The Big 3 of Long-Term Care

Juan Teran, MD
Medical Director, Nebraska ICAP

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NEBRASKA INFECTION CONTROL ASSESSMENT AND PROMOTION PROGRAM

Disclosures

I have no conflicts of interests to disclose

Objectives

- Evaluate the impact of antibiotic stewardship interventions for UTI, Respiratory infections, and Skin and soft tissue infections
- Apply evidence-based interventions to improve decisions regarding antibiotic treatment
- Collaborate effectively with health care professionals across disciplines to strengthen stewardship initiatives

Urinary Tract Infection - UTI

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Clinical Scenario

You are a newly hired Infection Preventionist at a 50-bed skilled nursing facility. Compared to your prior job, you've observed some gaps in antimicrobial stewardship at this facility:

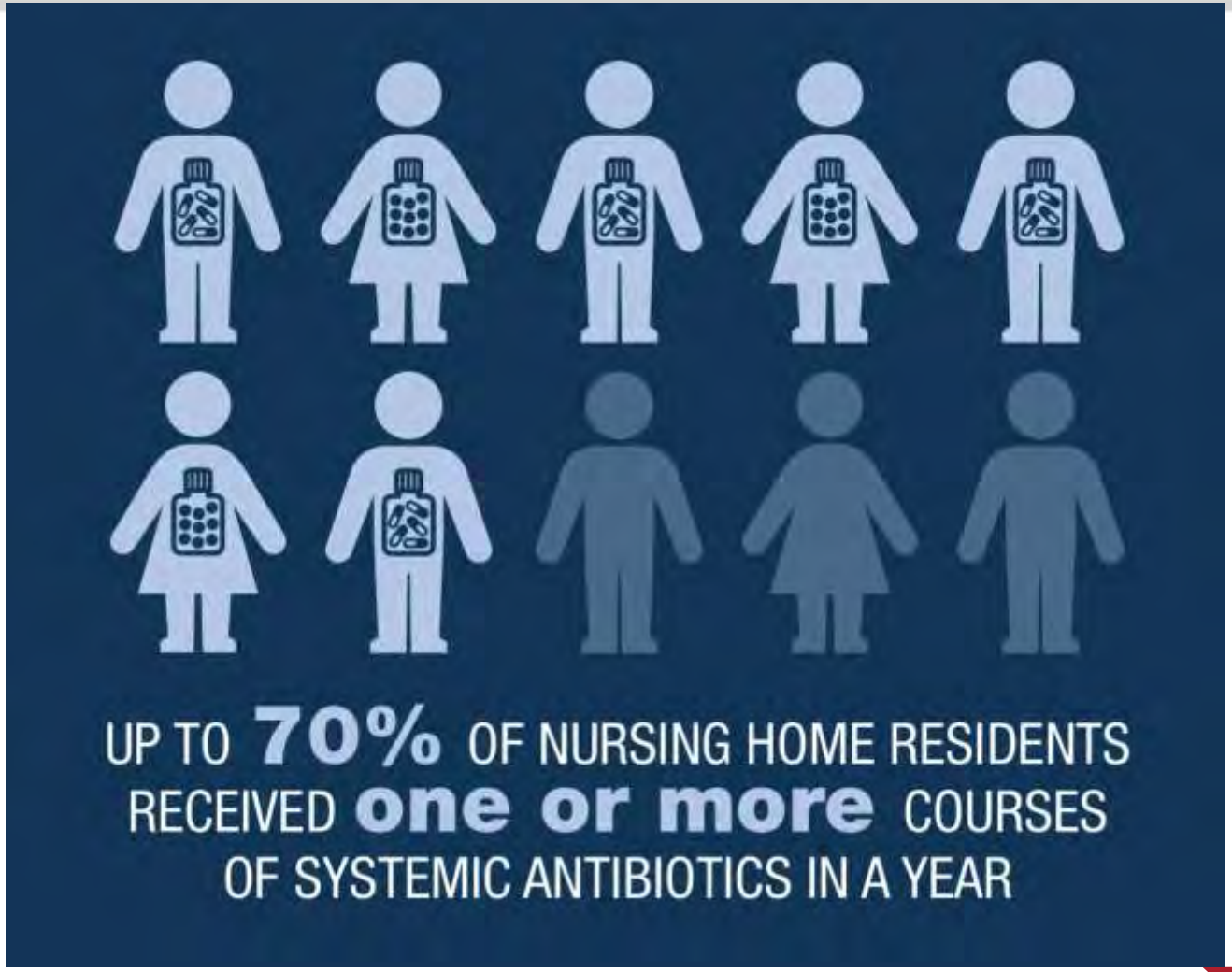
- No written statement of support from leadership for an antimicrobial stewardship program (ASP).
- No dedicated full-time equivalent (FTE) for staff assigned to stewardship activities.
- The only current stewardship-related practice is that a consultant pharmacist conducts antibiotic time-outs.

