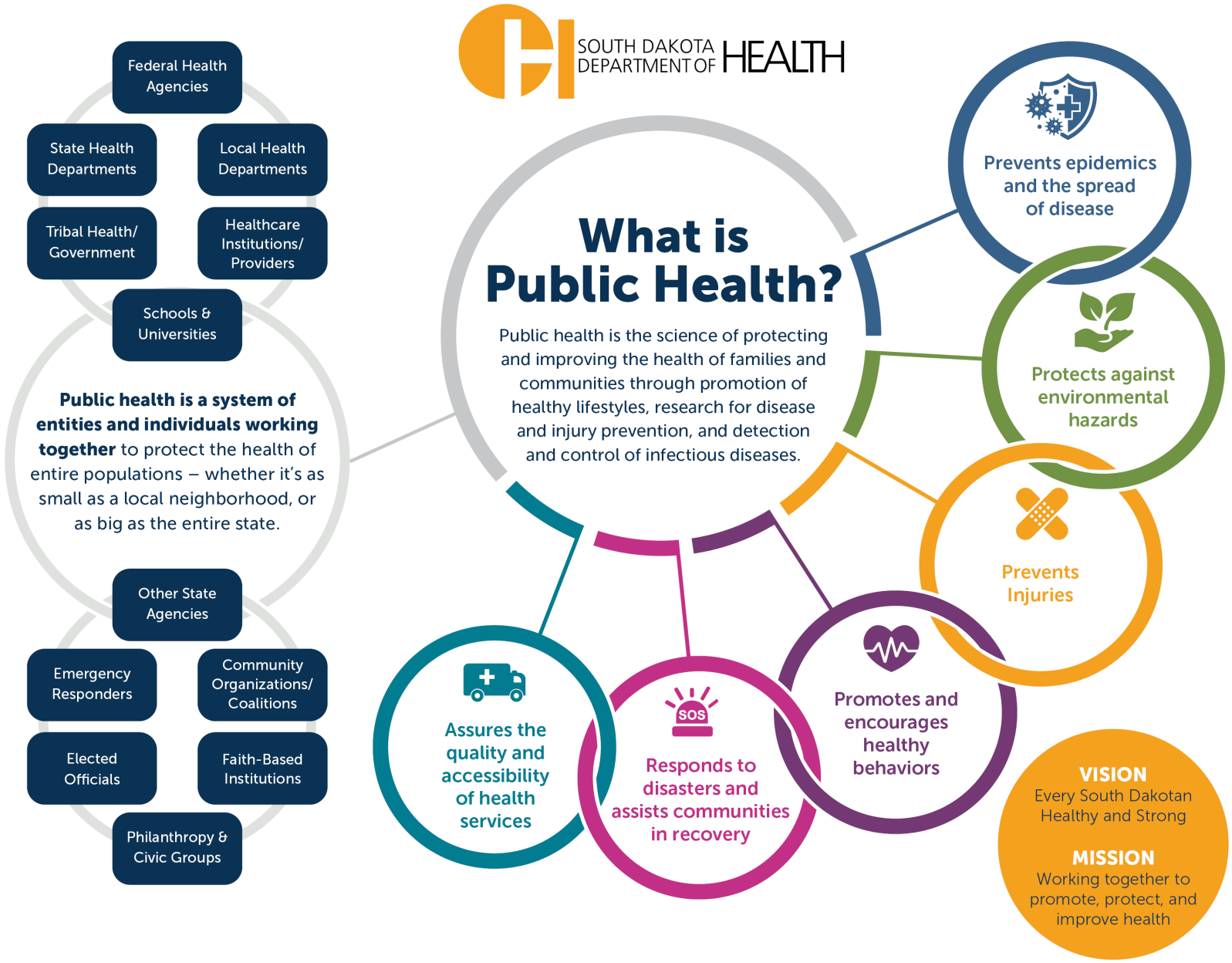
South Dakota Department of Health

From Lab to Bedside:

Interpreting Microbiology Reports and Antibiogram with Confidence

July 9, 2026

Hosted by South Dakota Department of Health Healthcare Associated Infections and Antibiotic Resistance Program


SOUTH DAKOTA DEPARTMENT OF HEALTH
Federal Health Agencies
State Health Departments
Local Health Departments
Tribal Health/ Government
Healthcare Institutions/ Providers
Schools & Universities
Public health is a system of entities and individuals working together to protect the health of entire populations – whether it's as small as a local neighborhood, or as big as the entire state.
Other State Agencies
Emergency Responders
Community Organizations/ Coalitions
Elected Officials
Faith-Based Institutions
Philanthropy & Civic Groups
What is Public Health?
Public health is the science of protecting and improving the health of families and communities through promotion of healthy lifestyles, research for disease and injury prevention, and detection and control of infectious diseases.
Prevents epidemics and the spread of disease
Protects against environmental hazards
Prevents Injuries
Promotes and encourages healthy behaviors
Responds to disasters and assists communities in recovery
SOS
Assures the quality and accessibility of health services
VISION
Every South Dakotan Healthy and Strong
MISSION
Working together to promote, protect, and improve health

Join the...

