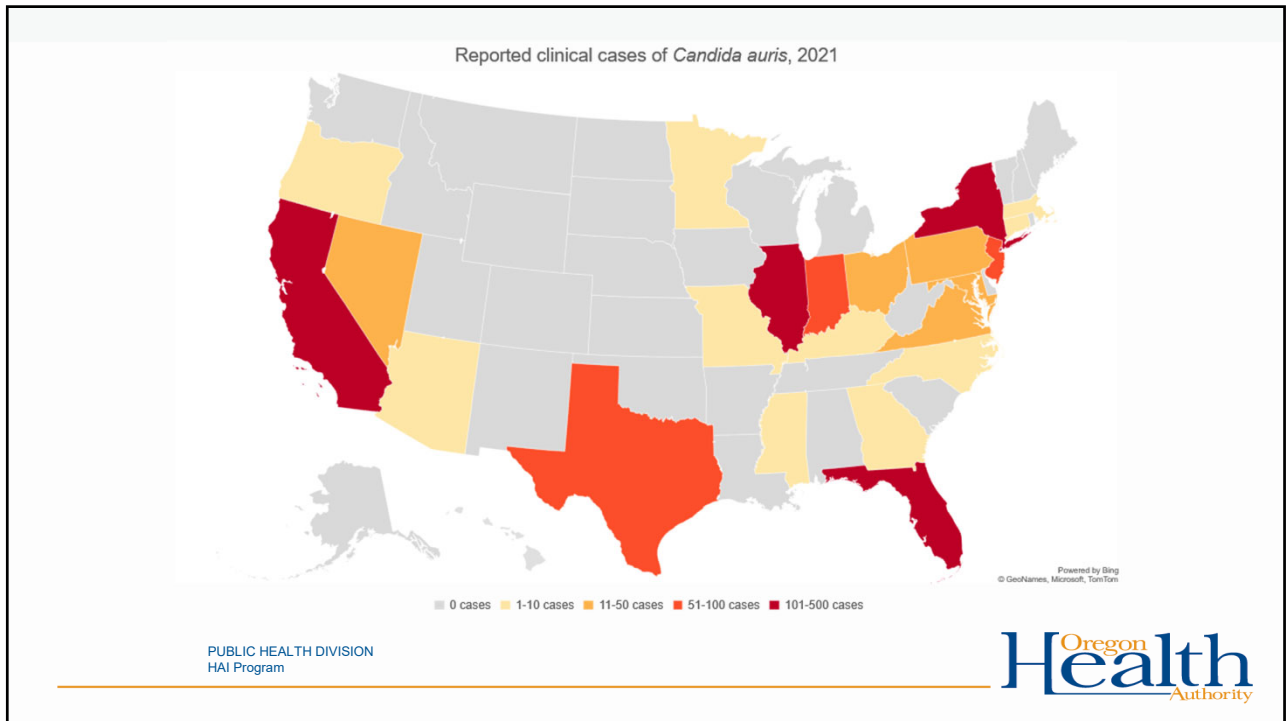
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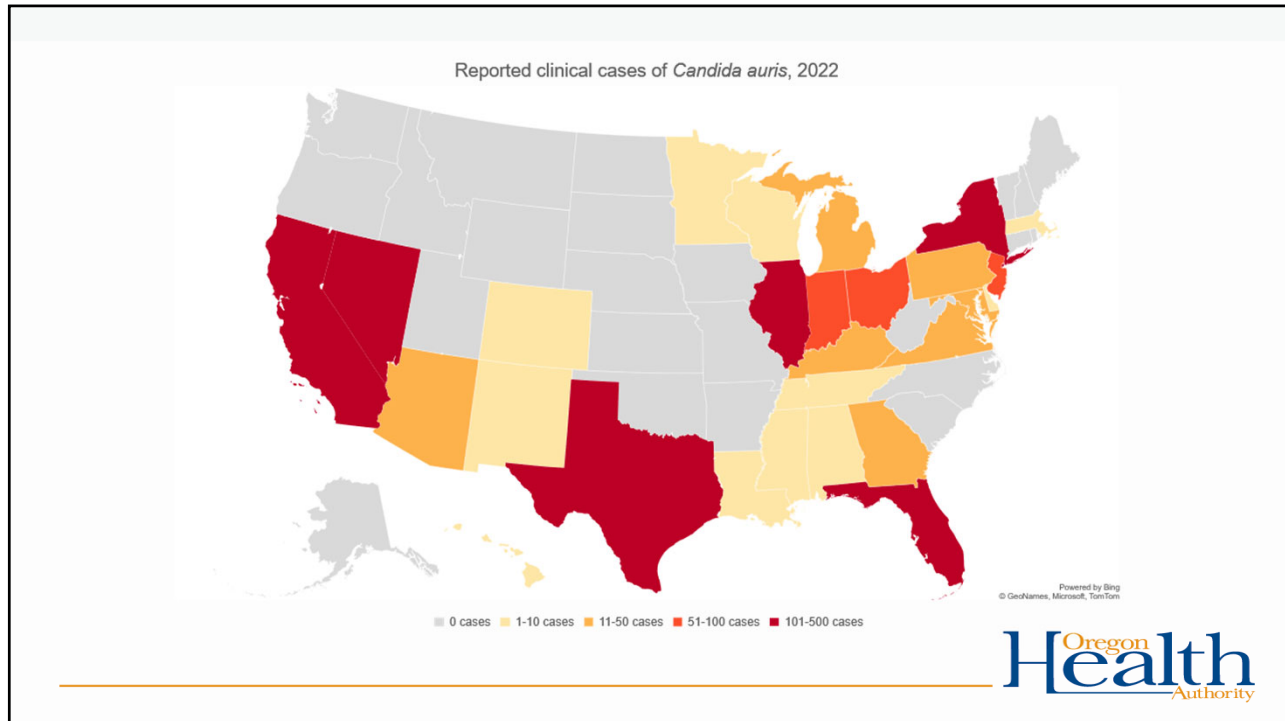
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3 cases of *C. auris* in Oregon made local and national news Dec. 2021

