Outlining Containment Plans for CR-PA

HAI/AR Grantee Meeting: Simulation Activity

March 20, 2018

Agenda

Topic	Timing
Introduction to the Case	10 minutes
State Notification	10 minutes
Case History	10 minutes
Immediate Recommendations & Next Steps	10 minutes
Facility Assessments & Contact Evaluations	15 minutes
Transmission Screening & Point Prevalence Surveys	20 minutes
Follow-Up	15 minutes

What Will We Accomplish Today?

1

Containment Planning

Define plans for multi-drug resistant organism (MDRO) containment across the continuum of care

2

Awareness of Resources

Increase awareness of new AR Lab Network resources for containment and response

3

Engaging Stakeholders

Collaborate between laboratory scientists, epidemiologists, and other key players to apply containment principles

Ground Rules

Limit multitasking | Stay open to new ideas | Critique ideas, not people | Have fun | Challenge long-held beliefs

Facilitator may request permission to interrupt | Listen respectfully | Share your unique perspective

Part 1: State Notification

Your health department is notified of a healthcare-associated carbapenem-resistant *Pseudomonas aeruginosa* (CR-PA) from the state public health laboratory. Your job is to start your investigation.

Part 1: Notification

10 MINS

You Learn That…

March 4, 2018

A short-stay acute care hospital clinical laboratory identifies a carbapenem-resistant *Pseudomonas aeruginosa* (CR-PA) from a sputum culture taken on March 1. The isolate is forwarded to the state lab for mechanism testing through the AR Lab Network.

March 8, 2018

You are notified by your state lab that the isolate produces active-on-imipenem Metallo-β-lactamase (IMP), a plasmid-mediated carbapenemase that is extremely rare in the U.S. They tested the isolate using the CDC IMP PCR assay. This is the first IMP-producing CR-PA for the hospital and for the region.

Discussion Questions

1. Over the past few years, your state has had a few NDM and OXA-48-producing carbapenem-resistant Enterobacteriaceae (CRE) reported, but no VIM or IMP-producing CRE and no carbapenemase-producing carbapenem-resistant *Pseudomonas aeruginosa* (CP-CRPA). **With confirmation from your state laboratory, are there any additional actions that need to be taken at this point?**
2. What additional information do you require for containment?

Part 2: Case History

You call the hospital where the isolate was identified. The hospital's infection preventionist provides the patient's history.

Part 2: Case History

10 MINS

You Learn That…

February 4-26, 2018

Hospitalized three weeks abroad:

- On February 4, while visiting family in Mexico, the 36 year old patient was in a motor-vehicle accident, which resulted in traumatic head injury, pulmonary contusions, diaphragmatic rupture, and multiple fractures.
- She was immediately admitted to the intensive care unit (ICU) of a Mexican hospital. After 12 days, she was moved to a step-down unit.
- Following 10 days in the step-down unit, she was transferred directly to a U.S. acute care hospital.
- She is ventilator-dependent and has a foley urinary catheter.

February 26-March 3, 2018

Direct transfer to a U.S. short-stay acute care hospital for one week:

- On February 26, she was directly admitted to the stepdown unit of a U.S. short-stay acute care hospital (ACH).
- She was not on Contact Precautions.
- She had one roommate for the duration of the admission.
- She remained ventilator-dependent for the duration of the admission.
- On ACH day 5 (March 1), a sputum specimen was collected from her trach.
- On ACH day 7 (March 3), shortly before her transfer to an LTACH, a CR-PA was identified from the sputum specimen.

Part 2: Case History

10 MINS

You Learn That…

March 3, 2018

Direct transfer to an LTACH:

- On March 3, she was transferred to a long-term acute care hospital (LTACH). The hospital communicated to the LTACH that the patient had an MDRO.

March 3-8, 2018

Notifications:

- On March 3, the hospital lab identified carbapenem-resistant *Pseudomonas aeruginosa* (CR-PA).
- On March 8 (TODAY), you received the AR Lab Network alert for this IMP-producing *Pseudomonas aeruginosa*, so you contacted the hospital IP for this additional history.
    - You call the LTACH where the patient was transferred. The infection preventionist tells you that the patient is on Contact Precautions and is currently in a double room because no single rooms are available.

