

# Carbapenem-Resistant Enterobacteriaceae (CRE)

An informational booklet for patients, residents, caregivers, family and friends



CDCP-ACDC-0128-01

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# About this booklet

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This booklet provides general information about what carbapenem-resistant Enterobacteriaceae (CRE) is and how to prevent the spread of infection. Whether you are a patient, resident, caregiver, family member or friend, everyone has a role in infection prevention.

This booklet was developed with help from residents, family members, caregivers, and staff from hospitals and skilled nursing facilities.



## What is CRE?

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**CRE** stands for **carbapenem-resistant Enterobacteriaceae**, which are a family of bacteria (germs) that are hard to treat because they are highly resistant to antibiotics or medicine that fights off or prevents bacterial infections.



**Carbapenems** are a group of antibiotics that are usually used to treat serious infections that are resistant to other antibiotics.



**Enterobacteriaceae** are bacteria found normally in the human intestines (gut).

**If these bacteria get into a part of the body that shouldn't have any bacteria (like the blood system, lungs, or skin), they can cause a serious infection.**

When Enterobacteriaceae are resistant to carbapenems, there are very few drugs that can be used to treat these infections. Sometimes these infections are untreatable.

## Who is most likely to get CRE?

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Healthy people usually don't get CRE. Patients in hospitals or skilled nursing facilities who are being treated for a condition are most likely to get CRE. Other patients who are especially likely to get CRE include people with:

- Weak immune systems
- Medical devices like catheters (tubes that remove liquids from the body) and
- Ventilators (breathing machines)

Also, the use of certain antibiotics might also make it more likely for patients to get CRE.

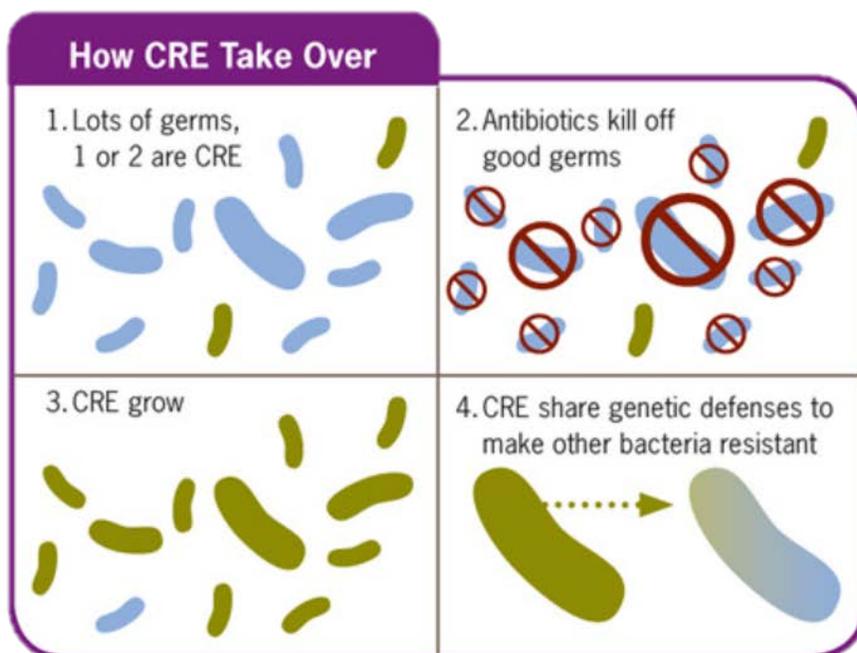
Untreatable and hard-to-treat infections from CRE are on the rise among patients in medical facilities.



# CRE and Antibiotic Resistance

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Simply taking antibiotics can create antibiotic resistance. Antibiotics can kill both bad bacteria and good bacteria (like those that prevent infection). Bad bacteria that can survive a dose of antibiotics are known as antibiotic-resistant bacteria. They can spread resistance either by multiplying, or by sharing DNA (genetic material) directly with other bacteria.



