



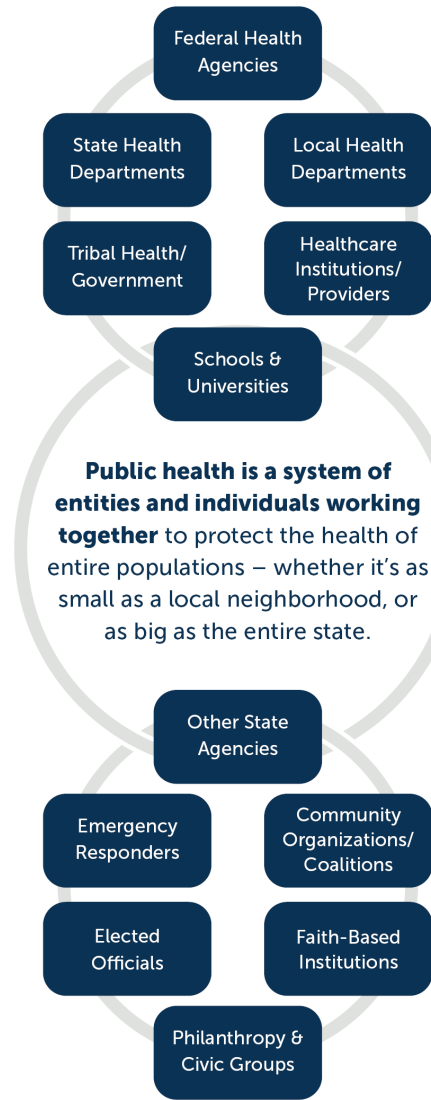
South Dakota Department of Health

From Lab to Bedside:

Interpreting Microbiology Reports and Antibigram with Confidence

July 9, 2026

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



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.



Join the ...



South Dakota Antibiotic Stewardship

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





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)
<i>E. coli</i>	197 (253)	58% (55%)	90% (86%)	94% (94%)	76% (75%)	97% (99%)	89% (94%)	95% (95%)	80% (76%)	80% (77%)
<i>K. pneumoniae</i>	40 (40)	8% (5%)	95% (90%)	95% (90%)	98% (80%)	82% (75%)	92% (95%)	95% (90%)	100% (98%)	100% (100%)
<i>P. mirabilis</i>	15 (9)	80% (89%)	79% (89%)	80% (89%)	87% (89%)	8% (20%)	87% (89%)	87% (89%)	87% (78%)	87% (100%)
<i>P. aeruginosa</i>	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)
<i>S. aureus</i>	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%)
<i>E. faecalis</i>	21 (16)	-	-	-	100% (100%)	33%	-	-	100% (100%)



Local Antibigram

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

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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 Antibigram

