
**Infection Prevention
Fundamentals Part 2 and an
Introduction to MDRO
vSNF Workgroup
May 11, 2022**

Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health



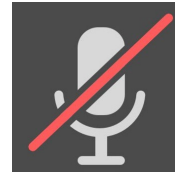
Housekeeping Reminders



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Agenda

12-12:05PM	Welcome
12:05-12:35PM	The Role of Personal Protective Equipment and Precautions in Infection Prevention
12:35-1:25PM	Introduction to MDRO
1:25-1:30PM	Next steps

Tools for Implementing a Quality Improvement Project

Tools for Implementing a Quality Improvement Project			
Institutional Support and Infrastructure	Training and Education	Reminders in the Workplace	Evaluation and Feedback
Gain leadership approvals for participation	Hand Hygiene		
	Slides/flipchart for healthcare worker education sessions Hand washing (video)	<i>My 5 Moments for Hand Hygiene</i> poster Hand hygiene technique posters: <i>How to Handrub</i> , <i>How to Handwash</i>	Observation tools: adherence monitoring Templates for sharing adherence monitoring data with staff and leadership
Participate and receive feedback from onsite assessments	Environmental Cleaning and Disinfection		
	Slides/flipchart for healthcare worker education sessions Principles of cleaning (video)	<i>CDC Cleaning Strategy (Clean to Dirty)</i> flyer <i>Who Cleans What?</i> Flyer (customize to your facility policy)	Observation tools: adherence monitoring, fluorescent marker tool Templates for sharing adherence monitoring data with staff and leadership
Pre-post evaluation (distributed at workshops)			Environmental cleaning and disinfection responsibility assessment tool

Training and Education: Staff Training Slides / Flipchart



Environmental Cleaning and Disinfection



Personal Protective Equipment and Precautions Staff Training



PERSONAL PROTECTIVE EQUIPMENT (PPE) AND PRECAUTIONS

Objectives

- Review recommended personal protective equipment (PPE)
- Demonstrate safe donning and doffing sequences
- Explain fit-testing for N95 respirators

Key Points for Donning and Doffing PPE

- Don before contact with the patient, ideally just before entering the room
- Use carefully – avoid contamination
- Remove and discard carefully, either at the doorway or immediately outside patient room; remove respirator outside room
- Immediately perform hand hygiene

Sequence for Donning PPE

Perform hand hygiene before donning PPE.

1. Gown first
2. Mask or respirator
3. Goggles or face shield
4. Gloves

How to Don a Gown

- Select appropriate type and size
- Opening is in the back
- Secure at neck and waist
- If gown is too small, use two gowns
 - Gown #1 ties in front
 - Gown #2 ties in back



How to Don a Mask

- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with ties or elastic
- Adjust to fit



How to Don a Respirator

- Select a fit tested respirator, preferably
- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with elastic
- Adjust to fit
- Perform a fit check:
 - Inhale – respirator should collapse
 - Exhale – check for leakage around face



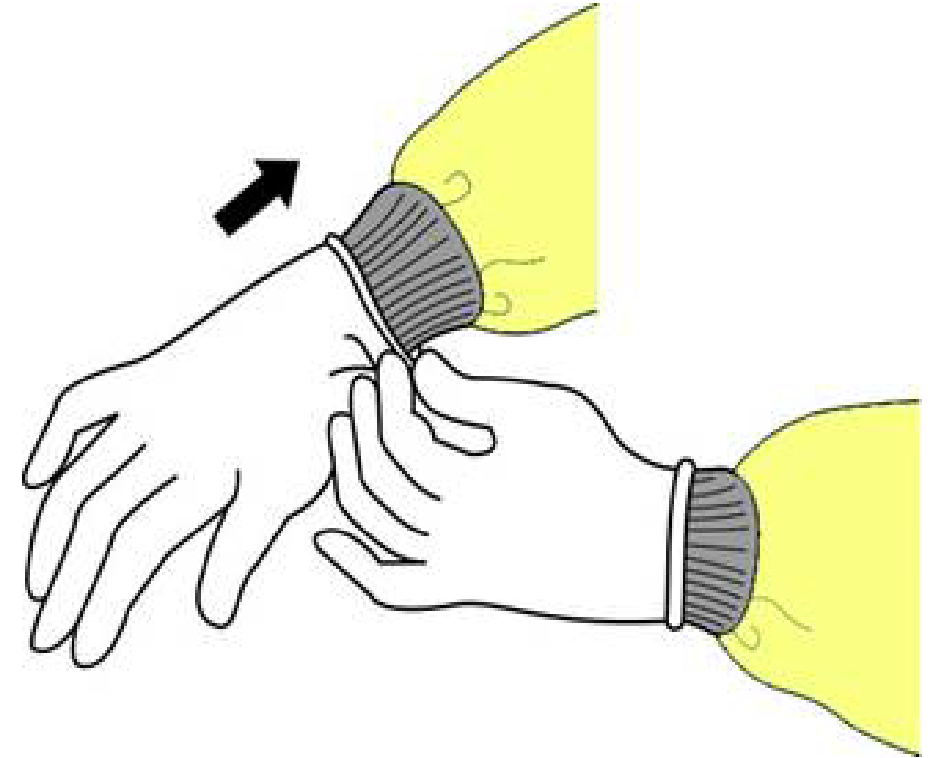
How to Don Eye and Face Protection

- Position goggles over eyes and secure to the head using the ear pieces or headband
- Position face shield over face and secure on brow with headband
- Adjust to fit comfortably



How to Don Gloves

- Don gloves last
- Select correct type and size
- Insert hands into gloves
- Extend gloves over isolation gown cuffs



Use Safe PPE Practices

- Keep gloved hands away from face
- Avoid touching or adjusting other PPE
- Remove gloves if they become torn; perform hand hygiene before donning new gloves
- Limit surfaces and items touched



Sequence for Removing PPE

1. Remove gloves*
 - Perform hand hygiene
2. Remove gown*
 - Perform hand hygiene
3. Remove face shield/ goggles
 - Perform hand hygiene
4. Remove mask or respirator
 - Perform hand hygiene

* Gown and gloves may be removed together.

Remove PPE in Appropriate Areas

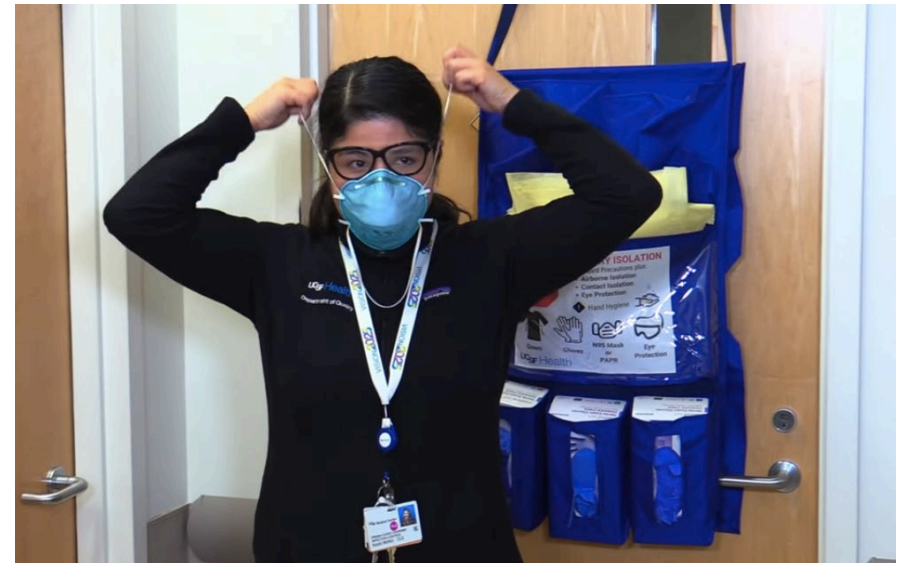
- At doorway, before leaving patient room or in anteroom
- Remove respirator outside room, after door has been closed*



*Ensure hand hygiene supplies are available at the points needed, either a sink or alcohol-based hand rub

[UCSF Health Donning and Doffing PPE](https://www.youtube.com/watch?v=-sBNxli21n0&feature=emb_title)

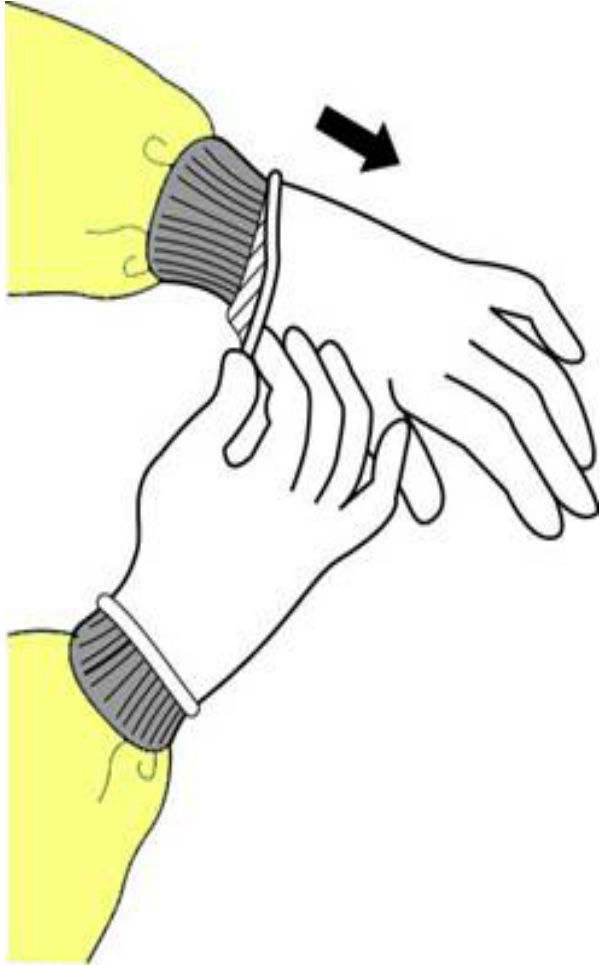
([www.youtube.com/watch?v=-sBNxli21n0&feature=emb title](https://www.youtube.com/watch?v=-sBNxli21n0&feature=emb_title))