Centers for Disease Control and Prevention (CDC)

As shown above (in the graphic step #4) CRE develop specific resistance to antibiotics based on the bacteria's DNA. CRE can share these resistance genes with other bacteria and multiply, thus spreading antibiotic resistance.

# Two ways that you can have CRE

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## You can have an active infection

This means that the CRE are either on your body or in your body, and they are causing an infection. You can have an infection on your skin, in your blood, in your lungs, or in other parts of your body.

**If you have an active CRE infection, it can easily spread to other people.** Any contact with fluid from your body can spread CRE. Some examples of these fluids include:

- Mucus
- Blood
- Urine (pee)
- Stool (poop)

Objects you have contact with (like a towel) can also spread CRE.

## You can be a carrier or colonized

This means that the CRE are in your body, but they are not causing an infection that is making you sick.

If you are a carrier of CRE, **you can have the bacteria in your gut, on your skin, or on objects you have contact with and spread CRE to other people.** If you don't wash your hands properly, you can spread CRE to things you touch with your hands. CRE might be on other parts of your body. Examples of where CRE could be include:

- Fluid coming out of your mouth and nose when you sneeze
- Your skin
- In your urine or stool

Cover your mouth and nose with a tissue or your arm when you cough or sneeze, and wash your hands many times each day.

# How do healthcare facilities prevent the spread of CRE?

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Everyone who enters a hospital or skilled nursing facility should follow certain rules to prevent the spread of any bacteria. These rules are called **standard precautions**. These rules apply to everyone—people who have CRE and people who don't have CRE.

## What are standard precautions?

**Standard precautions mean that...**

**Everyone must:**

**Wash hands—**

- When entering and leaving a room.
- Before and after touching patients, residents, or roommates.
- After using the bathroom.

**Cover mouth and nose with a tissue or arm** when sneezing or coughing, wash hands afterwards, and throw away used tissues immediately.

**Doctors and staff (for example, nurses) must follow all of the above, and ALSO:**

- **Wear gloves** when touching any body fluids.
- **Wear a gown** if any body fluids could get on their clothes.
- **Wear a mask and eye protection** (goggles or shield) if body fluids could get in their eyes or on their face, and if patients or residents are coughing.
- **Clean and disinfect equipment** that is shared between patients or residents. Disposable equipment may also be used.

When someone is contagious, hospitals and skilled nursing facilities may put even stricter rules in place depending on the patient's condition. These rules are called **contact precautions**. Contact precautions may be used along with standard precautions.

## What are contact precautions?

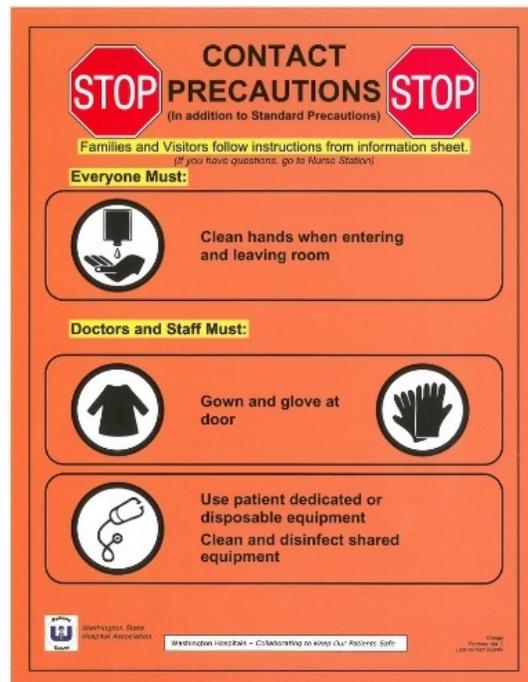
**Contact precautions mean that, in addition to standard precautions...**

### Doctors and staff must:

- **Always wear a gown and gloves when caring for patients or residents**— these are put on before entering the room and taken off before leaving the room.
- **Always clean and disinfect equipment that's shared between patients or residents.** Disposable equipment may also be used.