South Dakota Antibiotic Stewardship

SOUTH DAKOTA DEPARTMENT OF HEALTH

WORKGROUP KICKOFF

Building partnerships to advance antibiotic stewardship and combat antimicrobial resistance in South Dakota.

Thursday,
July 23, 2026

Time
1:00 - 3:00 PM

Holiday Inn Express,
Fort Pierre

FEATURED EDUCATIONAL TOPICS

Build foundational knowledge of Carbapenemase-Producing Organisms (CPOs).

Learn how laboratory tools such as mCIM and Carba-R testing support detection and response efforts.

- Statewide Updates from the Department of Health and Keegan Mason And Associates.
- Stewardship initiatives and resources
- Brief data highlights
- Learn from the Lab- mCIM and Carba-R testing
- Facility Spotlight- Stewardship In Action- Madison Regional Hospital
- Tour the new South Dakota Public Health Laboratory

KMA
Keegan Mason & Associates

JAMES M. KEEGAN, MD

RANDEE MASON, RN, BSN, CPHQ

From Lab to Bedside:
Interpreting Microbiology Reports and Antibiograms with Confidence

Keegan Mason & Associates, LLC

Objectives

1. Understand how to use an antibiogram
2. Review key stewardship principles
3. Identify common vs uncommon pathogens
4. Apply concepts to clinical decision-making

What is an Antibiogram?

2025 (2024) Antibiogram Comparison

Antimicrobial Stewardship Program

(2024)	# Isolates	Ampicillin/ Amoxicillin (AM)	Cefazolin/ Cephalexin (CFZ)	Ceftriaxone/ Cefdinir (CAX)	Bactrim (T/S)	Nitrofurantoin (FD)	Gentamicin (GM)	Ceftazadime (CAZ)	Ciprofloxacin (CP)	Levofloxacin (LVX)
E. coli	197 (253)	58% (55%)	90% (86%)	94% (94%)	76% (75%)	97% (99%)	89% (94%)	95% (95%)	80% (76%)	80% (77%)
K. pneumoniae	40 (40)	8% (5%)	95% (90%)	95% (90%)	98% (80%)	82% (75%)	92% (95%)	95% (90%)	100% (98%)	100% (100%)
P. mirabilis	15 (9)	80% (89%)	79% (89%)	80% (89%)	87% (89%)	8% (20%)	87% (89%)	87% (89%)	87% (78%)	87% (100%)
P. aeruginosa	14 (11)	-	-	-	-	-	79% (73%)	100% (91%)	86% (91%)	86% (91%)

Antibiogram for Gram Positive Organisms

	# Isolates	Oxacillin (OX)	Cefazolin/ Cephalexin (CFZ)	Augmentin (AUG)	Ampicillin (AM)	Doxycycline (TE)	Clindamycin (CD)	Bactrim (T/S)	Vancomycin (VA)
S. aureus	48 (46)	98% (91%)	98% (91%)	98% (91%)	0% (0%)	96% (98%)	92% (84%)	100% (100%)	100% (100%)
MRSA	44 (56)	-	-	-	-	93% (89%)	79% (88%)	100% (98%)	100% (98%)
E. faecalis	21 (16)	-	-	-	100% (100%)	33%	-	-	100% (100%)

Local Antibiogram

- Site-specific antibiogram data (if available)
- Key numbers and trends
- Importance of including local data

2025 (2024) Antibiogram Comparison

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Literature Support

ICHE, Vol. 47 (March 2026), pp. 311–317

Lead Author: Taylor

Authors: Robin Jump, Christopher Crnich

Key takeaway(s) supporting stewardship/antibiogram use

Alternatives to Local Antibiogram

- **Use closest regional antibiogram if local unavailable**
- Referral center antibiogram as an option
- Especially useful for:
  - Unusual organisms
  - Low-frequency isolates