Discussion Questions

1. What are the key pieces of information from the hospital's infection preventionist?

Part 3: Immediate Recommendations and Next Steps

You reviewed the patient's history. Your job is to identify the next steps for immediate action for both facilities.

Part 3: Immediate Recommendations and Next Steps

10 MINS

Discussion Questions

Based on the case history,

1. Do you need to notify any facilities about this patient's status?
2. What recommendation(s) do you make to the short-stay ACH to prevent spread of IMP-producing organisms?
3. What recommendation(s) do you make to the LTACH to prevent spread of IMP-producing organisms?
4. Do you anticipate challenges in implementation of these recommendations at either facility? If so, what are they?

Part 4: Facility Assessments and Contact Evaluation

You have decided to visit both facilities to perform an ICAR assessment and determine the need for screening.

Part 4: Facility Assessments and Contact Evaluation

15 MINS

You decide to perform transmission screening…

March 9, 2018

On the first site visit to the short-stay acute care hospital, the ICAR shows that adherence to hand hygiene and Contact Precautions is excellent and environmental cleaning is thorough.

The short-stay acute care hospital has 360 beds (80 per floor). Each floor is divided into four 20-bed units.

Discussion Questions

1. Do you recommend screening to assess for IMP transmission in the short-stay ACH?
    - If yes, which patients would you recommend prioritizing?
    - How would you explain the importance of screening to the facility?
    - How would you explain available resources and screening logistics to the facility?

Part 4: Facility Assessments and Contact Evaluation

15 MINS

You decide to perform transmission screening…

March 10, 2018

On the first site visit to the LTACH, your ICAR assessment finds significant infection control concerns. Hand hygiene adherence is 40%, there is limited availability of gowns although gloves are readily available, and healthcare personnel have a poor understanding of transmission-based precautions. While observing a daily clean, you notice an EVS staff member cleaning a Contact Precautions room and returning to the cart for supplies without changing gown and gloves.

You learn that wound care, physical therapy, respiratory therapy, and occupational therapy staff are shared between patients on both floors. Patients are rarely moved between the floors, however.

Additionally, although the index patient's MDRO status had been communicated by the acute care hospital and she was placed in Contact Precautions upon admission to the LTACH on March 3, she had a roommate due to lack of available single rooms.

The LTACH has 50 beds on 2 floors (25 beds/floor).

Discussion Questions

1. Do you recommend screening to assess for IMP transmission at the LTACH?
    - If yes, who do you recommend prioritizing for screening?

Part 5: Transmission Screening and Point Prevalence Surveys

Your health department decides to implement screening at the facilities. Your job is to identify a process for screening and determine how to engage all relevant partners.

Part 5: Transmission Screening and Point Prevalence Surveys

20 MINS

You Learn That…

Screening Ability & Capacity

Before you pursue any screening, you need to know if the IMP variant that was identified by PCR assay can also be identified using the Cepheid Carba-R assay. (This is a special consideration for IMP)

Your state lab does not have a Cepheid platform, so the isolate is shipped through the AR Lab Network to the regional lab. The regional lab confirms this IMP variant is detected on Cepheid Carba-R. **You use the AR Lab Network to coordinate recommended screening.**

ACH

Patient Screening:

- The short-stay acute care hospital agrees to screen the patients who overlapped with the index case for three or more days, including her roommate. The hospital identifies 12 patients who overlapped with the case patient on the unit. Nine are still admitted, including her roommate.

LTACH

Patient Screening:

- You decide with the LTACH administrators to do a point prevalence survey, screening all patients on the same floor as the index case (25 patients).

Part 5: Transmission Screening and Point Prevalence Surveys

20 MINS

Discussion Questions

1. Who approves each request for colonization screening?
2. How will you coordinate with the AR Lab Network regional lab for screening?
3. Who will collect screening swabs?
4. Who will receive testing results?

Part 5: Transmission Screening and Point Prevalence Surveys

20 MINS

You Learn That…

ACH

Contact Screening:

- March 12, 2018 – 9 patients are screened:
- The next day, the regional lab reports the patient's roommate screened IMP positive. The other 8 patients screened negative.

LTACH

LTACH Point Prevalence Survey #1:

- March 13, 2018 – A point prevalence survey of the LTACH floor screens 24 patients (i.e., 25 beds, minus case patient)
- The next day, the regional lab reports both the roommate and the patient in the room directly across the hall screen IMP positive.
- Additionally, the Cepheid detects 4 patients who are *Klebsiella pneumoniae* carbapenemase (KPC) positive. KPC has been identified before in this metropolitan area, but it is not frequently reported (there is approximately one clinical case every month or two).