Recognize the “Contaminated” and “Clean” areas of PPE

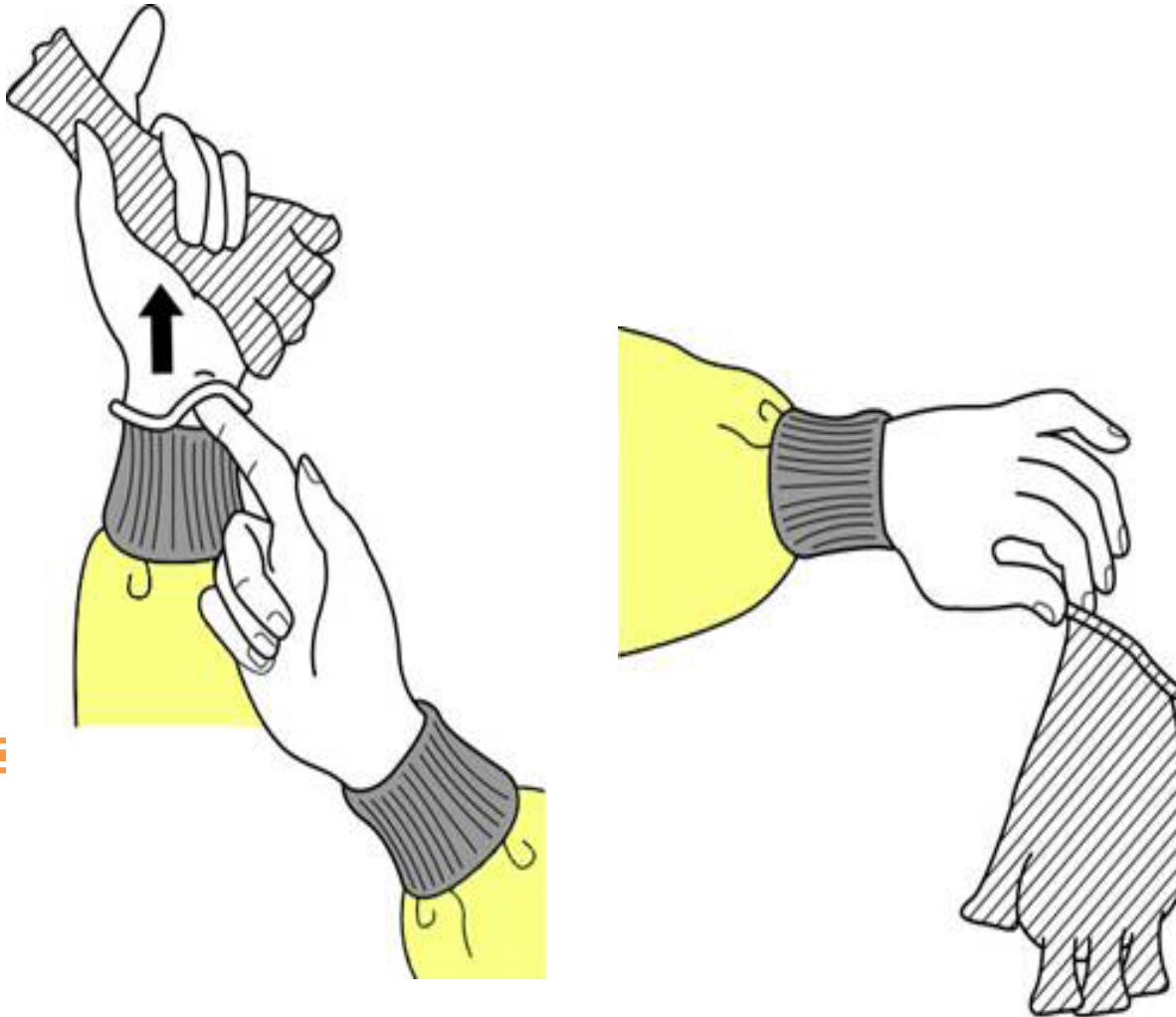
- Contaminated
 - PPE areas likely to have been in contact with body sites, materials, or surfaces with infectious organisms
 - Includes the outside and front of PPE
 - Clean
 - PPE areas that are not likely to have been in contact with the infectious organism
 - Includes the inside and the outside back of PPE
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How to Remove Gloves (Method 1)



- **Step 1:** Grasp outside edge near wrist
- **Step 2:** Peel away from hand, turning glove inside-out
- **Step 3:** Hold in opposite gloved hand

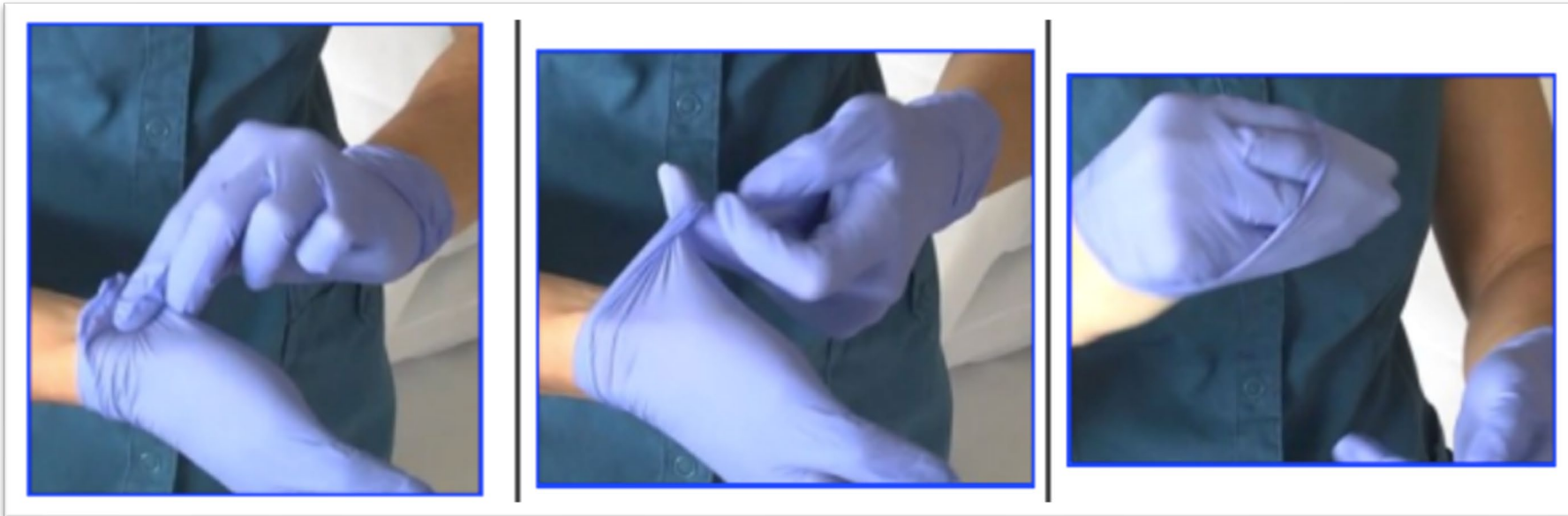
How to Remove Gloves (Method 1), continued



- **Step 4:** Slide ungloved finger under the wrist of the remaining glove
- **Step 5:** Peel off from inside, creating a bag for both gloves
- **Step 6:** Discard

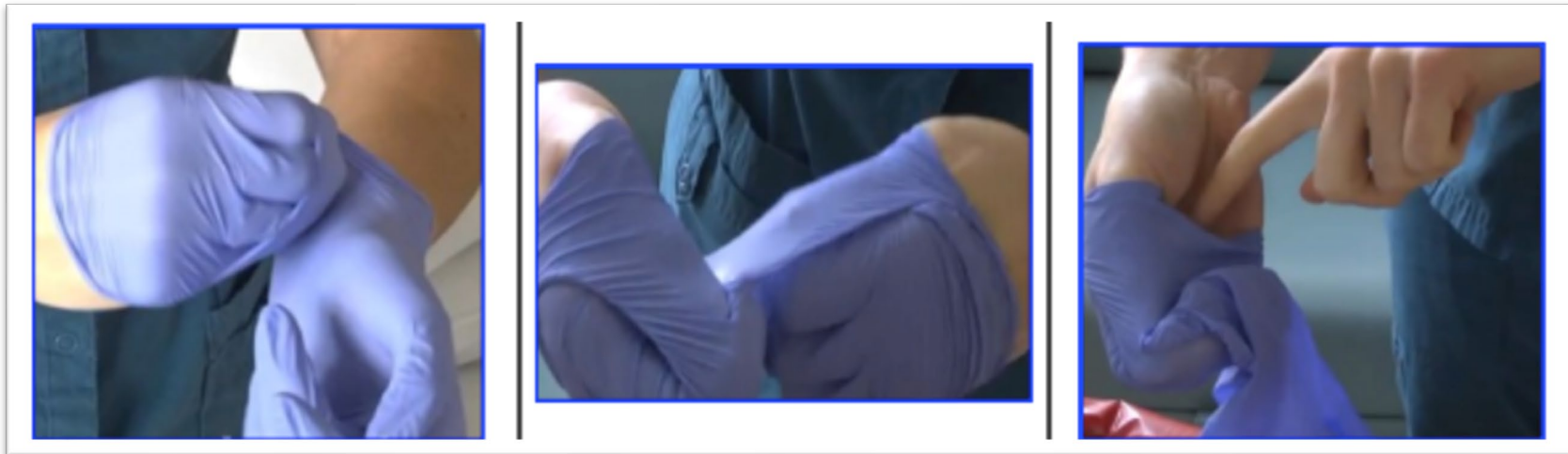
How to Remove Gloves (Method 2 - Beak)

- **Step 1:** Using one gloved hand, pinch and pull the base of the other gloved hand.
- **Step 2:** Use the middle finger to scoop the cuff of the glove.
- **Step 3:** Pull the glove inside out over all the fingers and thumb to form a “beak”



How to Remove Gloves (Method 2 - Beak), continued

- **Step 4:** With the beaked hand, pinch the opposite glove at the base and pull the cuff.
- **Step 5:** Roll the glove inside out and off the hand.
- **Step 6:** With the ungloved hand, use the index finger to pull the beaked glove off at the base of the beak and dispose into the appropriate waste container.



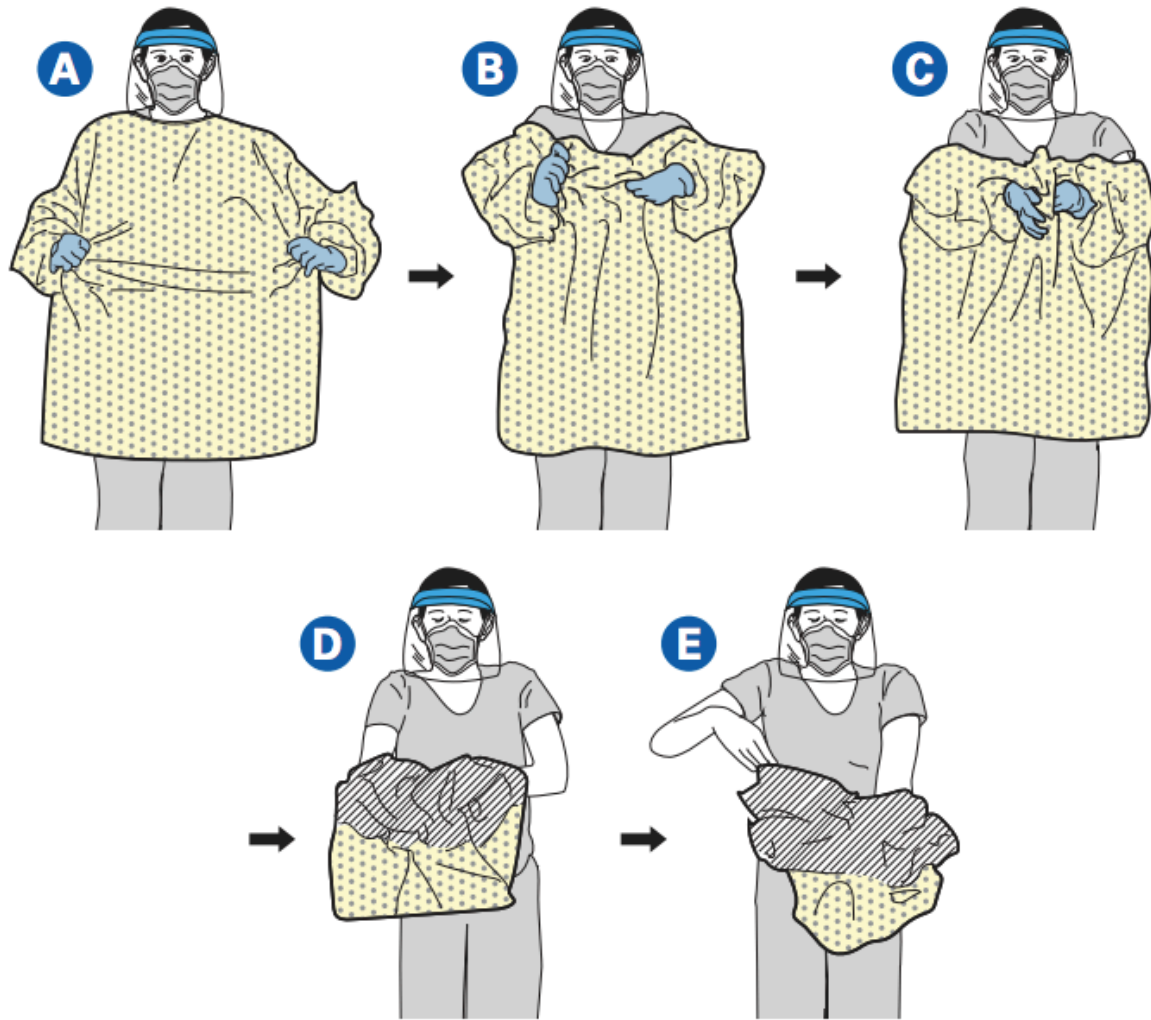
Always perform hand hygiene after glove removal.