Antibiogram Utility

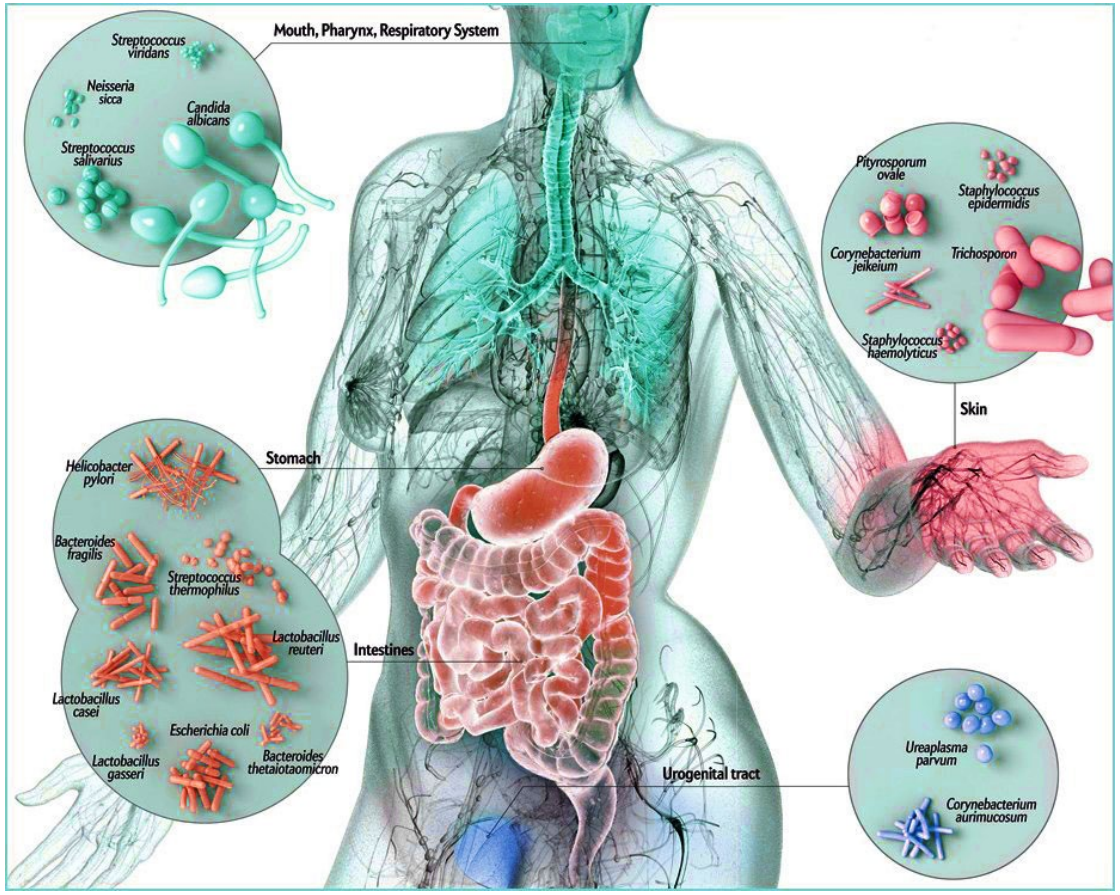
- **MRSA % calculation**:
  - MRSA / Total *Staph aureus* isolates

- **Clinical relevance**:
  - Helps guide empiric therapy decisions

- **Stewardship insight**:
  - MRSA rates decrease when levofloxacin is avoided
  - Levofloxacin associated with ↑ MRSA risk (~5x)

C. difficile Considerations

- Include C. difficile cases as a footnote in data
- Risk decreases with avoidance of certain antibiotics
- Key point:
  - Avoid unnecessary antibiotics with anaerobic activity
- Always assess:
  - Toxin testing
  - Infection vs colonization