Discussion Questions

5. What are next steps (interventions/screening) for the ACH?
6. What are the next steps (interventions/screening) for the LTACH?
7. Does understanding regional epidemiology of KPC within your state help you interpret the findings of the PPS?
8. Can the regional lab determine which organisms harbor the IMP and KPC mechanisms?
9. How can you evaluate whether infection control practices are improving?

Part 6: Follow-Up

Your health department decides additional screening is necessary to ensure your recommendations are effective. Your job is to conduct follow-up point prevalence surveys and determine whether transmission is occurring.

Part 6: Follow-Up

15 MINS

You Learn That…

March 19, 2018

ACH Point Prevalence Survey #1:

- Screening is expanded to a point prevalence survey of the whole unit. 20 patients are screened:
- No new cases are identified.

Discussion Questions

1. Do you recommend additional screening?

Part 6: Follow-Up

15 MINS

You Learn That…

April 2, 2018

ACH Point Prevalence Survey #2:

- 15 patients are screened in the second point prevalence survey:
- No new cases are identified.

Discussion Questions

1. Do you recommend additional screening?

Part 6: Follow-Up

15 MINS

You Learn That…

March 26, 2018

LTACH Point Prevalence Survey #2:
The LTACH tells you by phone that they have implemented most of your recommendations. They re-trained all staff in hand hygiene and PPE use, and compliance has improved significantly. They have created two patient cohorts, one for patients with IMP and one for patients with KPC.

- March 26, 2018 – 47 of 50 patients are screened:
- No new IMP cases are identified.
- 2 new KPC cases are identified, both patients are on the floor where other carbapenemase-producing organisms (CPOs) were identified. One patient was negative on PPS #1. The other was admitted 10 days prior to the PPS and had a negative admission screen.
- All admission screening since the first PPS has been negative.

Laboratory update: The regional lab isolates KPC-K. *pneumoniae* for all KPC+ swabs from the first PPS. Isolates are shipped to your state laboratory for PFGE. The 4 isolates are indistinguishable or closely related (0-1 bands different).

Discussion Questions

1. Is transmission occurring in this facility?
2. If you decide to conduct additional screening, would you screen facility-wide or perform more focused screening?

Part 6: Follow-Up

15 MINS

You Learn That…

April 9, 2018

LTACH Site Visit #2 and Point Prevalence Survey #3:
The LTACH tells you they have now implemented all of your recommendations and hand hygiene adherence remains high. You conduct a second site visit on April 9, the same day swabs are collected for PPS #3. You observe that hand hygiene compliance is now 86%. Supply boxes have been placed outside patient rooms and are stocked with gloves and gowns. However, you observe one physician wearing his gown in the hallway. You also notice that the portable x-ray machine is not cleaned between patient rooms. You provide feedback on site.

Since PPS #2, one new KPC case has been identified from admission screening.

April 9, 2018 – Since transmission is limited to one LTACH floor, subsequent screening is limited to that floor. 23 patients are screened:

- One new IMP case is identified.

Discussion Questions

1. Transmission is still occurring on this floor of the facility. What additional measures would you consider?.

Part 6: Follow-Up

15 MINS

You Learn That…

April 23, 2018

LTACH Site Visit #3 and Point Prevalence Survey #4:
You conduct another site visit to assess infection control practices. The facility's hand hygiene compliance is now 97%. You observe daily and terminal environmental cleaning of rooms secretly marked with Glo Germ. All the marks are removed.

25 patients are screened:

- One new KPC case is identified in a patient who had two prior negative screens. This patient's room is in close proximity to the cohort of KPC patients

Discussion Questions

1. What feedback on infection control practices do you provide to the facility?
2. What are your next steps?

Part 6: Follow-Up

15 MINS

You Learn That…

May 7, 2018

LTACH Point Prevalence Survey #5:

- 25 patients are screened
- No new cases are identified

May 21, 2018

LTACH Point Prevalence Survey #6:

- 25 patients are screened
- No new cases are identified

Discussion Questions

1. Transmission has stopped at this facility. Is there anything else to do?