

# **Local and Tribal Health Department Healthcare-Associated Infection (HAI) and Infection Prevention Training Workbook**

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## Workbook 4: Multidrug-Resistant Organisms



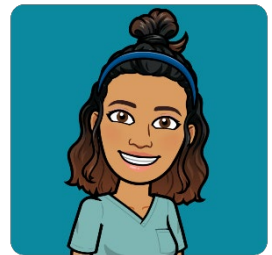
WISCONSIN DEPARTMENT  
of HEALTH SERVICES

## How to Use this Workbook

This workbook covers a number of topics in a variety of different formats to help local and Tribal health departments (LTHDs) increase their knowledge on HAIs and infection prevention and control practices. The scenarios and questions included in this workbook are intended to enhance your own, self-paced learning. Each workbook includes a list of learning objectives, self-paced learning activities, links to additional helpful resources related to a given topic, and an answer key.

### Meet Izzy

Throughout the program, you will follow Izzy, a communicable disease investigator at her local health department in charge of all things infection control. Using what you learn in each section, you will help Izzy provide infection control consultation and assistance to those in her jurisdiction.



## Workbook 4 Objectives

By the end of this workbook, you will be able to:

- Identify multidrug-resistant organisms (MDROs) reportable in Wisconsin.
- Explain the difference between colonization and active infection with an MDRO.
- Explain the importance of an antimicrobial stewardship program.

## Workbook 4 Activities

### Activity 1: How antimicrobial resistance happens and spreads 30 minutes

1. Review CDC's [Antimicrobial Resistance in Health Care webpage](#) to learn more about how antibiotic resistance spreads in health care facilities and beyond.
  - a. What is the estimated national cost to treat infections caused by MDROs?
  - b. What are three critical efforts to prevent HAIs and slow the spread of resistance?
  - c. What types of infection control measures can health care personnel use to prevent the spread of germs?
  - d. Without the use of infection control measures, germs can:
  - e. How does hospital wastewater contribute to antibiotic resistance?
2. Review CDC's [Controlling the Emergence and Spread of Antimicrobial Resistance](#).
  - a. What are actions local, Tribal, and state health departments can take to combat antimicrobial resistance?
  - b. What are you currently doing in your role or at your LTHD to combat antimicrobial resistance? If you're not doing anything at this time, brainstorm what could be done.

## Activity 2: MDROs

45 minutes

1. Review the Wisconsin Department of Health Services (DHS) MDRO webpages to learn more about each MDRO:
  - [Candida auris \(C. auris\)](#)
  - [Carbapenem-resistant Enterobacterales \(CRE\)](#)
  - [Methicillin-resistant Staphylococcus aureus \(MRSA\)](#)
  - [Vancomycin-intermediate Staphylococcus aureus and Vancomycin-resistant Staphylococcus aureus \(VISA/VRSA\)](#)
  - [Carbapenem-resistant Acinetobacter baumannii \(CRAB\)](#)
  - [Carbapenem-resistant Pseudomonas aeruginosa \(CRPA\)](#)
  - a. Of the above MDROs that you just reviewed, which ones are considered reportable conditions Wisconsin?
  - b. Which one of these organisms is not a bacterium?
  - c. Which of these organisms is still relatively rare?
  - d. True or false: Antibiotics do not work against *C. auris*.
  - e. True or false: People who are colonized with CRE require treatment.
  - f. What types of infections can CRE cause?
2. Review the [MDRO factsheet for patients, residents, and families](#).
  - a. How do MDROs spread in health care settings?
  - b. Can someone with an MDRO spread it to others? Who is at greatest risk?
  - c. How can spread be prevented? Provide detail on each prevention method.

### Activity 3: Reportable MDROs in Wisconsin

30 minutes

1. Review the DHS [“Reportable MDROs” webpage](#).
  - a. Which organisms are reportable? Which reportable condition category do they fall under?
  - b. What is the difference between infection and colonization?
  - c. True or false: The Wisconsin State Laboratory of Hygiene (WSLH) conducts confirmatory testing to identify reportable MDROs.
  - d. How does WSLH notify state and local public health of confirmed or probable cases in Wisconsin?
  - e. What are surveillance activities that can help identify and prevent the spread of MDROs?
2. An important guidance document to be familiar with is the [WEDSS Surveillance and Response for Targeted Multidrug-Resistant Organisms: Wisconsin Protocol for Local and Tribal Health Departments](#), and its companion [Reportable MDRO Reference Guide](#).
  - a. Which organisms does this document cover?
  - b. How are specimens classified in the Wisconsin Electronic Disease Surveillance System (WEDSS)?
  - c. What are the steps of the general case investigation for targeted MDROs?

