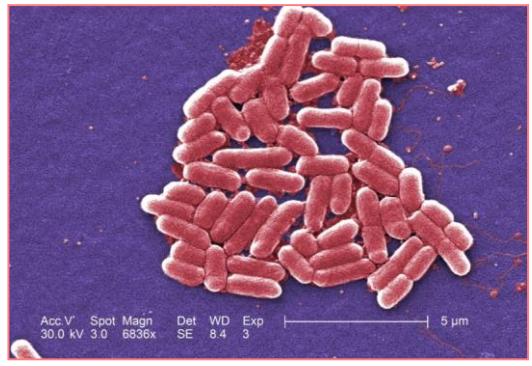
The Enterobacteriaceae

- **Family of over 70 species of bacteria**
  - Most common: *Klebsiella* spp., *Escherichia coli*, *Enterobacter* spp.
- **Enteric organisms**
- **Common cause of healthcare-associated infections**
  - Urinary tract infections
  - Bacteremia
  - Pneumonia
  - Wound infections
- **Carbapenem antibiotics (e.g., meropenem)**
  - **Last main line of defense!**



1

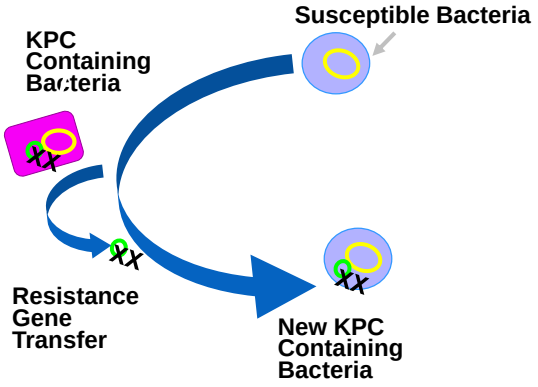
Carbapenem-Resistant Enterobacteriaceae (CRE)

- **Difficult to treat**
  - Pan-resistant strains
  - New antibiotic development is slow
- **Infections associated with high mortality rates**
  - **CRE infections are on the rise**
- **Prolonged colonization**

2

Carbapenemase-Producing CRE (CP-CRE)

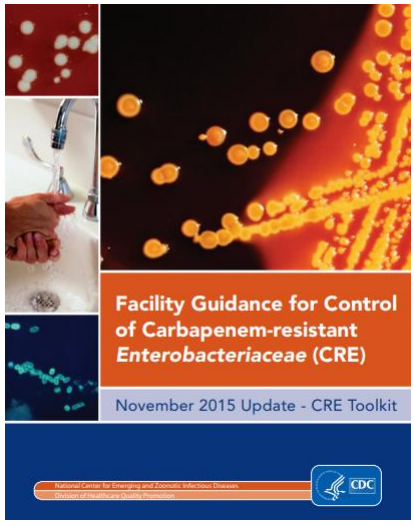
- Carbapenemase: enzyme that breaks down carbapenems and other antibiotics
  - KPC, NDM, OXA-48, IMP, VIM
- CP-CRE: CRE that carry genes for carbapenemase production
  - Can spread the genes to other bacteria, making them resistant
  - Can cause major outbreaks in health care facilities



3

Infection Control for CP-CRE

- Single room & contact precautions (including future hospitalizations)
- Reinforce adherence to infection control precautions for MDROs
- Environmental cleaning
- Prospective surveillance/lab lookback
- Notify receiving facility if transferring patient
- Colonization screening of roommates and possibly other contacts



http://www.cdc.gov/hai/pdfs/cre/CRE-guidance-508.pdf

Scenario Part 1

- **August 1st:** 72 year old male is admitted to a Minneapolis acute care hospital following a car accident.
- **August 3rd:** Patient complains of dysuria, frequency, and urgency. Urine culture collected.
- **August 4th:** Urine culture shows *E. cloacae* resistant to carbapenems (CRE).
  - Patient placed in contact precautions.
  - Isolate sent to the Minnesota Department of Health for further testing.
- **August 8th:** Hospital notified by the Minnesota Department of Health that the urine culture contained KPC+ *E. cloacae* (CP-CRE).

5

Question for Large Group Discussion

- **What should the hospital do next?**

6

Scenario Continued

- **August 15th**: Patient improving and was accepted for transfer to a skilled nursing facility for short-term rehab.

7

Table Discussion Question Set 1

- **What should the hospital communicate with the receiving SNF?**
- **What should the SNF ask related to MDROs when receiving patients?**
- **What should the SNF do upon receiving patient?**
- **How would your facility handle pending lab results at discharge?**

8

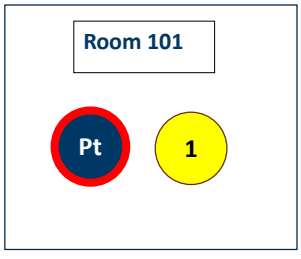
Table Discussion Question Set 2

- **What are some examples of effective interfacility communication of MDROs?**
- **What are some of the challenges you see with interfacility communication of MDROs?**
- **What is the format of this communication (i.e. verbal, written, review of discharge summary, transfer form, etc.)?**
- **How could interfacility communication of MDROs be improved?**
- **What does intrafacility communication of MDROs look like?**
  - Who in your facility receives information about MDROs upon patient transfer?
  - How are MDROs communicated within your facility?