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



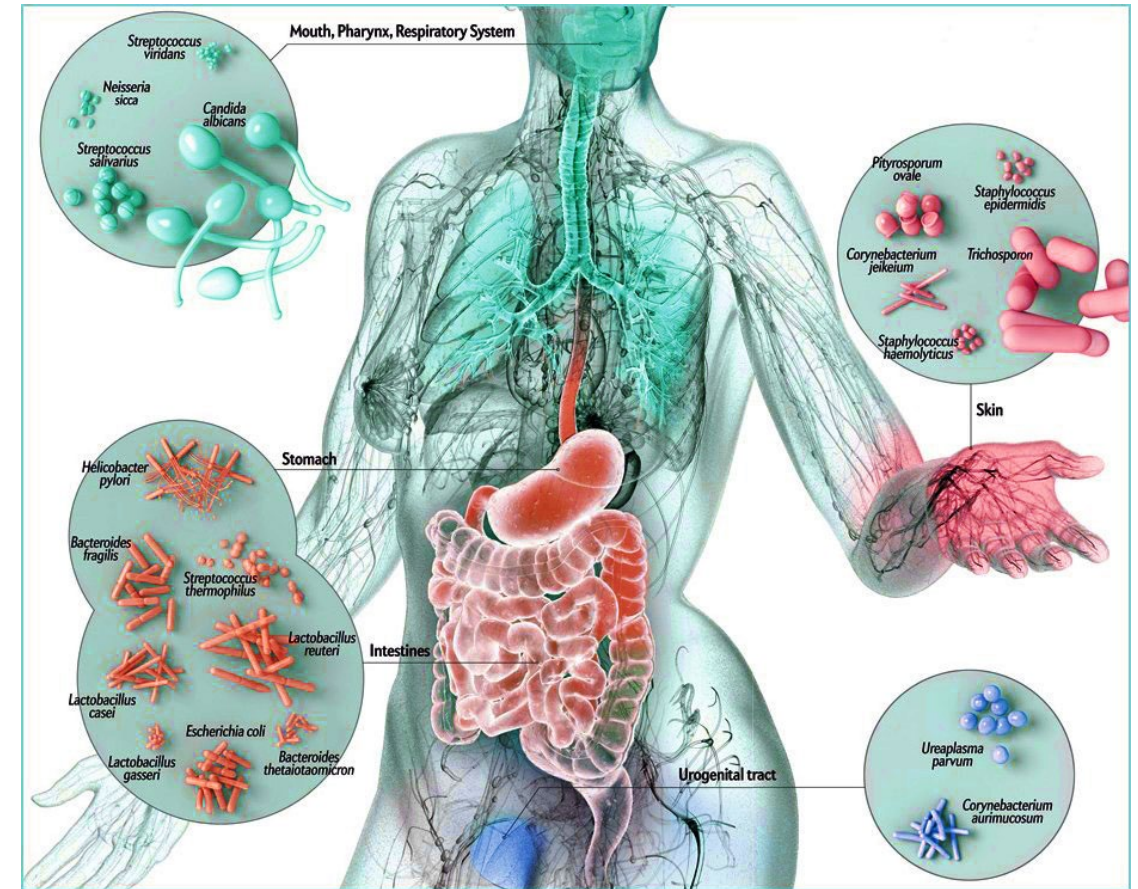
Antibiogram Utility

- **MRSA % calculation:**
 - $\text{MRSA} / \text{Total } Staph \text{ aureus isolates}$
- **Clinical relevance:**
 - Helps guide empiric therapy decisions
- **Stewardship insight:**
 - MRSA rates decrease when levofloxacin is avoided
 - Levofloxacin associated with \uparrow 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