How to Remove Isolation Gown



- Unfasten ties
- Peel gown away from neck and shoulder
- Turn contaminated outside toward the inside
- Fold or roll into a bundle
- Discard
- Perform hand hygiene

How to Remove Gown and Gloves Together



- With gloved hands, grasp gown in front
- Pull gown away from body so ties break
- Fold or roll into a bundle; peel off gloves at same time
- Discard
- Perform hand hygiene

How to Remove Goggles or Face Shield



- Grasp ear or head pieces with unglved hands
- Lift away from face
- Place in designated receptacle for reprocessing or disposal



How to Remove a Respirator

- Remove outside the room or in the ante-room
- Lift the bottom elastic over your head first
- Then lift off the top elastic
- Discard

[CDC PPE Sequence](#) (PDF)

(www.cdc.gov/hai/pdfs/ppe/PPE-Sequence.pdf)



How to Remove a Tied Facemask



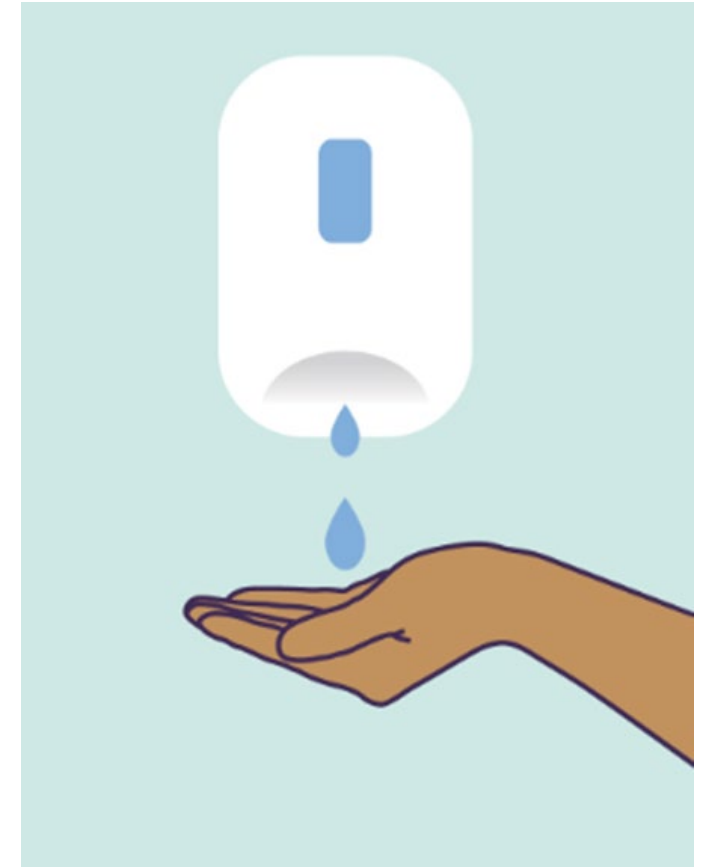
- Remove at least 6 feet away from the patient, e.g. at the door
- Untie the bottom, then top, tie
- Remove from face
- Discard



Perform Hand Hygiene After All PPE Removed

- Perform hand hygiene immediately after removing PPE and preferably after each step
- Use alcohol-based hand rub or wash with soap and water

Exception: If hands become visibly contaminated during PPE removal, wash hands with soap and water before continuing PPE removal



Respirator and Fit Testing

- Ensure designated HCP are fit tested to the N95 respirator available in the SNF; can be within the past year
 - Conduct fit testing using [OSHA-accepted fit test methods](http://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134AppA)
(www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134AppA)
 - Fit-testing is one aspect of a respiratory protection program
 - CAL/OSHA will provide guidance for SNF to meet regulatory requirements
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Adherence Monitoring Tool: Contact Precautions



Healthcare-Associated Infections Program Adherence Monitoring Contact Precautions

Assessment completed by:
Date:
Unit:

Regular monitoring with feedback of results to staff can maintain or improve adherence to contact precautions practices. Use this tool to identify gaps and opportunities for improvement. Monitoring may be performed in any type of patient care location where patients are on contact precautions.

Instructions: Observe 3-4 patients/residents on contact precautions. Observe each practice and check a box if adherent, Yes or No. In the column on the right, record the total number of "Yes" for adherent practices observed and the total number of observations ("Yes" + "No"). Calculate adherence percentage in the last row.

Contact Precautions Practices	Contact Precautions Patient/Resident 1	Contact Precautions Patient/Resident 2	Contact Precautions Patient/Resident 3	Contact Precautions Patient/Resident 4	Adherence by Task	
					# Yes	# Observed
CP1. Gloves and gowns are available and located near point of use.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
CP2. Signs indicating the patient/resident is on contact precautions are clear and visible.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
CP3. The patient/resident on contact precautions is housed in single-room or cohorted based on a clinical risk assessment.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
CP4. Hand hygiene is performed before entering the patient/resident care environment.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
CP5. Gloves and gowns are donned before entering the patient/resident care environment.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
CP6. Gloves and gowns are removed and discarded, and hand hygiene is performed before leaving the patient/resident care environment. <i>Soap & water is used if it is hospital policy or if the patient/resident has C.difficile infection.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
CP7. Dedicated or disposable noncritical patient-care equipment (e.g. blood pressure cuffs) is used; if dedicated/disposable equipment is unavailable, then equipment is cleaned and disinfected prior to use on another patient/resident according to manufacturers' instructions.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

of Correct Practices Observed ("# Yes"): _____

Total # Contact Precautions Observations ("# Observed"): _____
(Up to 28 total)

Adherence _____%
(Total "# Yes" ÷ Total "# Observed" x 100)

If practice could not be observed (i.e. cell is blank), do not count in total # Observed.

Summary

- Select and use the appropriate PPEs as required
- Educate all HCWs on donning and doffing process of personal protective equipment (PPE).
- This process should be done in a safe manner to avoid self and cross contamination.
- Perform hand hygiene before donning and after each step of PPE removal

Resources

- [Donning and Doffing PPE \(UCSF Health\)](https://www.youtube.com/watch?v=-sBNxli21n0&feature=emb_title)
(www.youtube.com/watch?v=-sBNxli21n0&feature=emb_title)



Introduction to Antimicrobial Resistance and Multidrug-Resistant Organisms

May 11, 2022

Presented via Webinar

Ventilator-Equipped Skilled Nursing Facility Workgroup to Prevent Multidrug-Resistant Organisms

Diana Holden, MPH
Healthcare-Associated Infections (HAI) Program
Center for Health Care Quality
California Department of Public Health

Objectives

- Describe antimicrobial resistance (AR) and five characteristics of multidrug-resistant organisms (MDRO), and their clinical importance
- Discuss the epidemiology of *Candida auris* and carbapenemase-producing organisms (CPO), and present two regional outbreaks of MDRO in California
- Present five facility-based surveillance, investigation, and infection prevention and control strategies

Antimicrobial Resistance (AR)

- Antibiotics and antifungal drugs = antimicrobial
 - Treat infections caused by bacteria and fungi
- Bacteria and fungi can develop resistant to antimicrobials → antimicrobial resistance
- CDC AR Threats Reports
 - **2.8 million** AR infections per year
 - **35,000** AR-related deaths per year

Multidrug-resistant Organisms (MDRO)

- **MDRO**
 - Bacteria or fungi that are resistant to many types of antimicrobial drugs
 - Infections caused by MDRO can be difficult to treat and lead to high mortality
- Examples
 - *Candida auris*
 - Carbapenem-resistant Enterobacterales (CRE)

MDRO Risk Factors

- Indwelling medical devices
 - e.g., urinary catheter, endotracheal tube
- Mechanical ventilation
- Wounds
- Recent antimicrobial use
- Frequent exposure to healthcare facilities
 - **Especially ventilator units in skilled nursing facilities (vSNF) and long-term acute care hospitals (LTACH)**

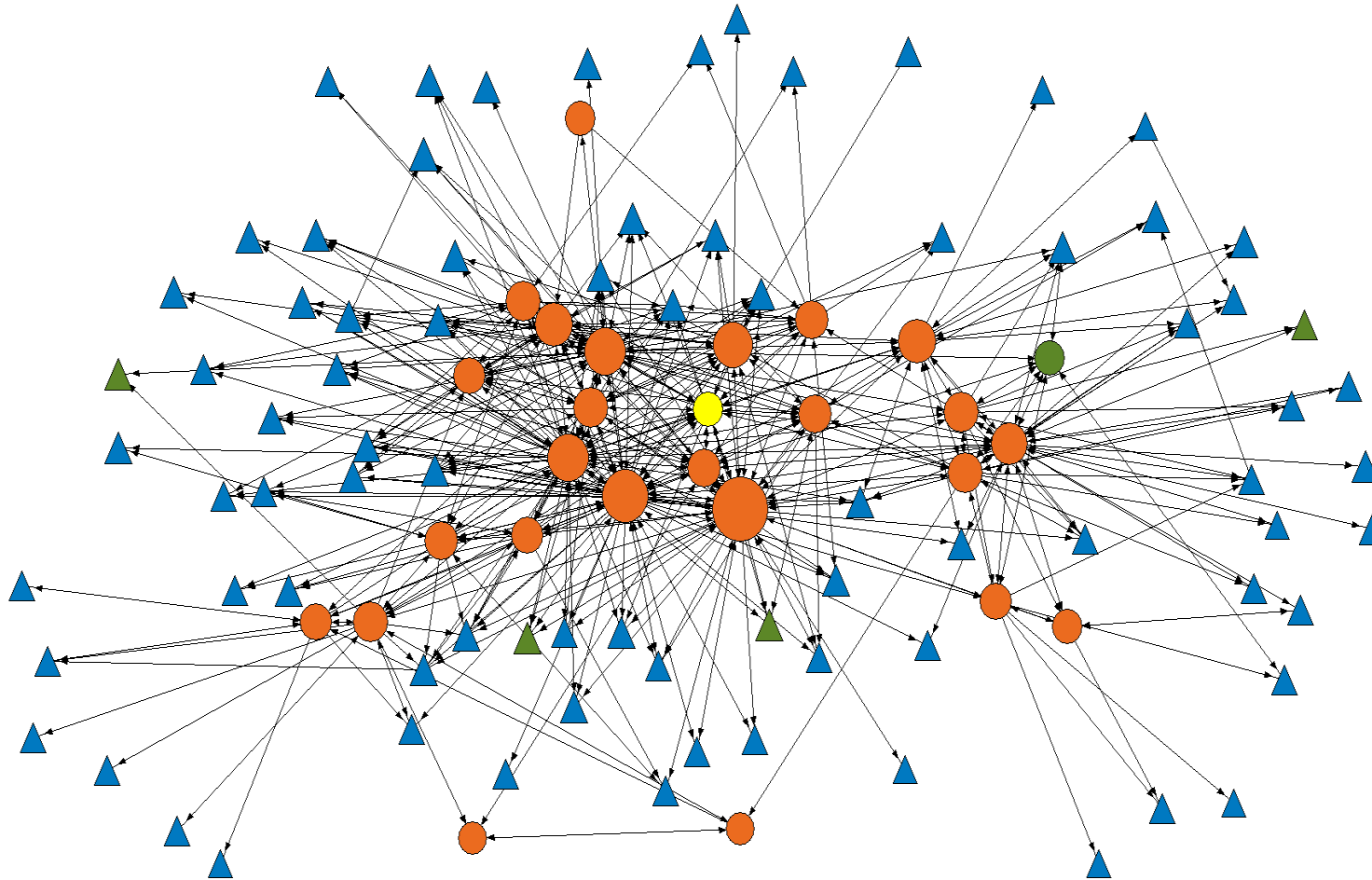
MDRO Colonization

- **Colonization** happens when a resident is carrying a germ but is not showing signs or symptoms of infection
- Residents colonized with MDRO can **still transmit the germ** to other residents
 - Silent transmission
- Residents can be colonized for many months or even years
 - **There is no formal “clearance” process**
 - Residents may be intermittently colonized
- Colonized residents can also go on to **develop clinical infections**