# What is the difference between standard and contact precautions?

**Standard precautions** are used for all patient care in order to protect healthcare providers from infection and prevent the spread of the infection from patient to patient. **Contact precautions** are used in addition to standard precautions for those who are suspected to have serious illness that is easily spread by indirect or direct contact with items in his/her environment. The healthcare facility will decide which type of precautions are needed, depending on each patient's situation.



# How can I prevent the spread of CRE?

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## Wash your hands...

- When entering and leaving your room.
- Before and after touching other patients, residents, or roommates.
- After using the bathroom.
- Before and after touching your eyes, nose, mouth, genitals (private parts), pimples, boils, sores, or rashes.

## Cover your mouth and nose

If you cough or sneeze, cover your mouth and nose with a tissue or your arm. Don't use cloth handkerchiefs. Throw away the used tissue immediately, and wash your hands right away before touching anything else.

## Remind doctors, staff, and family members to wash their hands before and after caring for you.

Remind family and friends to wash their hands when entering and leaving your room and before and after touching you. Never touch other people's cuts, sores, or rashes unless you are wearing gloves.

**If you need to stay in a healthcare facility in the future, you should tell healthcare staff about your CRE status. This way staff can take the necessary precautions.**

## What is the best way to wash hands?

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Frequent hand washing is the best way to prevent the spread of bacteria. Wash hands with soap and water, or use a hand sanitizer with at least 60 percent alcohol. **Use hand sanitizers only when hands are not visibly dirty, otherwise wash hands with soap and water.**

### Hand washing method recommended by health care providers:

1. Wet your hands first under warm running water.
2. Apply soap and rub hands together for at least 15 seconds, getting between the fingers and around nails.
3. Rinse with warm running water.
4. Dry hands with a paper towel.
5. Turn the faucet off using a paper towel. It's important to use the paper towel to turn off the faucet because the faucet handle might not be clean.
6. Throw the paper towel in the trash.



### Hand sanitizer method recommended by health care providers:

1. Put product on hands and cover all surfaces.
2. Rub hands together for 30 seconds to allow your hands to completely absorb the product and become dry.

## How can family and friends prevent the spread of CRE?

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Visits from family and friends are important for your health and healing. There are steps that your visitors can take to help protect you and themselves.

- **Frequent hand washing** is the most important thing your family and friends can do. This is especially important when they enter and leave your room, and before and after they touch you.
- If you are coughing, your family and friends should wear a mask.
- **Standard precautions** should be followed by everyone at all times (see page 7). Some hospitals may post a sign on your door explaining standard precautions. Remind your family and friends to follow the instructions on this sign.
- A **contact precautions** sign may be posted. The instructions should be followed by everyone at all times (see page 8). Remind your family and friends to follow the instructions on this sign.

If you see someone who isn't following standard or contact precautions, **please say something**. This includes doctors, staff, visitors, family members, other patients, or residents.

## How am I cared for in a healthcare facility if I have CRE?

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- When you are being transferred to a new facility, the facility where you were staying should tell any new facility that you have CRE.
- Standard precautions should be followed by everyone who takes care of you (see page 7). This means that everyone must wash their hands.
- Contact precautions may be followed as well (see page 8). This means that everyone entering your room needs to put on a gown and gloves and wash their hands.
- If you have an active infection, staff should also make sure your infection is contained. Any equipment that you are using, such as a walker or wheelchair, should be cleaned before you leave your room.
- You might be asked to stay in your room and limit any movement outside your room.
- If you have CRE, your doctor may have you bathe with special soap to decrease bacteria on your skin. This can keep the CRE bacteria from getting inside your body and can decrease spread to other people.

## Will I have a roommate?

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### **If you have an active CRE infection or if you are a carrier:**

- Every effort will be made to give you a private room.
- If no private rooms are available, then you may share a room with someone who has the same type of CRE —this is called “cohorting.”
- If cohorting isn’t possible, then you may share a room with someone who is at low risk of getting an infection.

## Does my room need extra cleaning?

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**No. Your room is cleaned the same way as other rooms.**

All rooms should be cleaned well and on a regular schedule. Special attention is given to items that are touched a lot—like the call light, telephone, television remote control, grab bars, bed rails, and door knobs.