USA Today
Oregon hospital reports outbreak of rare superbug *Candida auris* ...
The risk of infection to otherwise healthy people is "extremely low." Since 2013, about 1,150 clinical cases of *Candida auris* have been...

KTVZ
Oregon reports first 3 cases of drug-resistant 'superbug' ...
Oregon reports first 3 cases of drug-resistant 'superbug' fungus *Candida auris* ...
PORTLAND, Ore. (KTVZ) – The Oregon Health Authority said late...

Gizmodo
Deadly Superbug Yeast Sickens Patients at Oregon Hospital
Dec 29, 2021 – Three people at the hospital have contracted the hardy fungus known as *Candida auris*, which is often resistant to multiple drugs.

FOX 5 New York
Oregon hospital reports rare, fungal outbreak
Health officials said the first-ever *Candida auris* case found in Oregon was detected at the hospital Dec. 11 and confirmed Dec.

Oregon Live
Oregon records 1st cases of rare, serious fungal infection *Candida auris* in 3 Salem patients
Since 2013, more than 1,150 clinical cases of *Candida auris* have been identified in the United States. No cases of the fungus identified in...

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Breaking News: *Candida auris* detected in Washington

Pierce County man believed to be first in state infected with potentially deadly fungus



By [Deedee Sun, KIRO 7 News](#)

July 19, 2023 at 12:49 pm PDT

Feb 6, 2024 - Health

What to know about Seattle's potentially deadly fungus outbreak

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Southern Nevada deemed a hotspot for 'superbug' fungus

SUPERBUG FUNGUS WARNING
CALLED CANDIDA AURIS

- Large ongoing outbreak in Nevada
 - As of Jan 22, 2024:
 - 1,021 clinical cases
 - 1,683 colonization/screening cases

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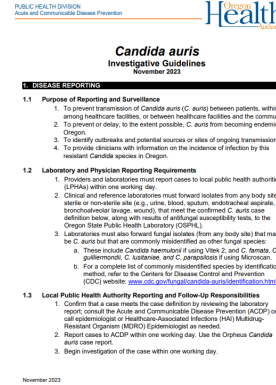
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Preventing and Responding to *C. auris*

- Newly created guidelines for *Candida auris*
- Case investigation will include HAI Program involvement



<https://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/COMMUNICABLE/DISEASE/REPORTING/COMMUNICABLE/DISEASE/REPORTINGGUIDELINES/Documents/Candida-auris.pdf>



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Candida auris

- Rare in Oregon
- Contact ACDP right away
- May spread rapidly
 - Require coordinated approach across public health and healthcare



Candida auris
source: CDC

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Oregon Public Health Division Resources

- ▶ Resources for Local Public Health Authorities
<https://www.oregon.gov/oha/PH/DiseasesConditions/CommunicableDisease/Pages/For-lhd.aspx>
- ▶ Communicable Disease Trainings and Toolkits
<https://www.oregon.gov/oha/PH/DISEASESCONDITIONS/COMMUNICABLEDISEASE/Pages/CD-Trainings-Toolkits.aspx>
- ▶ Communicable Disease Surveillance Data and Reports
<https://www.oregon.gov/oha/PH/DISEASESCONDITIONS/COMMUNICABLEDISEASE/DISEASESURVEILLANCEDATA/Pages/index.aspx>
- ▶ Subscribe to get the Weekly Flu Bites report: www.healthoregon.org/fludata
- ▶ Subscribe to get the CD Summary Reports: www.healthoregon.org/cdsummary
- ▶ Crisis and Emergency Risk Communication (CERC) Toolkits: www.healthoregon.org/cerc
- ▶ Oregon Public Health Division Youtube Channel: <https://www.youtube.com/user/healthoregon>

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**Please fill out your Post-Test
and
Please complete the Course Evaluation**

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