MDRO Cause Outbreaks

- Causes **outbreaks in vSNF**
- Sources of transmission include:
 - infected and colonized patients
 - shared medical equipment
 - healthcare workers (not typically colonized/infected)
 - healthcare environment surfaces
- Early and aggressive containment efforts can limit spread
 - We don't want these pathogens to become common in healthcare facilities

Patient Sharing Networks Lead to MDRO Spread



- General Acute Care Hospital
- Long Term Acute Care Hospital
- Distinct Part Subacute
- ▲ Skilled Nursing Facility
- ▲ Freestanding Subacute

- Can spread easily **within and between** healthcare facilities

Healthcare-associated MDRO*: What We Know

	<i>C. auris</i>	CRAB	Other MDRO (e.g., CRE, CRPA)	<i>C. diff</i>
Causes outbreaks in healthcare settings	X	X	X	X
Leads to substantial morbidity and mortality	X	X	X	X
Risk factors include frequent or extended healthcare exposure, antimicrobial use	X	X	X	X
Patients can remain colonized for many months (no “clearance” recommendations)	X	X	X	X
Persistent in the healthcare environment	X	X		X
Difficult to identify	X			

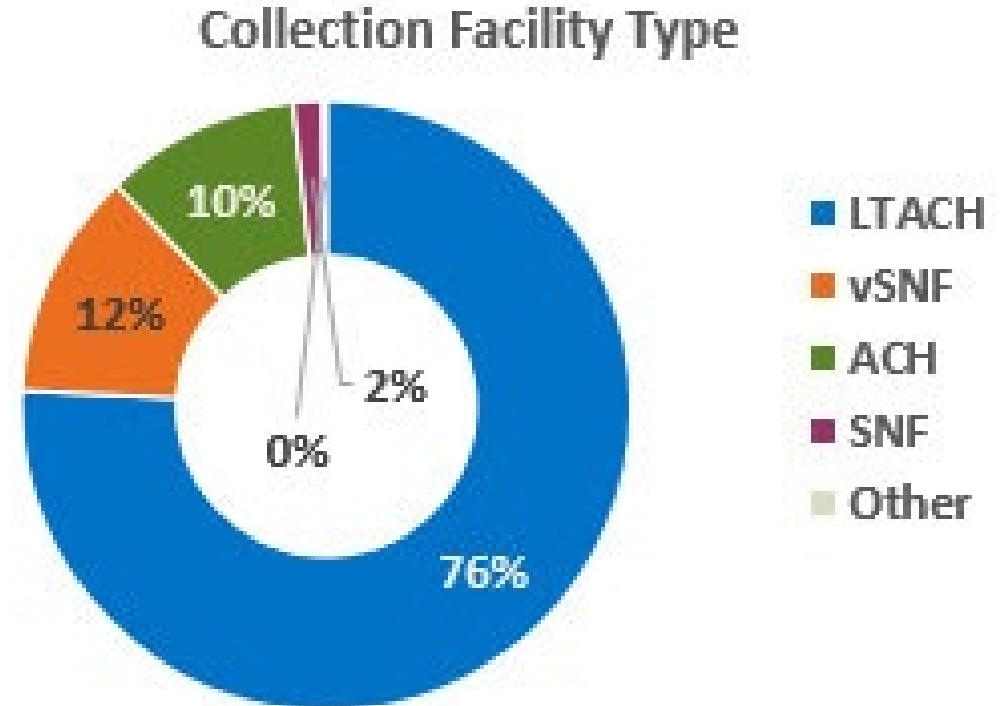
*Including *Clostridioides difficile* (*C. diff*); *C. auris*=*Candida auris*; CRAB = carbapenem-resistant *Acinetobacter*; CRE = carbapenem-resistant Enterobacterales; CRPA = carbapenem-resistant *Pseudomonas aeruginosa*; MDRO=multidrug-resistant organism

CANDIDA AURIS

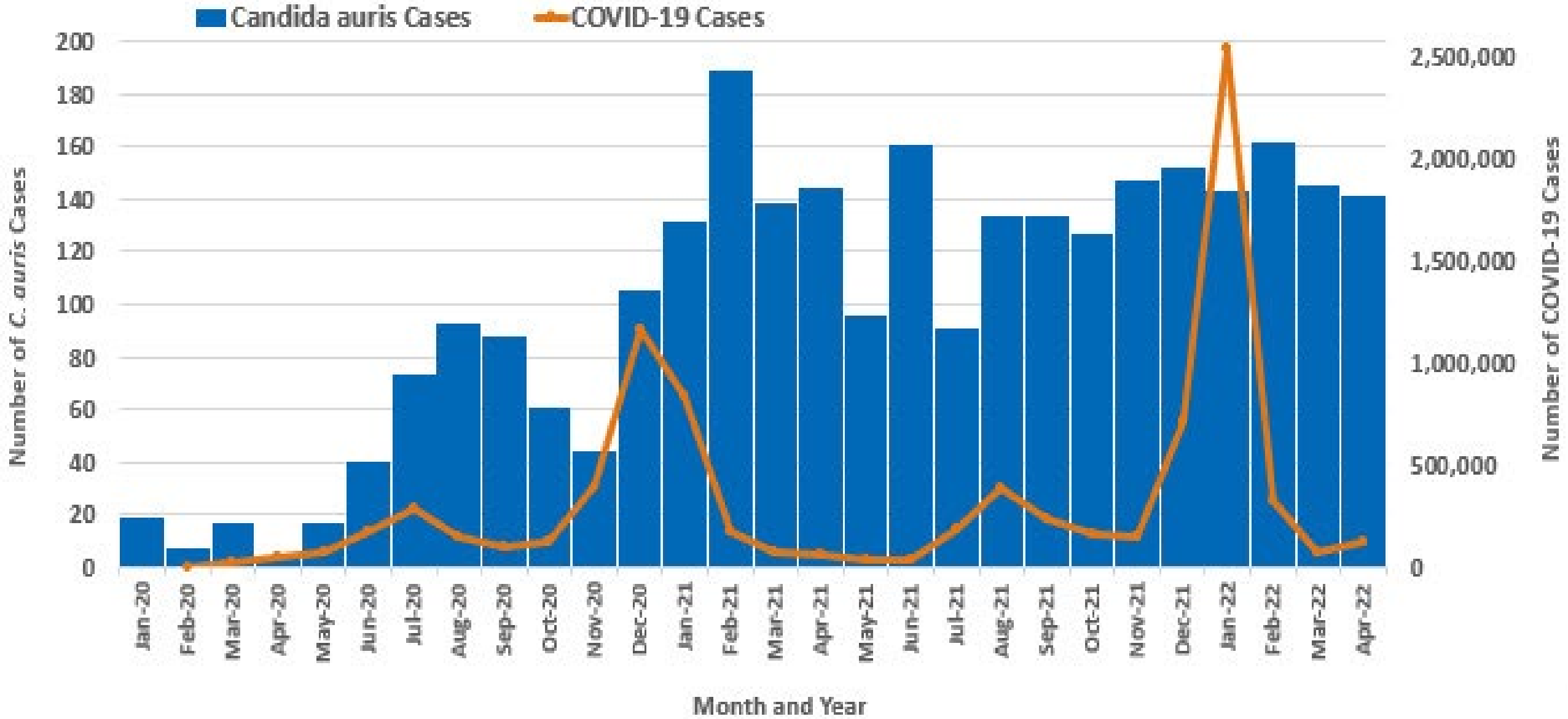


Candida auris

- Multidrug-resistant yeast
 - Few treatment options
- Can cause serious, invasive infections with **30-60% mortality**
- *C. auris* is very “sticky” in the healthcare environment
 - Cleaning and disinfection requires agents effective against *C. auris* (List P)
- Has caused **large regional outbreaks** in healthcare facilities

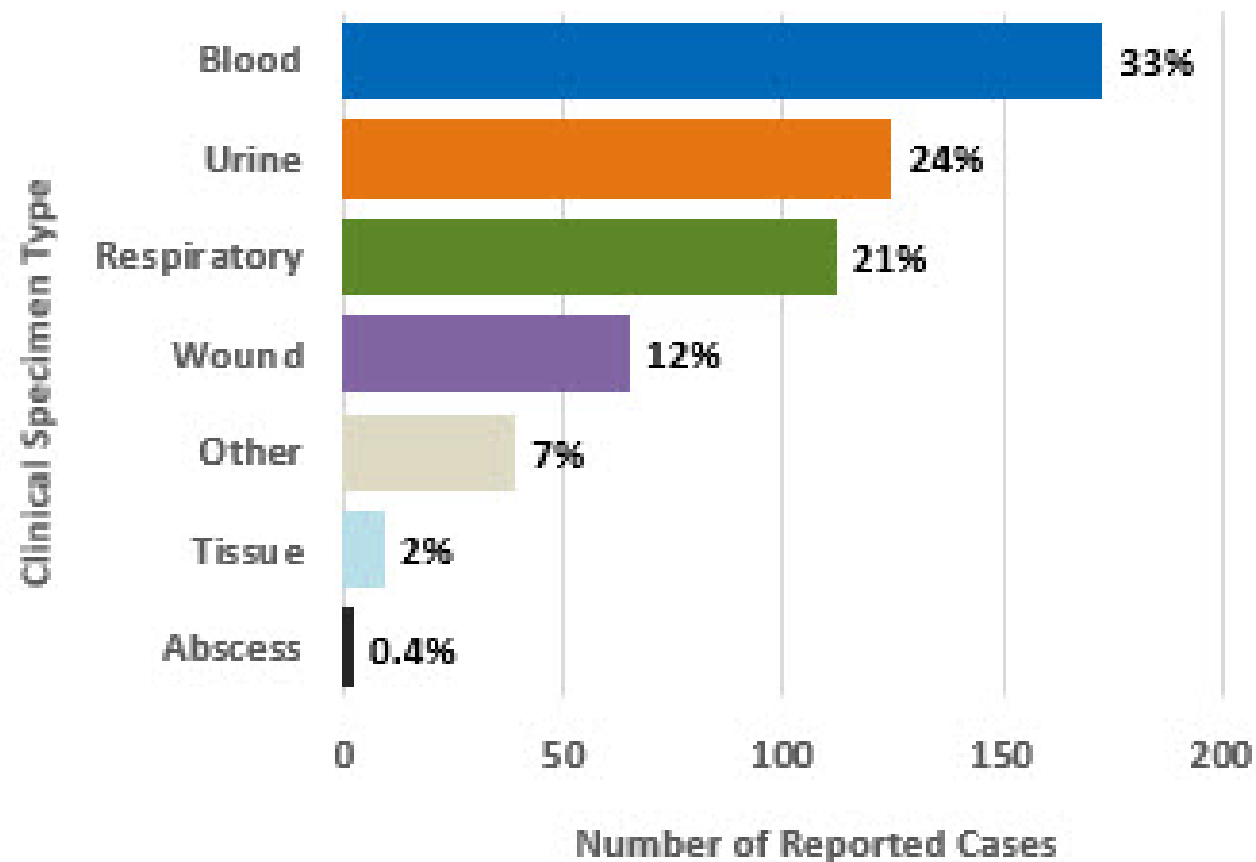
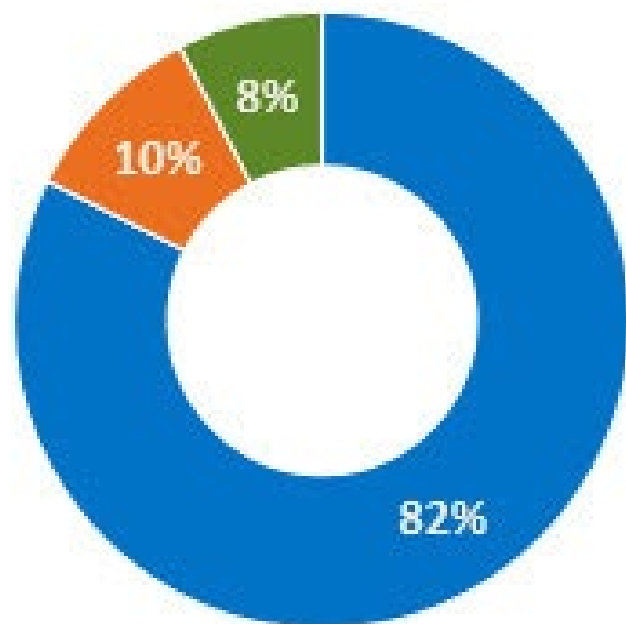