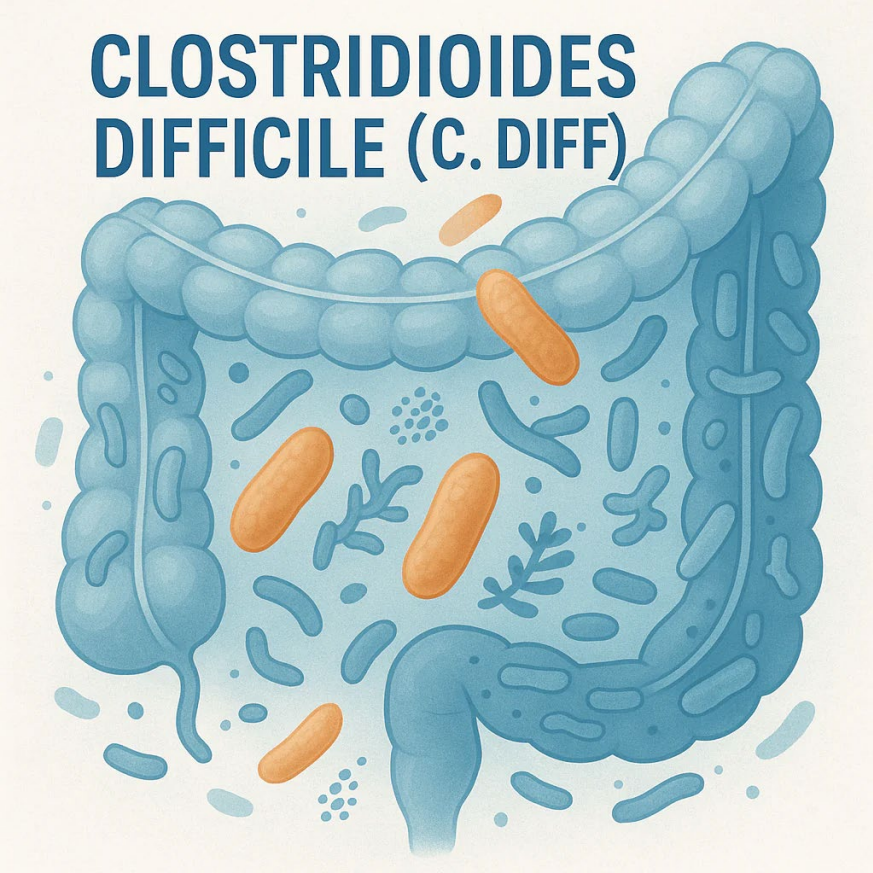


C. Difficile Pathophysiology

Overview of infection process

Colonization vs infection:

- Key differences
- Clinical implications



Antibiotics with Anaerobic Activity

Commonly used agents:

- Levofloxacin
- Meropenem
- Ertapenem
- Piperacillin-tazobactam (Zosyn)
- Amoxicillin-clavulanate (Augmentin)
- Ampicillin-sulbactam (Unasyn)
- Clindamycin

Effective Stewardship Strategy

Avoid unnecessary broad-spectrum antibiotics

C. difficile = #1 nosocomial infection in the U.S.

Focus on:

- Targeted therapy
- Antibiotic de-escalation

Interpreting an Antibiogram

- Example: Completed antibiogram
- Common findings:
  - Gram-negative organisms often sensitive
- Examples:
  - *E. coli*, *Klebsiella*, *Proteus*
- Less common:
  - *Enterobacter*, *Pseudomonas*

Uncomplicated Cystitis Treatment

Drug	Duration Studied
Nitrofurantoin	**5 days**
TMP/SMX	**3 days**
Cephalexin	7 days
Cefpodoxime	3 days
Cefdinir	5 days

***Most patients can be treated for 3–5 days*.**

- Back up treatment options: Ciprofloxacin and Fosfomycin

Urine Culture Results and Sensitivities in Rural Areas

- 90% of positive urine cultures are E. coli
- Sensitivities
  - Nitrofurantoin 98%
  - Keflex 95%
  - TMP/SMP 95%

Microbiology Considerations

Interpreting Positive Cultures

- Consider normal flora:
  - Skin
  - GI tract (including oral cavity)
  - Vagina
  - Lung
  - Lower GU tract

Common Pathogens

- *Staphylococcus aureus*
- *Streptococcus* (Group A & B)
- *Enterococcus* (Group D streptococci)
- Gram-negative organisms:
  - *E. coli*, *Klebsiella*, *Proteus*
- Less common:
  - *Pseudomonas*

Targeted Antibiotic Therapy

Match organism to narrow-spectrum therapy

Emphasize:

- De-escalation
- Avoiding unnecessary broad coverage

Uncommon Pathogens/Contaminants

Staphylococcus epidermidis

Lactobacillus

Often represent contamination rather than infection

Uncertain Pathogenicity

- Non-*faecalis* / *faecium* Enterococci
- Clinical significance may vary
- Requires clinical correlation

Emergency Pathogens

Neisseria meningitidis

Example:

- UK (Leeds) outbreak
- March 2026: ~20 cases

Key Takeaways

- Antibiograms are important to reinforce successful antibiotic stewardship strategies
- Common pathogens are common
- Important to consider contamination and normal flora
- Avoid empiric broad-spectrum antibiotics unless patient is in critical condition
- Protect the microbiome and preserve antibiotic effectiveness

Reminders:

Our next webinar: **November 19, 2026, 12-1 pm CST**

Title: Pneumonia 2026: Avoiding Overdiagnosis and Overtreatment

Reminders:

APIC SOUTH DAKOTA

2026 Annual Conference: October 1 & 2 Rapid City
Register: https://reg.eventmobi.com/apic-south-dakota-annual-conference

Antibiotic Stewardship Workgroup: September 30, 2026- Rapid City

USA Antibiotic Awareness Week November 13-19, 2026,

HAI/AR webinar: November 19, 2026, 12-1 pm CST
Title: Pneumonia 2026: Avoiding Overdiagnosis and Overtreatment

Past Webinars: https://doh.sd.gov/topics/diseases/disease-prevention-services/healthcare-associated-infections/hai-training-resources/

Questions?

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Please complete the evaluation!

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This presentation has been approved through the Certification Board of Infection Control and Epidemiology (CBIC) for 1 hour of IPU's.

To receive the IPU's, you must complete and submit the evaluation.

A certificate will be emailed to you.

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