

Antibiogram Education Tools for Providers

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This information was compiled by the Vermont Antimicrobial Network (VAN), a statewide collaborative that promotes antimicrobial stewardship practices. Please use this educational guide to help you orient to the antibiogram and how it can maintain the quality of care you deliver to Vermonters.

[Visit our website](#) for more information and to find Vermont hospital antibiograms.

If you need help accessing or understanding this information, contact ahs.vdhhaiepi@vermont.gov.

Background: Using Antibiograms

An antibiogram is a key tool for selecting empiric antibiotic therapy. Use your facility's or local hospital's antibiogram whenever possible to choose antibiotics that are most likely to be effective based on local resistance patterns.

How to Use Your Facility's Antibiogram

1. Identify the likely pathogen
2. Choose antibiotics with high susceptibility; aim for $\geq 80-90\%$
3. Consider patient-specific factors like infection site, patient allergies, kidney function, recent antibiotic use, and severity of illness
4. Reassess when culture results return; narrow therapy or change treatment, as needed

Use an antibiogram when:

- Selecting empiric therapy before culture results are available
- Treating common infections (e.g., UTI, pneumonia, skin/soft tissue, bloodstream infections)
- Supporting antimicrobial stewardship and avoiding unnecessary broad-spectrum antibiotics

When not to use an antibiogram:

- After patient-specific culture and susceptibility results are available
- For unusual pathogens or complex infections where individualized guidance is needed



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Simple Clinical Example

A patient presents with symptoms of a UTI, and the culture results will take 48 hours.

1. Identify likely organism: *E. coli*
2. Check local susceptibilities
 1. Nitrofurantoin: 94% (preferred)
 2. TMP-SMX: 78% (consider alternatives)
 3. Ciprofloxacin: 61% (avoid)
3. Choose empiric therapy: **Nitrofurantoin**
4. Reassess when culture/sensitivity returns

Student Quiz: Antibiogram Knowledge Check

Multiple Choice

1. What is the primary purpose of an antibiogram?
 - A. Identify the exact bacteria causing an infection
 - B. Guide empiric antibiotic selection
 - C. Determine patient allergies
 - D. Replace culture and sensitivity testing
2. What is generally considered an acceptable antibiotic susceptibility percentage for empiric therapy?
 - A. 20–40%
 - B. 50–60%
 - C. 70–80%
 - D. 80–90%
3. Which of the following is NOT a good use of an antibiogram?
 - A. Selecting antibiotics before culture results return
 - B. Updating hospital antibiotic guidelines
 - C. Choosing therapy after you have susceptibility results
 - D. Supporting antimicrobial stewardship
4. What is the best empiric choice if *E. coli* shows these susceptibilities: cefazolin 88%, TMP-SMX 63%, ciprofloxacin 59%?
 - A. TMP-SMX
 - B. Ciprofloxacin
 - C. Cefazolin
 - D. Any of the above

True / False

5. An antibiogram is specific to a hospital or community. True or False?
6. An antibiogram can tell you exactly which antibiotic will work for an individual patient. True or False?
7. Susceptibility percentages indicate the proportion of isolates sensitive to a drug. True or False?

8. The antibiogram should be consulted even after personalized culture results are available. True or False?

Short Answer

9. Name two clinical situations where using an antibiogram is appropriate.

10. Describe why a drug with 45% susceptibility should not be chosen empirically.

Clinical Case Worksheet

Clinical Case: Using an Antibigram to Select Empiric Antibiotics

Patient Presentation

A 32-year-old woman presents with:

- Dysuria
- Urinary urgency
- Lower abdominal discomfort
- No fever, flank pain, or systemic symptoms

Past medical history: Healthy, no allergies, no recent antibiotic use

Urinalysis

Leukocyte esterase: positive

Nitrites: positive

WBCs: elevated

Culture pending (48–72 hours)

Local Hospital Antibigram (Extract: *E. coli*)

Antibiotic	% Susceptible
Nitrofurantoin	95%
TMP-SMX	72%
Ciprofloxacin	58%
Fosfomycin	90%
Cefazolin	88%

Worksheet Questions

1. What organism is most likely causing this patient's infection?

2. Which antibiotics have >85% susceptibility? List all that meet the criteria.
3. Which antibiotic is the BEST empiric choice for this patient? Explain your reasoning.
4. Why is ciprofloxacin not a good empiric choice here?
5. What patient-specific factors support or limit the chosen antibiotic?
6. Once the urine culture and sensitivity return, what should the clinician do? Choose one:
 - a. Continue same antibiotic
 - b. Narrow therapy
 - c. Stop therapy
 - d. Change to a different agent
7. Explain why antibiograms cannot replace culture and sensitivity testing.

Answer Key: Quiz

Multiple Choice

1. B – Guide empiric antibiotic selection
2. D – 80-90%
3. C – Choosing therapy after specific susceptibility results
4. C – Cefazolin

True / False

5. True – Antibiograms are specific to a hospital/region
6. False – They cannot predict an individual patient's exact response
7. True – Susceptibility % reflects proportion of isolates sensitive to a drug
8. False – Once culture results return, those override the antibiogram

Short Answer

9. Examples of appropriate situations: Choosing empiric therapy for UTIs, pneumonia, SSTIs, sepsis; Developing hospital antibiotic guidelines; Supporting antimicrobial stewardship decisions; Comparing local resistance trends
10. Reason low susceptibility (<50%) should not be used empirically: Low percentage means most local isolates are resistant; High risk of treatment failure; Empiric therapy should cover the majority of likely pathogens