C. auris and COVID-19 Cases in CA 1/1/20 – 4/30/22



C. auris Cases by Case Type, Clinical Specimen Type

■ Screening ■ Screening then Clinical ■ Clinical



CARBAPENEM-RESISTANT ORGANISMS (CRO)

Acronyms

- **CRO**
 - CRE
 - CRPA
 - CRAB

C is for Carbapenem

- Carbapenems are a type of antibiotic
- Broad spectrum, “last resort”
 - Doripenem
 - Ertapenem
 - Imipenem
 - Meropenem

R is for Resistant

- Resistant to at least 1 **carbapenem** antibiotic
- Treatment options for infections are limited, more expensive, more toxic, less effective

Selected Organism: *Acinetobacter baumannii* complex

Susceptibility Information	Card:		Status: Final			Analysis Time: 7.30 hours		
	Completed:		Antimicrobial	MIC	Interpretation	Antimicrobial	MIC	Interpretation
			Meropenem	>= 16	R			
			Amikacin					
			Gentamicin	>= 16	R			
			Tobramycin	>= 16	R			
			Ciprofloxacin	>= 4	R			
			Levofloxacin	>= 8	R			
			Tetracycline	>= 16	R			
			Nitrofurantoin					
			Trimethoprim/Sulfamethoxazole	>= 320	R			

+ = Deduced drug * = AES modified ** = User modified

O is for Organism

- **CRO = Carbapenem-resistant organism**
 - Gram-negative bacteria
 - **Enterobacterales (formerly Enterobacteriaceae)(CRE)**
 - *E. coli*
 - *Klebsiella pneumoniae*
 - *Enterobacter cloacae*
 - ***Pseudomonas aeruginosa* (CRPA)**
 - ***Acinetobacter baumannii* (CRAB)**
-
-

Carbapenem-resistant Enterobacterales (CRE)

- Includes commonly identified organisms:
 - *Klebsiella pneumoniae*
 - *E. coli*
 - *Enterobacter* species
- Naturally inhabit the gut
- Cause infections in wounds, bloodstream, urinary tract, pneumonia, and other sites



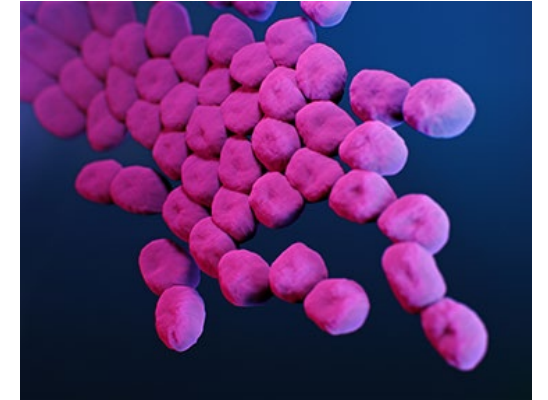
Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)

- CRPA tend to be found in the environment, particularly water sources
- CRPA are naturally resistant to many antibiotics, some pan-resistant
- CRPA can cause serious infections in patients with chronic lung disease



Carbapenem-resistant *Acinetobacter baumannii* (CRAB)

- CRAB are often found in the environment, particularly soil and water.
- Naturally resistant to many antibiotics, some pan-resistant
- CRAB can cause infections in blood, wound, urinary and respiratory tract, other sites.
- CRAB can be persistent in the healthcare environment
 - Outbreaks of CRAB are often associated with environmental, healthcare worker contamination



CRE, CRPA, and CRAB Comparison

	CRE	CRPA	CRAB
Common clinical specimen source	GI tract	Respiratory secretions, urine, wounds	
Screening specimen	Rectal	Rectal, respiratory, wound	Skin, rectal, respiratory, wound

CRE=Enterbacterales; CRPA=*Pseudomonas aeruginosa*; CRAB=*Acinetobacter baumannii*

[CDPH Carbapenem-Resistant Organisms Quicksheet](#) (PDF)

(www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CRO_Quicksheet_Oct2020.pdf)

CARBAPENEMASE-PRODUCING ORGANISMS (CPO)

Acronyms

- CRO
 - CRE
 - CRPA
 - CRAB
- CPO
 - CP-CRE
 - CP-CRPA
 - CP-CRAB

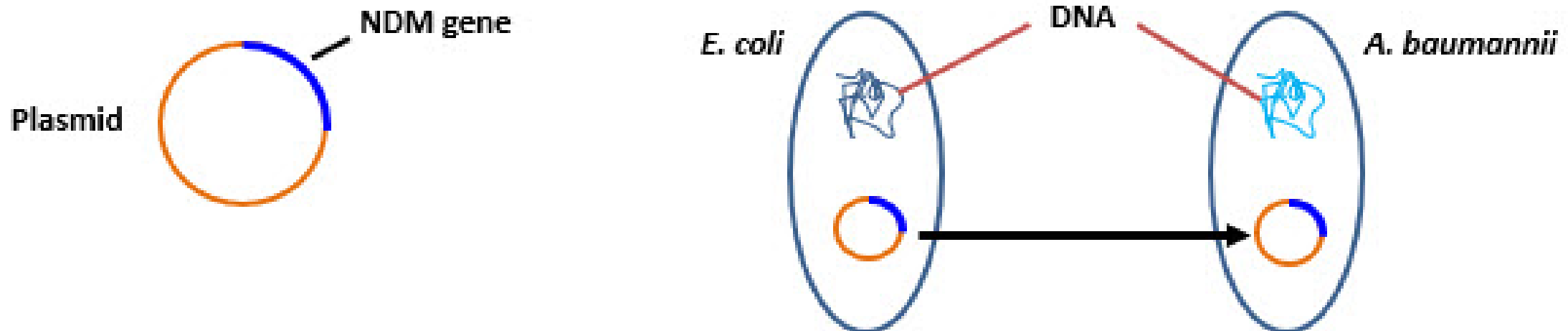
C is for Carbapenemase

- Carbapenemases are enzymes → confers resistance
 - Inactivates **carbapenem and related antibiotics**
 - Multidrug-resistant organism (MDRO)
- Examples include:
 - KPC, NDM, VIM, OXA, and IMP

KPC=Klebsiella pneumoniae carbapenemase; NDM=New Delhi Metallo- β -Lactamase; OXA=Oxacillinase,
VIM=Verona Integron Metallo- β -Lactamase; IMP= Imipenemase; OXA= Oxacillinase

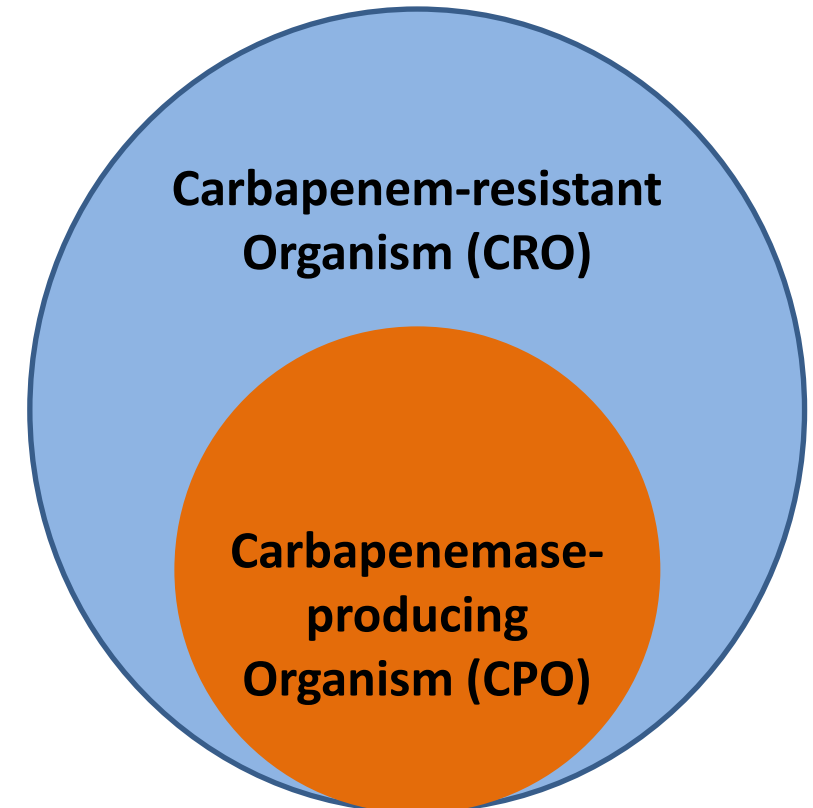
P is for Producing

- The organism **produces** the carbapenemase enzyme
- Carbapenemase genes can transfer within and across bacterial species
 - **More likely to spread resistance**
 - NDM-*E. coli* → NDM-*A. baumannii*



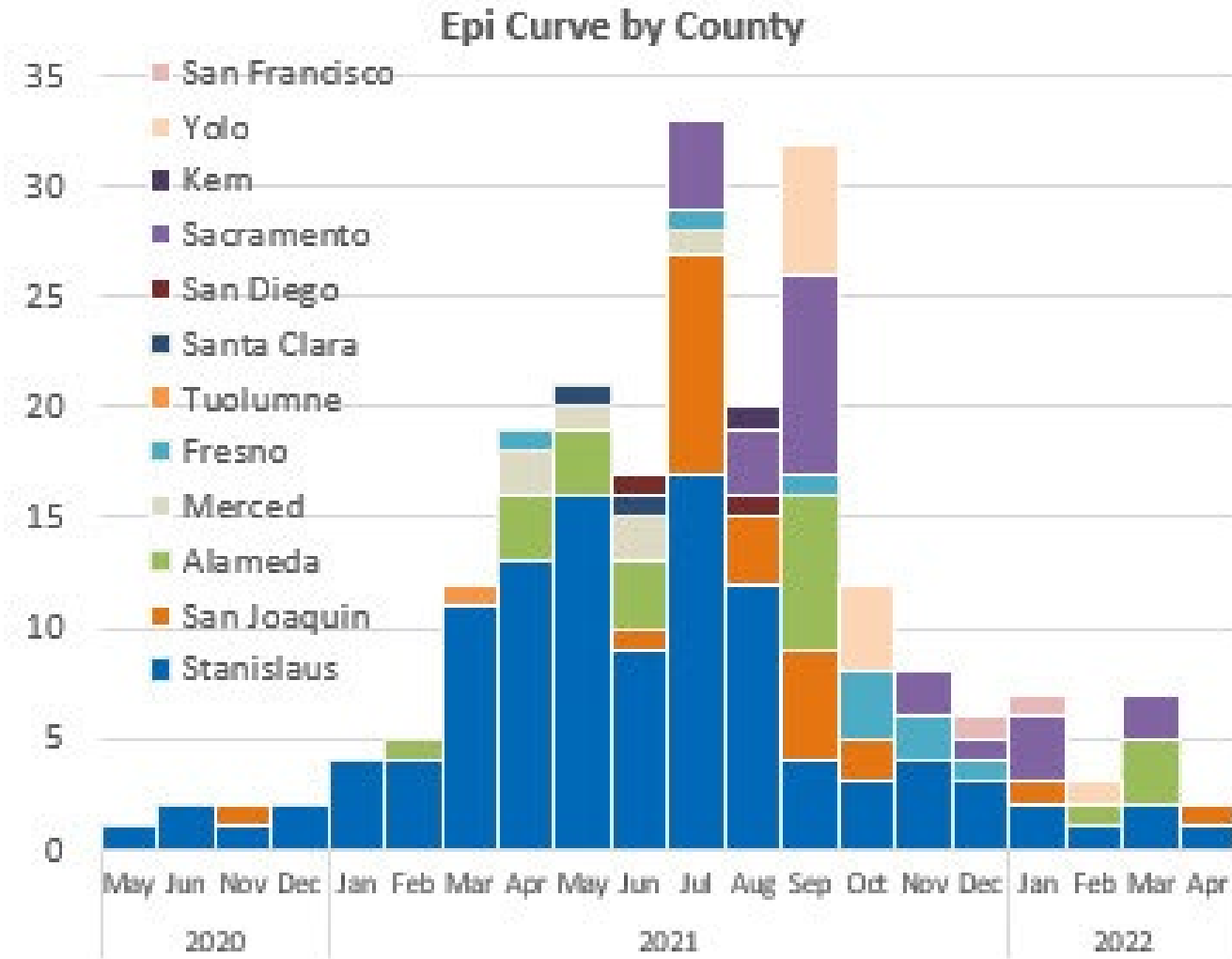
O is for Organism

- **CPO = Carbapenemase-producing organism**
 - A subset of CRO are CPO
 - CPO are resistant to carbapenem antibiotics because they have a carbapenemase
- Enterobacterales (**CP-CRE**)
- *Pseudomonas aeruginosa* (**CP-CRPA**)
- *Acinetobacter baumannii* (**CP-CRAB**)