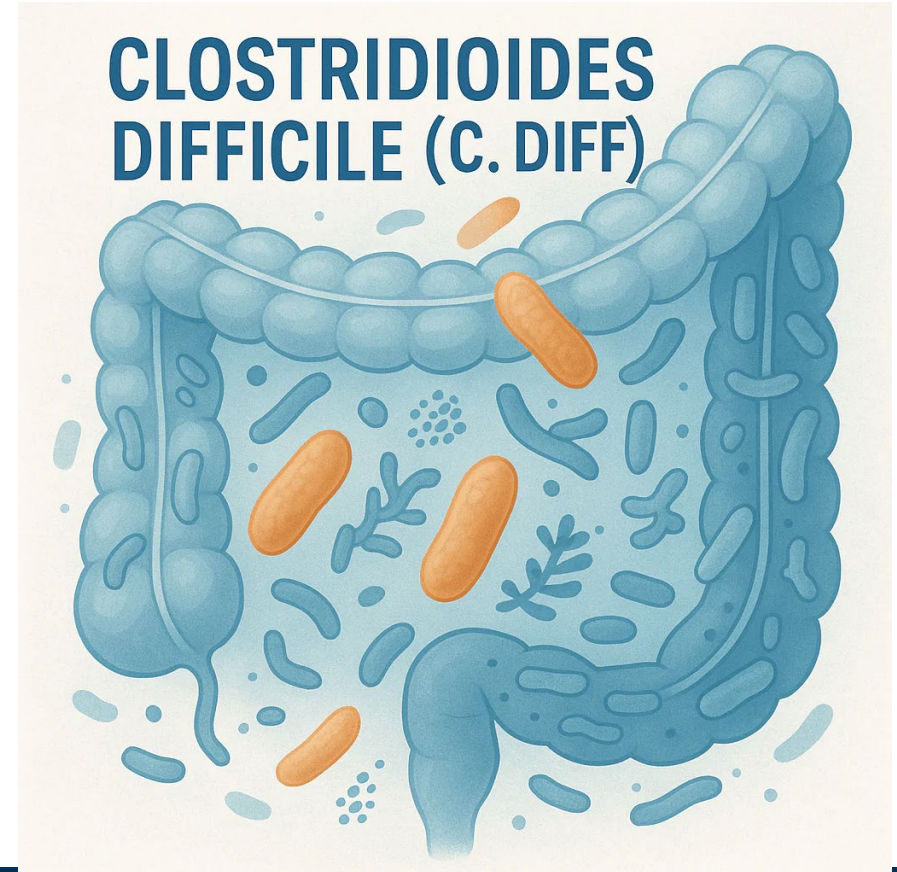


C. Difficile Pathophysiology

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

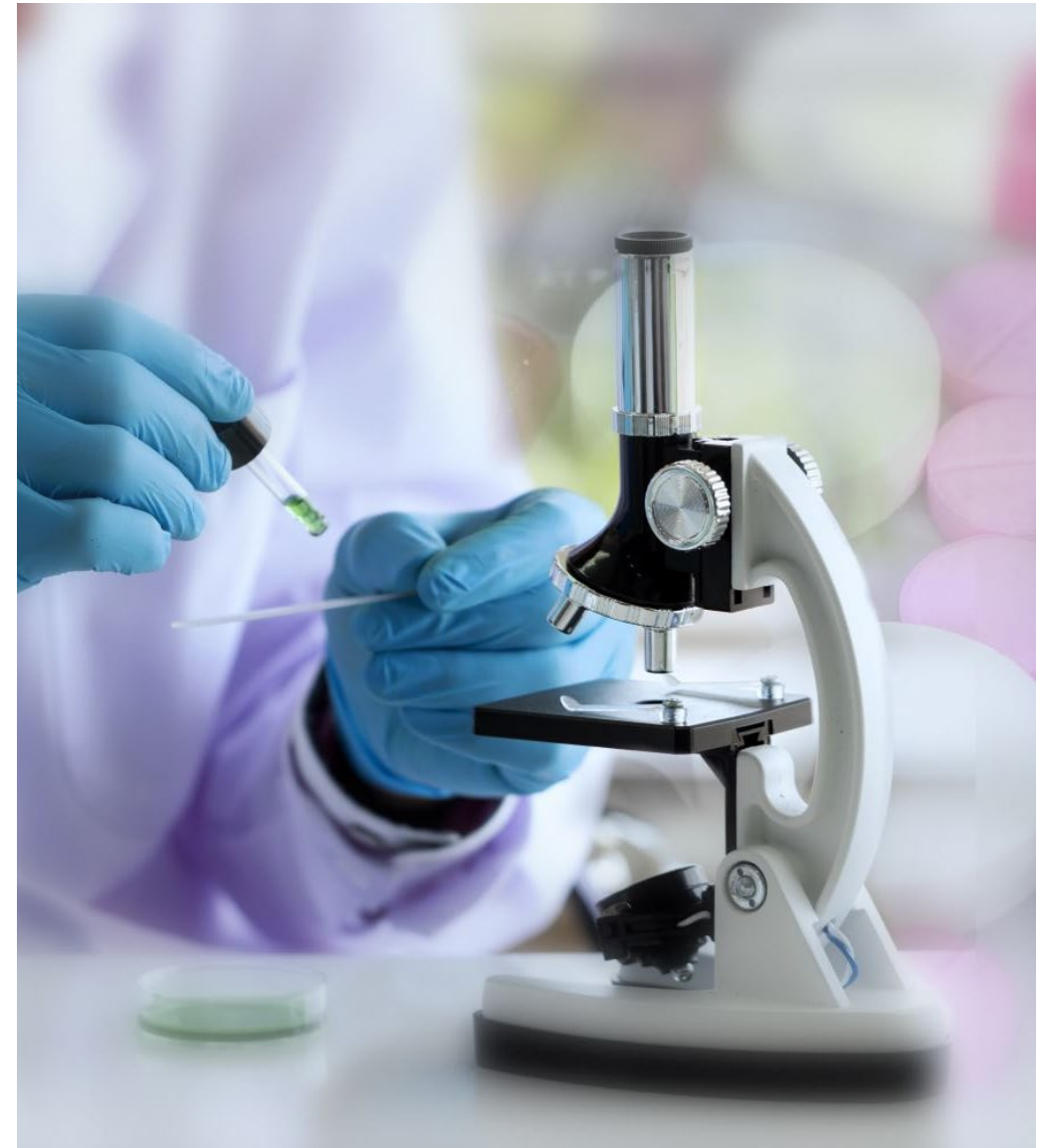
- 90% of positive urine cultures are E. coli
- Sensitivities
 - Nitrofurantoin 98%
 - Keflex 95%
 - TMP/SMP 95%



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:

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

Title: Pneumonia 2026: Avoiding Overdiagnosis and Overtreatment



Reminders:



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!

<https://forms.office.com/g/07f3fqJpzr>

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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