#### Activity 4: Intro to antimicrobial stewardship 60 minutes

Watch the pre-recorded DHS [presentation on antimicrobial stewardship](#).

- a. List three takeaways from the presentation that are applicable to your role at the LTHD.

#### Activity 5: Antibiotic prescribing in Wisconsin 45 minutes

Review the DHS [report on outpatient antibiotic prescribing trends](#) in Wisconsin.

- a. List the three most commonly prescribed oral antibiotics by class.
- b. Which site of care was most likely to result in an antibiotic prescription?
- c. The rate of visits associated with prescriptions was greatest in which Wisconsin public health region?
- d. True or false: The rate of visits associated with antibiotic prescriptions was greatest for female patients.
- e. What actions are recommended based on the findings of this report?
- f. According to this report, the number of Wisconsin outpatient visits with antibiotics prescribed (per 1,000 visits) were highest during which quarter and year?
- g. What is the area deprivation index?

- h. Fill in the blank: Match the medical condition with its antibiotic indication tier using the word bank below.

<b>Tier 1</b> <b>Antibiotics are almost always indicated.</b>	<b>Tier 2</b> <b>Antibiotics are sometimes indicated.</b>	<b>Tier 3</b> <b>Antibiotics are never indicated.</b>
<ul style="list-style-type: none"> <li>• Urinary tract infection</li> <li>• Pneumonia</li> <li>• Pyelonephritis</li> <li>• </li> <li>• </li> </ul>	<ul style="list-style-type: none"> <li>• Acute pharyngitis</li> <li>• Acute sinusitis</li> <li>• Dysuria</li> <li>• Chronic sinusitis</li> <li>• </li> <li>• </li> </ul>	<ul style="list-style-type: none"> <li>• </li> <li>• </li> <li>• </li> </ul>

- Acute bronchitis
- Otitis media
- Cutaneous abscess
- Acute upper respiratory infection
- Streptococcal pharyngitis
- Cough
- Cellulitis

- i. How many prescriptions were associated with either cough, acute upper respiratory infection, or acute bronchitis in 2021?
- j. True or false: There was no significant difference in antibiotic prescribing associated with cough, acute URI, or bronchitis by location type (such as emergency department, urgent care, office, or clinic).

## Activity 6: Antimicrobial stewardship programs

30 minutes

Watch the CDC [What's New in the Core Elements of Hospital Antibiotic Stewardship Programs, 2019 video](#) and review the accompanying webpage, [Core Elements of Hospital Antibiotic Stewardship Programs](#).

- a. List five things that hospital antibiotic stewardship programs can reduce.
- b. What is the purpose of the CDC core elements of hospital antibiotic stewardship programs?

- c. List the seven core elements and briefly summarize each.

## Additional Resources

The following are optional readings, articles, and other resources for information on the topics covered in Workbook 4.

### AR and stewardship

- Read CDC's [webpage on antimicrobial resistance](#) for additional information on resistance and its effects.
- Check out the CDC [poster on how infection control can help fight antimicrobial resistance](#).
- Visit the DHS webpage on antibiotic resistance for [information and resources on antibiotic resistance](#).
- Visit the DHS [landing page with antimicrobial stewardship resources](#) for patients and health care professionals.

### Health disparities and HAIs

Read the CDC [Vital Signs report](#) which focuses on health disparities related to hemodialysis-associated *Staphylococcus aureus* (*S. aureus*) bloodstream infections among people receiving dialysis treatment for end-stage kidney disease.

## Workbook Key

### Activity 1: How antimicrobial resistance happens and spreads

1. (a.) \$4.6 billion annually. (b.) Prevent infections related to surgery or placement of medical devices, prevent the spread of germs through infection prevention and control, improve the use of antibiotics and antifungals. (c.) Practice hand hygiene and use PPE. (d.) Enter the body and cause infection through surgical procedures and medical devices like catheters, spread to people from surfaces like bedrails or the hands of health care personnel, move with patients upon transfer from one facility to another or into the community when patients go home. (e.) Fecal waste can contain trace amounts



*of previously consumed antibiotics or antifungals, and antimicrobial-resistant germs. The combination of these drugs and germs allows them to survive in plumbing systems, like toilets. Wastewater can also be inadvertently released into the environment, contributing to antimicrobial resistance in the environment.*