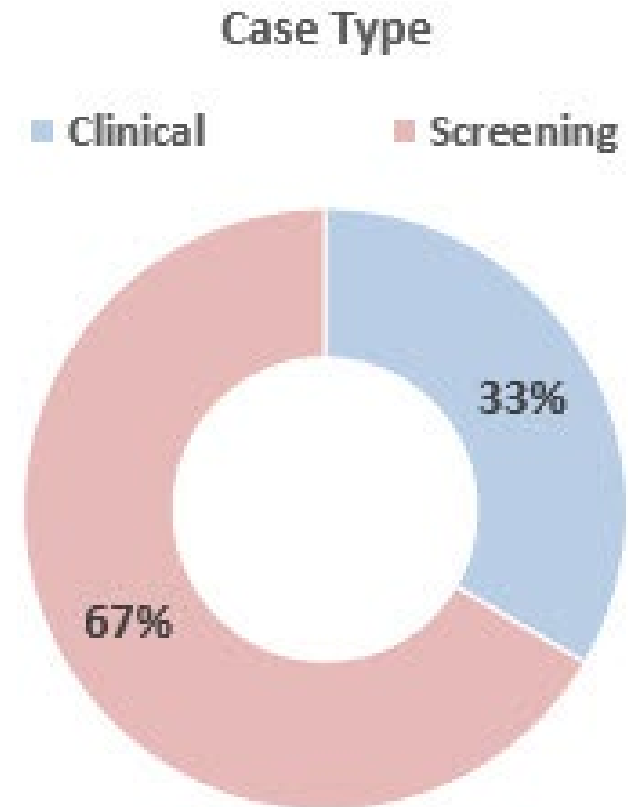
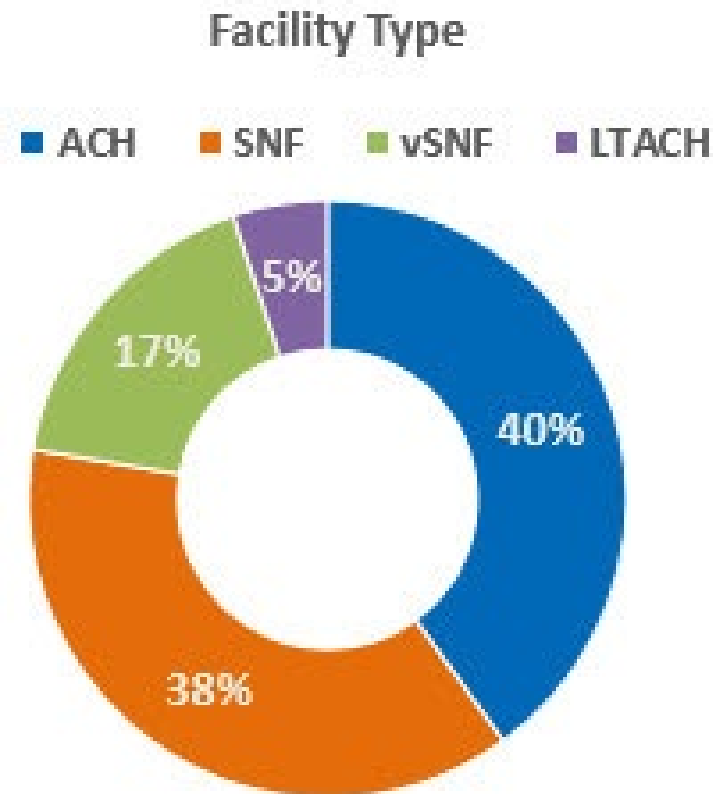


NDM CRAB

- NDM in CRAB rare, not routinely reported in the US
- NDM CRAB are **highly drug-resistant and transmissible**
- Regional outbreak
 - 215 cases May 2020–April 2022
 - 36 healthcare facilities
 - 12 LHJ
- 4 vSNF outbreaks



NDM CRAB Cases by Facility and Case Type



May 2020
1 Case



Jan 2021
11 Cases



Apr 2021
47 Cases



Jul 2021
118 Cases



Oct 2021
183 Cases



Jan 2022
204 Cases



COVID-19 and Surge-related IPC Challenges in Healthcare Settings

- **Cohorting** patients on COVID-19 status only
- Improper and overuse of **PPE** (e.g., double-gloving, -gowning)
- Inadequate environmental **cleaning and disinfection** (e.g., agent without MDRO label claim or contact time achieved for SARS-CoV-2 only)
- Implementation of **crisis capacity strategies** during PPE shortages (e.g., extended use of gowns/gloves)

RESPONSE AND CONTAINMENT

FACILITY-BASED ACTIONS

Healthcare-associated MDRO*:

Containment, Infection Control Measures

	<i>C. auris</i>	<i>Acinetobacter</i>	Other MDRO (e.g., CRE)	<i>C. diff</i>
Good hand hygiene – ABHS preferred	X	X	X	Soap & water
Contact precautions, single room if possible	X	X	X	X
Thorough environmental cleaning and disinfection	Use List P /List K agent (www.epa.gov/pesticide-registration/list-p-antimicrobial-products-registered-epa-claims-against-candida-auris)	X	X	Use List K agent (www.epa.gov/pesticide-registration/list-k-epas-registered-antimicrobial-products-effective-against-clostridium)
Routine adherence monitoring	X	X	X	X
Cohorting of patients and healthcare personnel	X	X	X	X
Lab surveillance	X	X	X	X
Screening of high-risk contacts	X	X	X	

*Including *Clostridioides difficile* (*C. diff*); ABHS=alcohol-based hand sanitizer; *C. auris*=*Candida auris*; CRE=carbapenem-resistant Enterobacterales



Containment, Infection Control Measures

	<i>C. auris</i>	<i>Acinetobacter</i>	Other MDRO (e.g., CRE)	<i>C. diff</i>	SARS-CoV-2
Good hand hygiene – ABHS preferred	X	X	X	Soap & water	X
Contact precautions, single room if possible	X	X	X	X	+ respirator, eye protection
Thorough environmental cleaning and disinfection	Use List P /List K agent (www.epa.gov/pesticide-registration/list-p-antimicrobial-products-registered-epa-claims-against-candida-auris)	X	X	Use List K agent (www.epa.gov/pesticide-registration/list-k-epas-registered-antimicrobial-products-effective-against-clostridium)	Use List N agent (List P/K agent OK) (www.epa.gov/pesticide-registration/list-n-disinfectants-coronavirus-covid-19)
Routine adherence monitoring	X	X	X	X	X
Cohorting of patients and healthcare personnel	X	X	X	X	X
Lab surveillance	X	X	X	X	X
Screening of high-risk contacts	X	X	X		X

*Including *Clostridioides difficile* (*C. diff*); ABHS=alcohol-based hand sanitizer; *C. auris*=*Candida auris*; CRE=carbapenem-resistant

Core Infection Control Practices

- **Hand hygiene**



- 5 moments
- ABHR preferred over soap & water (unless hands visibly soiled/*C. diff*)
- Gloves **not** a substitute for hand hygiene

- **Environmental cleaning and disinfection**



- Adhere to contact time
- Use agent with MDRO claims; for *C. auris*, [List P agent](#) (List K, bleach OK) (www.epa.gov/pesticide-registration/list-p-antimicrobial-products-registered-epa-claims-against-candida-auris)
- High-touch surfaces, mobile medical equipment

Core Infection Control Practices

- **Transmission-based precautions**
 - Contact precautions
 - Repeat cultures **not** necessary for “clearance” – patients remain colonized



Enhanced Standard Precautions

- SNF may implement **Enhanced Standard precautions**
 - If NO evidence of transmission
 - Based on patient risk factors for transmission
 - Donning gown and gloves at point of care for high-contact activities
 - **Consult public health for training and assessing readiness**
 - **Tune in next week for more information!**

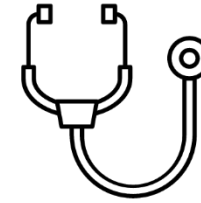
The Six Moments of Enhanced Standard Precautions
For these six groups of care activities, use hand hygiene, gloves, and gowns.



Infection Control: Dedicated Staff and Equipment

Equipment

- Dedicate daily care equipment (e.g., blood pressure cuffs)
- Consider single-use, disposable non-critical devices (e.g., temperature probe)



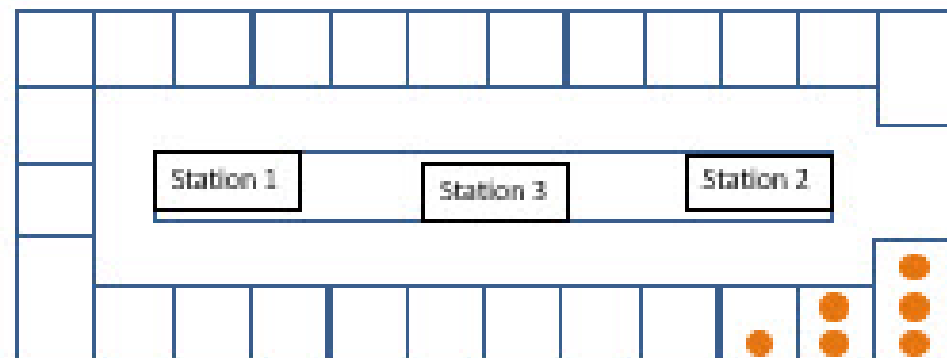
Staff

- If multiple MDRO-positive residents in facility:
 - Place in rooms in same geographic area
 - Dedicate primary staff (e.g., nursing)
 - Staff should care for non-MDRO-positive residents before MDRO-positive residents



Patient Placement

- Avoid unnecessary patient movement
- Cohort patients with the same MDRO, regardless of specimen source, infection or colonization status
 - *C. auris* with *C. auris*
 - For CPO: by carbapenemase enzyme (e.g., NDM with NDM)
- Place in the same geographic location
- **Cohorting can be very complicated, so please consult with public health prior to cohorting residents with MDROs!**



Adherence Monitoring

- Evaluate implementation of infection control measures with tools
- Provide feedback to staff
- [Adherence monitoring tools](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/MonitoringAdherenceToHCPracticesThatPreventInfection.aspx)
(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/MonitoringAdherenceToHCPracticesThatPreventInfection.aspx)



Healthcare-Associated Infections Program Adherence Monitoring Hand Hygiene

Assessment completed by:
Date:
Unit:

Regular monitoring with feedback of results to staff can improve hand hygiene adherence. Use this tool to identify gaps and opportunities for improvement. Monitoring may be performed in any type of patient care location.

Instructions: Observe at least 10 hand hygiene (HH) opportunities per unit. Observe a staff member and record his/her discipline. Check the type of hand hygiene opportunity you are observing. Indicate if HH was performed. Record the total number of successful HH opportunities and calculate adherence.