The mop and the cleaning solution that are used in your room are only used there. The mop and the solution in the bucket are changed before being used in the next room. This helps prevent the spread of CRE.

## Home



People providing care for others with CRE should always be careful about washing their hands after contact with the person, especially after contact with wounds, helping the person use the bathroom, or after cleaning stool. Those caring for CRE patients should also wear gloves and wash their hands before and after handling any medical devices (e.g., urinary catheters or tubes that remove liquid from the body).

In addition, gloves should be used when anticipating contact with body fluids or blood. It's also a good idea to avoid sharing towels, razors, toothbrushes, bar soap, or other personal items.

**If his/her healthcare provider(s) is unaware about his/her CRE status, you should let them know so that they can take the necessary precautions.**

## How will my dishes be done?

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**Your dishes are done the same way as all other dishes.**

All dishes, glasses, silverware and trays are cleaned and disinfected by using hot water, using dish soap detergent, and by drying at high temperatures. This process kills CRE.

You don't need to use paper plates or plastic silverware.

## How should laundry of those with CRE be washed?

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They should follow these steps to prevent the spread of CRE.

CRE is killed by using **at least one** of the following:

- Hot water (at least 130°F)
- Liquid bleach or laundry soap with dry bleach
- Hot dryer (at least 160°F)

In most washing machines, the hot water setting is set at 130°F, but you may need to adjust as necessary. Refer to the manual for how to do this. A dryer can range in temperature depending on which setting, be sure to check with the manufacturer or manual to see if the hottest temperature meets the above requirement.

Colors need to be washed or dried at the above recommended temperatures, no bleach is necessary.

### Before washing laundry

Wear disposable gloves to handle laundry that is soiled with body fluids—even if the fluids have dried. Hold the laundry away from your body so bacteria don't get on your clothes.

Put laundry that is soiled with body fluids in a plastic bag, separate from other household laundry, until it is ready to wash. This will prevent

other people from touching it and to remind you to wear gloves when you handle it.

## Washing laundry

When taking laundry that is soiled with body fluids out of the bag, wear gloves and hold the laundry away from your body so bacteria doesn't get on your clothes or body. It's okay to mix laundry that is soiled with body fluids and other household laundry in the washer.

**CRE is killed by using heat or bleach.**

## Drying laundry

Dry clothes completely in a warm or hot (at least 160°F) dryer. If you used bleach or laundry soap with dry bleach to wash clothes, then it's okay not to dry clothes in the dryer.

## Using Community Laundromats

If you use a community laundromat, make sure the washer and dryer temperatures meet the above requirements. You can ask the laundromat or check with the manufacturer of the washers and dryers used at the location.

## What if family and friends have questions?

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First have families and friends talk to the doctor or nurse caring for you.

If they want more information, they can ask to talk with the infection preventionist in the healthcare facility.

# Resources



**Los Angeles County Department of Public Health (LAC DPH):**

<http://publichealth.lacounty.gov/acd/Diseases/CRE.htm>



**California State Department of Health (CDPH):**

<https://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH/DocumentLibrary/CREQuicksheetMarch2017.pdf>



**Centers for Disease Control and Prevention (CDC):**

<https://www.cdc.gov/hai/organisms/cre/cre-patientfaq.html>

# Acknowledgements

The Los Angeles County Department of Public Health, [Acute Communicable Disease Control Program](#) would like to thank the Washington State Department of Health for granting permission to adapt this booklet from the CRE booklet, [“Moving to a hospital or skilled nursing facility: What to expect when you have CRE”](#), from which portion of this booklet is based.

The booklet: <https://www.doh.wa.gov/Portals/1/Documents/5000/CRE-Final.pdf>

Residents, family members, and staff involved in testing this booklet:

[Washington State Department of Health](#)

[Clark County Public Health Department](#)

[Tacoma-Pierce County Health Department](#)

Pierce County Antimicrobial Resistance Task Force – Infection Control & Prevention Committee

[Puget Sound Association for Professionals in Infection Control](#)

[Washington State Hospital Association](#)