9

Scenario Continued

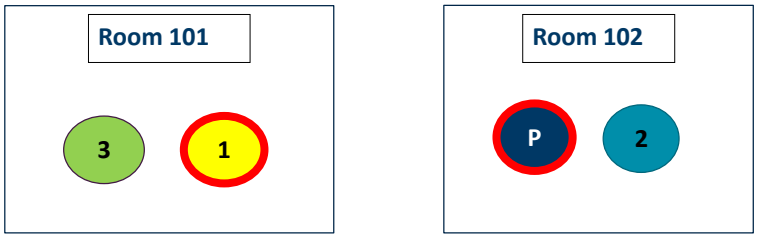
- **August 15th**: Patient transferred to SNF.
  - ACH does not communicate CP-CRE culture with receiving SNF.
  - Patient placed in double occupancy room and is not on contact precautions.
  - Roommate has been in the facility for 1 week and has a foley catheter in place.



10

Scenario Continued

- **August 22nd:** Patient moves to different double occupancy room.
  - Roommate 2 has been in the facility for 1 week and has a foley catheter in place.
  - Roommate 1 receives new roommate (roommate 3).
- **August 24th**: Roommate 1 develops symptoms of UTI. Urine culture collected.



11

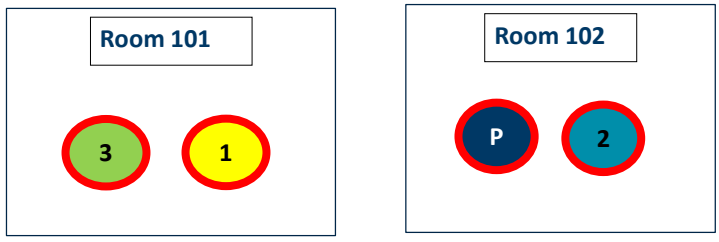
Scenario Continued

- **August 25th**: Urine culture from roommate 1 is positive for carbapenem-resistant *E. cloacae* (CRE). Isolate sent to MDH for further testing
- **August 29th**: SNF notified by the Minnesota Department of Health that the urine culture from Roommate 1 contained KPC+ *E. cloacae* (CP-CRE).
  - Contact precautions instituted. No single rooms currently available.
  - MDH conducts routine follow-up with SNF staff.
  - During follow-up, SNF shares with MDH that Roommate 1 has a current roommate as well as a previous roommate. When learning previous roommate's name, MDH realizes this is a previous case of CP-CRE.

12

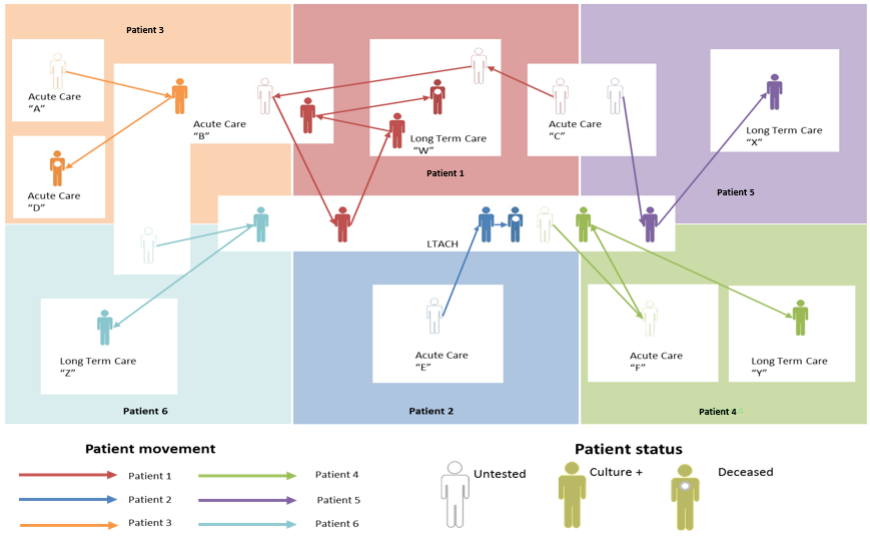
Scenario Continued

- **August 29th**: As part of routine response to CP-CRE, the SNF collects rectal swabs from roommates 2 and 3 to determine if further transmission occurred.
- **August 30th**: Testing of rectal swabs at MDH shows KPC from both swabs.



13

Example of a MN Outbreak of CP-CRE



Summary

- **Interfacility communication of MDROs can help prevent MDRO transmission within facilities and regions**
- **Important not just for preventing CP-CRE, but for preventing all MDROs (MRSA, VRE, ESBL, CDI)**
- **Transfer directionality is variable. Healthcare facilities of all types need processes for obtaining MDRO information upon admission and sharing MDRO information upon transfer.**

15