HH Opportunity	Discipline	What type of HH opportunity was observed? (select/ <input checked="" type="checkbox"/> 1 per line)	Was HH performed for opportunity observed? ✓ or ∅
<i>Example</i>	N	<input type="checkbox"/> before care/entering room* <input type="checkbox"/> before task <input type="checkbox"/> after body fluids <input type="checkbox"/> after care* <input checked="" type="checkbox"/> upon leaving room *Remember: Hand hygiene should be performed before <u>and</u> after glove use	✓
HH1.		<input type="checkbox"/> before care/entering room <input type="checkbox"/> before task <input type="checkbox"/> after body fluids <input type="checkbox"/> after care <input type="checkbox"/> upon leaving room	
HH2.		<input type="checkbox"/> before care/entering room <input type="checkbox"/> before task <input type="checkbox"/> after body fluids <input type="checkbox"/> after care <input type="checkbox"/> upon leaving room	







Communication

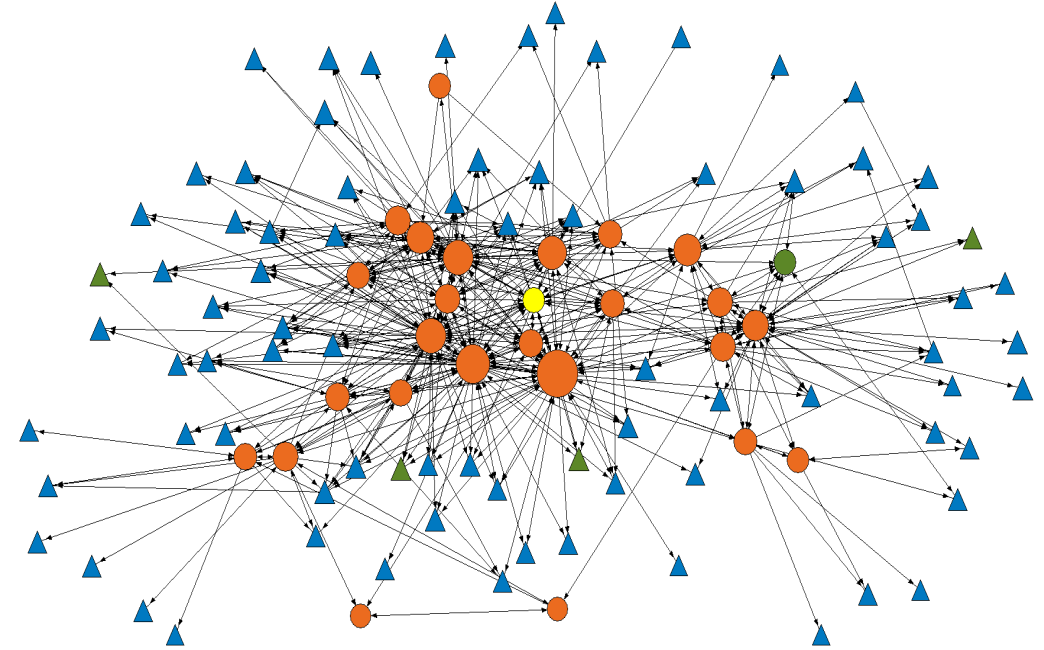
- Key to preventing inter-facility transmission!
- Actively seek MDRO status of all admissions
- Flag medical record for future admissions
- Inform receiving facility of patient MDRO status and IPC recommendations
- Educate patients and family
- Use interfacility transfer form

[Interfacility Transfer Communications Guide](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/InterfacilityCommunication.aspx)

(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/InterfacilityCommunication.aspx)

HEALTHCARE FACILITY TRANSFER FORM			
Use this form for all transfers to an admitting healthcare facility.			Attending label here.
Patient Name (Last, First): _____			
Date of Birth: _____	MRN: _____	Transfer Date: _____	
Receiving Facility Name: _____			
Contact Name: _____		Contact Phone: _____	
Sending Facility Name: _____			
Contact Name: _____		Contact Phone: _____	
RECOMMENDATIONS			
Patient currently on precautions?		If yes, check all that apply:	
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Airborne	<input type="checkbox"/> Contact
		<input type="checkbox"/> Droplet	<input type="checkbox"/> Enhanced Standard*
Personal protective equipment (PPE) to consider at receiving facility*:			
			
<input type="checkbox"/> Gloves	<input type="checkbox"/> Gown	<input type="checkbox"/> Mask	<input type="checkbox"/> N95/PAPR
			<input type="checkbox"/> Eye Protection
<small>* Long-term care facilities may implement additional contact precautions for patients with MDRO or risk factors or transfer cases, i.e., www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/InterfacilityCommunication.aspx or www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/InterfacilityCommunication.aspx for long-term care facilities. A transfer may be considered appropriate in acute care settings.</small>			
ORGANISMS (Include copy of lab results with organism ID and antimicrobial susceptibilities.)			
Patient has multidrug-resistant organism (MDRO) or other lab results requiring precautions?			
<input type="checkbox"/> Yes (record organism(s), specimen source, collection date)		<input type="checkbox"/> No	
<input type="checkbox"/> Exposed to MDRO (other (record organism(s) and last date(s) of exposure if known)			
Organism	Carbapenemase (if applicable)**	Source	Date
<input type="checkbox"/> <i>Candida auris</i> (<i>C. auris</i>)			
<input type="checkbox"/> <i>Clostridiaceae</i> spp. (<i>C. diff</i>)			
<input type="checkbox"/> Acinetobacter, multidrug-resistant (e.g., CRAB**)			
<input type="checkbox"/> Carbapenem-resistant Enterobacteriales (CRE**)			
<input type="checkbox"/> <i>Pseudomonas aeruginosa</i> , multidrug-resistant (e.g., CRPA**)			
<input type="checkbox"/> Extended-spectrum beta-lactamase (ESBL)-producer			
<input type="checkbox"/> Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)			
<input type="checkbox"/> Vancomycin-resistant <i>Enterococcus</i> (VRE)			
<input type="checkbox"/> No organism identified (e.g., molecular screening test**)			
<input type="checkbox"/> Other, specify:			
<small>(e.g., SARS-CoV-2 (COVID-19), Zika, scabies, disseminated shingles, Herpes zoster, norovirus, influenza, tuberculosis)</small>			

A REGIONAL APPROACH



What Can We Do?



Early detection, infection control and public health-coordinated responses needed to contain spread

[CDC Containment Strategy Guidelines](http://www.cdc.gov/HAI/Outbreaks/MDRO)
(www.cdc.gov/HAI/Outbreaks/MDRO)

Regional Response and Prevention

- **Coordinated multi-jurisdictional effort** with local health departments, healthcare facilities, labs
 - Investigation
 - Onsite infection prevention and control (IPC) assessments – response and prevention
 - Outbreak sites, interconnected LTACH + vSNF
 - Lab surveillance
 - Submission of clinical isolates, reporting *C. auris* and CPO
 - Screening of high-risk contacts
 - Point prevalence surveys (PPS) at outbreak sites
 - Discharge/admission screening
- Regional outbreak facility list, biweekly calls