- 2. (a.) Participate in the CDC AR Lab Network by submitting isolates, support local response to prevent spread, support aggressive responses to all unusual resistance, work with local partners and health care facilities to track and prevent healthcare-associated, foodborne, and community infections caused by antimicrobial-resistant germs, use data to improve antibiotic and antifungal use and keep them effective for life-threatening infections, including those that can lead to sepsis, lead or support improvements to antibiotic and antifungal use in people, animals, and plants. (b.) Open interpretation.*

### **Activity 2: MDROs**

- 1. (a.) C. auris, CRE, CRAB, CRPA (b.) C. auris (c.) C. auris. (d.) True. (e.) False. (f.) UTIs, pneumonia, bloodstream infections, intra-abdominal abscesses (g.) True. (h.) Healthcare-associated MRSA and community-associated MRSA. (i.) Pimples or boils on the skin.*
- 2. (a.) Through the hands of health care workers and visitors, through contact with body fluids and via contaminated objects or surfaces. (b.) Yes, someone with an MDRO is able to spread it to others. People at greatest risk of transmission include those with long health care stays, medical devices, recent transplants, and ICU stays. (c.) Practice good hand hygiene: wash hands after touching body fluids, commonly used surfaces, and after visiting patients/residents. Hand hygiene can be done using hand sanitizer or soap and water. Use infection prevention precautions: patients/residents may be placed on special precautions, health care personnel will use PPE, visitors will be advised of steps to take during and after the visit. Clean the environment: keep the room and everything around the patient/resident clean, housekeeping staff should clean the room daily using approved products.*

### **Activity 3: Reportable MDROs in Wisconsin**

- 1. (a.) CP-CRAB, CP-CRE, CP-CRPA, C. auris, VISA/VRSA; Category II. (b.) A person who is infected with an MDRO has the organism in or on their body and it is causing symptoms or illness. It is important to note that people can also be “colonized” with MDROs. A person who is colonized with an MDRO is carrying the organism in or on their body, often for very long periods of time, but it is not causing symptoms or making the person ill. People who are colonized with an MDRO can, however, spread the organism to surfaces in their environment and to other people. An individual who is colonized with an MDRO can also become infected later with the organism. (c.) True. (d.) Confirmed and probable cases of reportable MDROs are automatically sent by WSLH to the Wisconsin Electronic Disease Surveillance System (WEDSS) for local public health follow-up. (e.) Maintaining line lists of residents known to be infected or colonized with MDROs, obtaining swabs of all high-risk residents upon admission to detect colonization or infection with targeted MDROs, performing point prevalence screening to determine the extent of spread of the targeted MDRO within the facility.*
- 2. (a.) CPOs and C. auris, (b.) Screening or clinical. (c.) Collect demographics and exposure info, enter info into WEDSS, look for indicators that the organism was health care-acquired, look into clusters of similar MDROs, connect with the HAI Prevention Program.*

### **Activity 4: Intro to antimicrobial stewardship**

*Open interpretation.*

## Activity 5: Antibiotic prescribing in Wisconsin

(a.) Penicillins, cephalosporins, beta-lactams with increased activity. (b.) Urgent care visits. (c.) Northern. (d.) True. (e.) Target urgent care locations as an area for improvement efforts, continue efforts to eliminate antibiotic prescribing for acute upper respiratory infections per evidence-based guidelines. (f.) Q1 of 2020. (g.) A ranking of neighborhoods by level of socioeconomic disadvantage using factors such as income, education, employment and housing quality.

(h.)

Tier 1 Antibiotics are almost always indicated.	Tier 2 Antibiotics are sometimes indicated.	Tier 3 Antibiotics are never indicated.
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(i.) 32,596. (j.) True.

## Activity 6: Antimicrobial stewardship programs

(a.) Treatment failures, C. diff infections, adverse effects, antibiotic resistance, hospital costs and lengths of stay. (b.) To serve as an adaptable framework that hospitals can use to guide efforts to improve antibiotic prescribing. (b.) Hospital leadership commitment: dedicate necessary human, financial, and information technology resources; Accountability: appoint a leader or co-leaders responsible for program management and outcomes; Pharmacy expertise: appoint a pharmacist to lead implementation efforts to improve antibiotic use; Action: implement interventions, such as audits and feedback, to improve antibiotic use; Tracking: monitor antibiotic prescribing, impact of interventions, and other important outcomes (like C. diff infections and resistance patterns); Reporting: regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, and hospital leadership; Education: educate prescribers, pharmacists, and nurses about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.