NDM CRAB Outbreak at vSNF A

Identified four cases of NDM CRAB in the subacute unit through surveillance

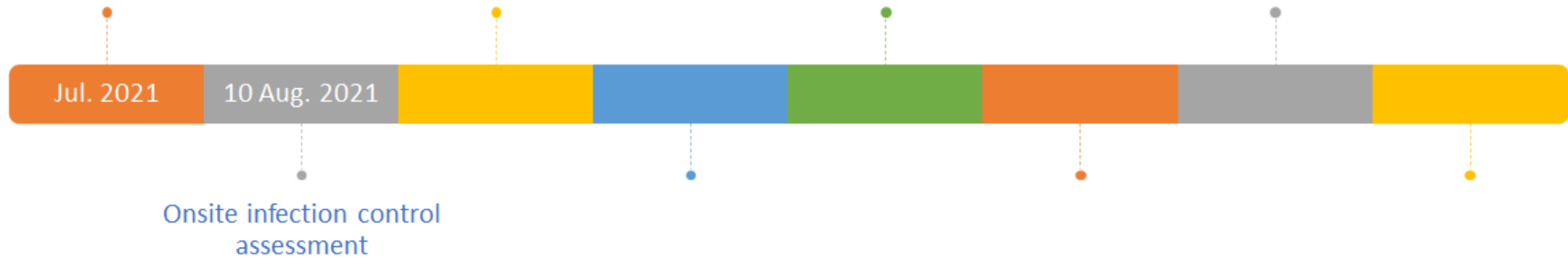
Doing routine EVS adherence monitoring



NDM CRAB Outbreak at vSNF A

Identified four cases of NDM CRAB in the subacute unit through surveillance

Doing routine EVS adherence monitoring

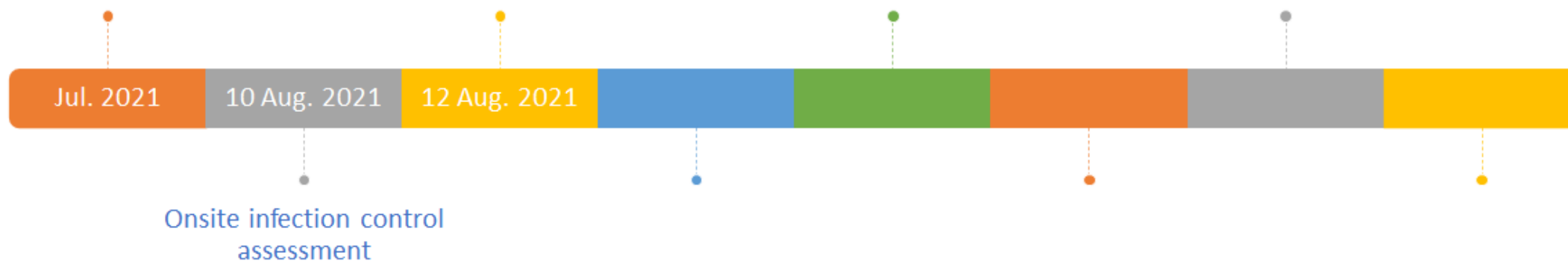


NDM CRAB Outbreak at vSNF A

Identified four cases of NDM CRAB in the subacute unit through surveillance

Doing routine EVS adherence monitoring

Additional NDM+ case identified

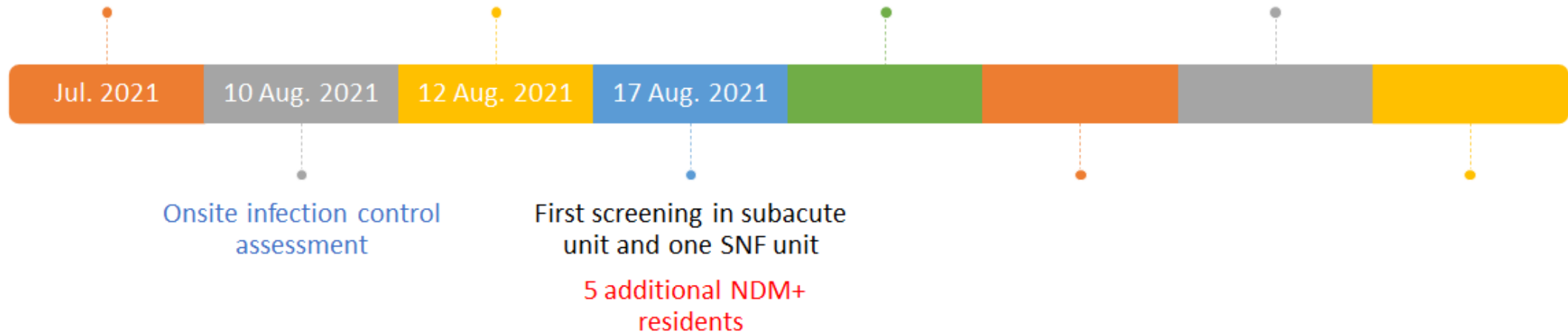


NDM CRAB Outbreak at vSNF A

Identified four cases of NDM CRAB in the subacute unit through surveillance

Doing routine EVS adherence monitoring

Additional NDM+ case identified



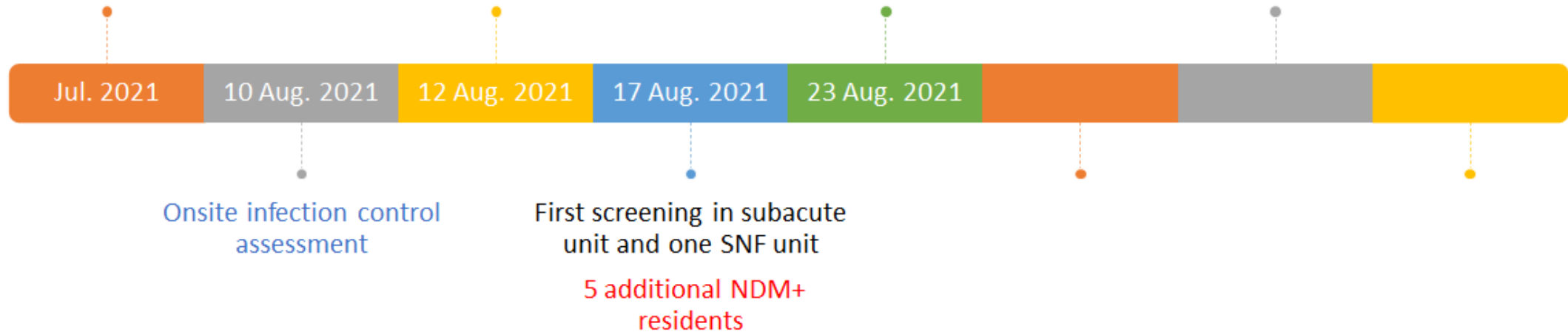
NDM CRAB Outbreak at vSNF A

Identified four cases of NDM CRAB in the subacute unit through surveillance

Doing routine EVS adherence monitoring

Additional NDM+ case identified

Began cohorting NDM+ residents; terminal cleaning in subacute unit



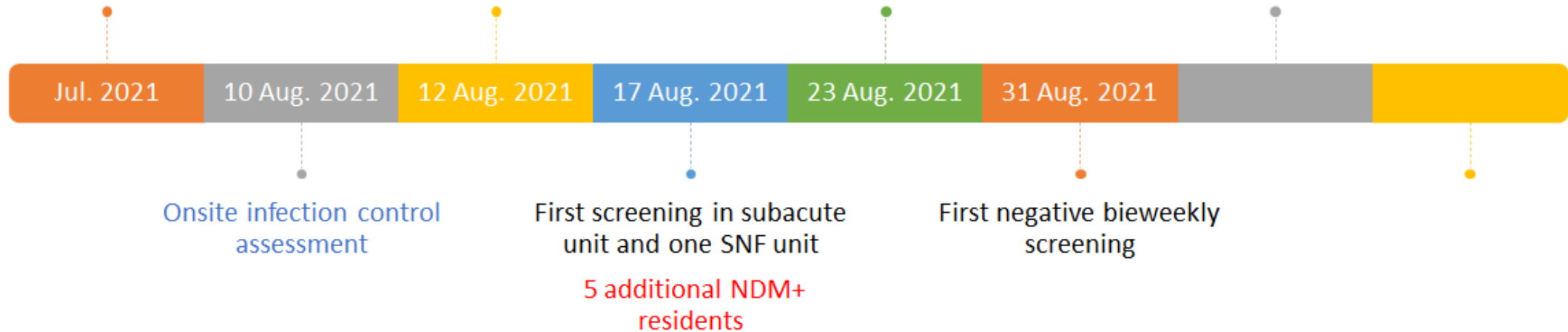
NDM CRAB Outbreak at vSNF A

Identified four cases of NDM CRAB in the subacute unit through surveillance

Doing routine EVS adherence monitoring

Additional NDM+ case identified

Began cohorting NDM+ residents; terminal cleaning in subacute unit



NDM CRAB Outbreak at vSNF A

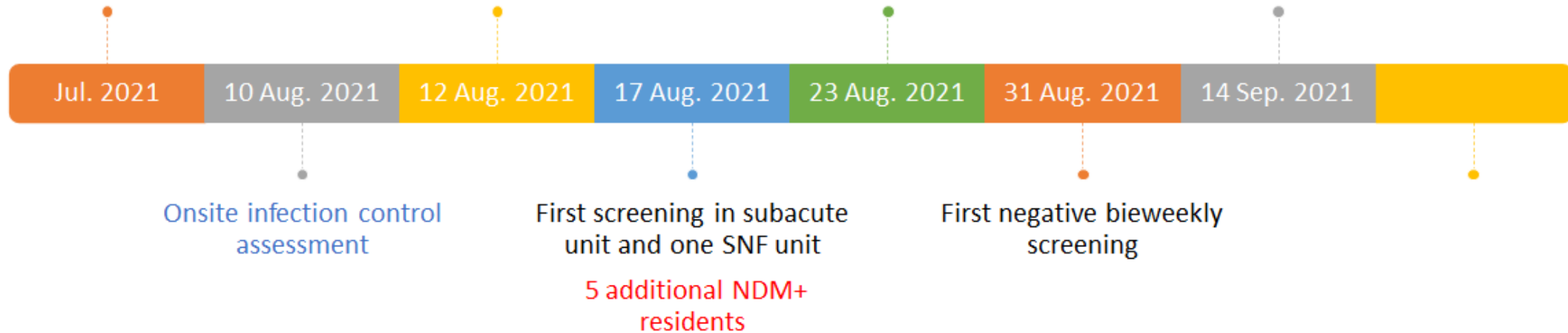
Identified four cases of NDM CRAB in the subacute unit through surveillance

Doing routine EVS adherence monitoring

Additional NDM+ case identified

Began cohorting NDM+ residents; terminal cleaning in subacute unit

Second negative biweekly screening



NDM CRAB Outbreak at vSNF A

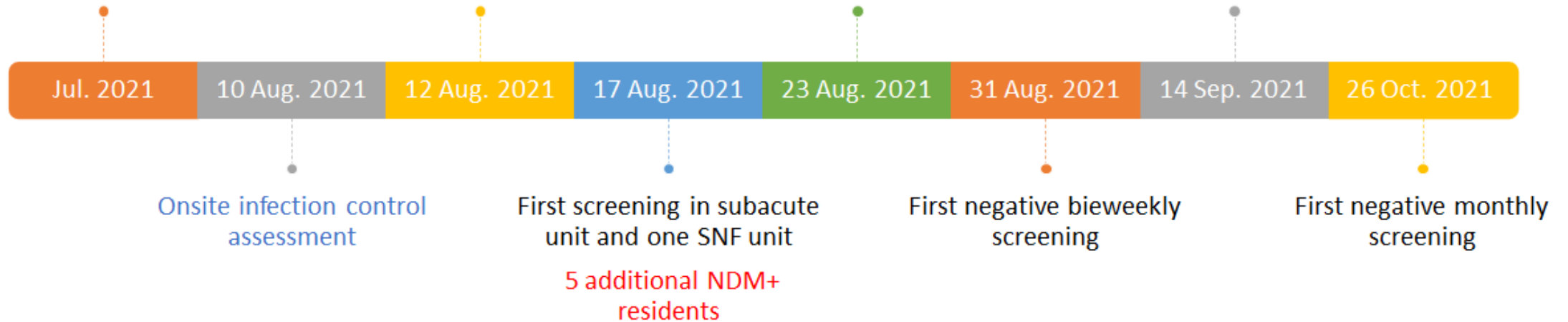
Identified four cases of NDM CRAB in the subacute unit through surveillance

Doing routine EVS adherence monitoring

Additional NDM+ case identified

Began cohorting NDM+ residents; terminal cleaning in subacute unit

Second negative biweekly screening



Containing an NDM CRAB Outbreak at vSNF A

How did vSNF A resolve their outbreak so quickly?

- IP engaged, eager to learn, receptive to making changes
 - Asked staff about their needs
 - Positive reinforcement
- Quickly **cohorted** residents; minimized unnecessary patient movement
- Learned from sister facility with NDM CRAB outbreak
 - vSNF A already doing fluorescent marker **EVS audits**
- **Active surveillance** – checked lab reports for MDROs and notified public health
- Strong **interfacility communication**
- LHD always made themselves available; supported facility throughout their outbreak and afterwards

Conclusions

- AR and MDRO are a threat to patient and resident safety
- Infected and colonized patients have poorer outcomes, fewer treatment options, and higher mortality
- MDRO can travel, leading to extensive outbreaks and transmission in healthcare facilities
- Adherence to strong, core IPC practices + active surveillance and communication can prevent spread
- We're here to help!



Resources



CDPH Resources

[CDPH *C. auris* Webpage](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)

(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)

[CDPH *C. auris* Quicksheet](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/C%20auris%20Quicksheet_Interim_070720_ADA.pdf) (PDF)

(www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/C%20auris%20Quicksheet_Interim_070720_ADA.pdf)

[CDPH *C. auris* Screening Decision Tree](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Tier2_Pathogen_Screening_Decision_Tree_Oct2020.pdf) (PDF)

(www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Tier2_Pathogen_Screening_Decision_Tree_Oct2020.pdf)

CDC/CDPH *C. auris* in Long-Term Care Facilities Webinar [Slides](#) (PDF)

(www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/C_auris_AHR_CDC_CDPHshareWebinararcCombined_ADA_121020.pdf)

CDC/CDPH *C. auris* in Long-Term Care Facilities Webinar [Recording](https://youtu.be/5ulpo7wi6xk) (youtu.be/5ulpo7wi6xk)

[CDPH Antimicrobial Resistance Resources](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/AntimicrobialResistanceLandingPage.aspx)

(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/AntimicrobialResistanceLandingPage.aspx)

[CDPH Enhanced Standard Precautions Resources](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/ESP.aspx)

(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/ESP.aspx)

[CDPH Adherence Monitoring Tools](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/MonitoringAdherenceToHCPracticesThatPreventInfection.aspx)

(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/MonitoringAdherenceToHCPracticesThatPreventInfection.aspx)

[CDPH Interfacility Transfer Communications Guide](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/InterfacilityCommunication.aspx)

(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/InterfacilityCommunication.aspx)

Additional Resources

- [AR Lab Network Testing Resources](http://www.cdc.gov/drugresistance/laboratories/ARlab-network-testing-details.html)
(www.cdc.gov/drugresistance/laboratories/ARlab-network-testing-details.html)
- [CDC *C. auris* Identification](http://www.cdc.gov/fungal/candida-auris/identification.html)
(www.cdc.gov/fungal/candida-auris/identification.html)
- [EPA Disinfectants Effective against *C. auris* \(List P\)](http://www.epa.gov/pesticide-registration/list-p-antimicrobial-products-registered-epa-claims-against-candida-auris)
(www.epa.gov/pesticide-registration/list-p-antimicrobial-products-registered-epa-claims-against-candida-auris)
- [CDC *C. auris* Information for Patients and Family Members](http://www.cdc.gov/fungal/candida-auris/patients-qa.html)
(www.cdc.gov/fungal/candida-auris/patients-qa.html)
- **Greater New York Hospital Association *C. auris* Cleaning and Management Videos**
 - [English](https://vimeo.com/350168460) (vimeo.com/350168460)
 - [Spanish](https://vimeo.com/357898819) (vimeo.com/357898819)

Next Steps

- Fill out the **course evaluation**
 - Ensure **leadership approvals** to participate (send in your Commitment Form)
 - Schedule your **onsite baseline assessment** (Goal: complete by May 31, 2022)
 - Form a team** and identify key staff (vSNF Champions!)
 - Join us for our next workshop on May 18:** Enhanced Standard Precautions
 - Access resources on [vSNF Workgroup Webpage](http://www.cdph.ca.gov/hai/vsnf) (www.cdph.ca.gov/hai/vsnf)
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Questions?

Contact Erin Garcia at Erin.Garcia@cdph.ca.gov