Recognizing these gaps, you want to schedule a meeting with facility leadership to advocate for implementing a formal ASP.

How can you effectively make your case?

New nursing home. Mike Coates. CC0 1.0

Why Does it Matter?



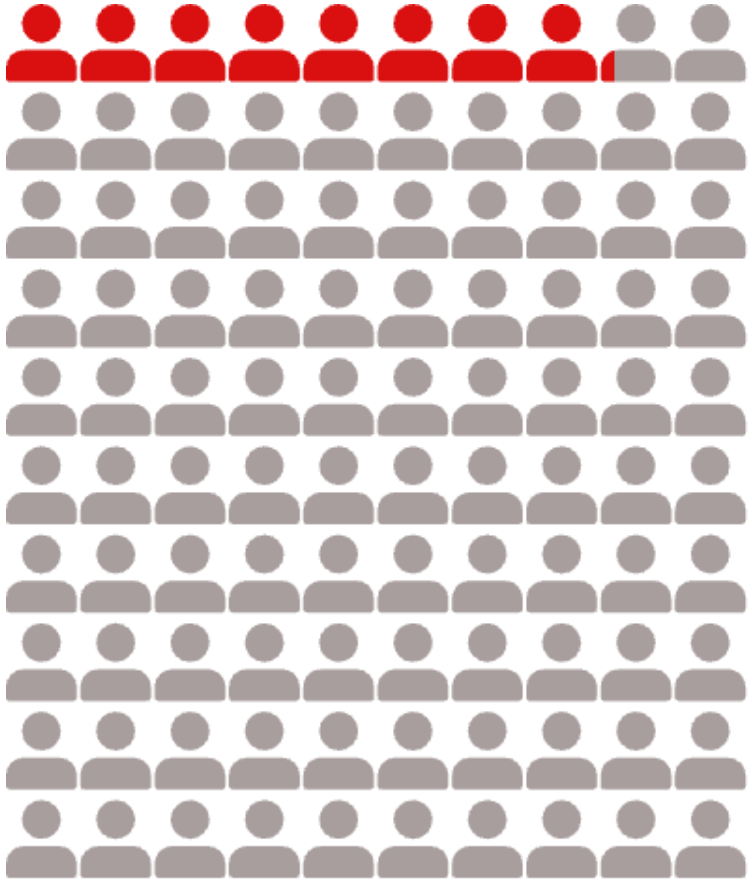
CDC. The Core Elements of Antibiotic Stewardship for Nursing Homes. Atlanta, GA: US Department of Health and Human Services, CDC; 2015

Point Prevalence Survey – 8.2/100 Residents are Receiving Antibiotics

10 States

161 Nursing Homes

15,276 Residents



Thompson et al. Antimicrobial Use in a Cohort of US Nursing Homes, 2017. *JAMA.* 2021;325(13):1286–1295.

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Those with Recent Admission, Short Stay, and Devices Have Higher Odds of Receiving Antibiotics

Table 2. Adjusted Odds Ratio From Multivariable Logistic Regression for Antimicrobial Use in Nursing Home Residents, Including 15 276 Residents With 1258 Receiving at Least 1 Antimicrobial[a]

Characteristic	Adjusted OR (95% CI)	*P* value
Age, y		
≥85	1 [Reference]	
65 to 84	1.3 (1.1-1.5)	.002
<65	1.5 (1.2-1.8)	<.001
Race/ethnicity[b]		
White non-Hispanic	1 [Reference]	
Other	0.8 (0.7-1.0)	.05
Black Non-Hispanic	0.7 (0.6-0.9)	.003
Unknown or missing	0.7 (0.6-1.0)	.09
Diabetes		
No	1 [Reference]	
Yes	1.4 (1.2-1.6)	<.001
Resident type[c]		
Long stay		
Short stay	1.4 (1.2-1.7)	<.001
Central venous catheter		
No	1 [Reference]	
Yes	11.1 (8.5-14.5)	<.001
Any urinary catheter		
No	1 [Reference]	
Yes[d]	2.2 (1.8-2.6)	<.001
Wound care		
No	1 [Reference]	
Yes	1.8 (1.5-2.0)	<.001
Days from nursing home admission to survey date		
>365	1 [Reference]	
100-365	1.5 (1.2-1.8)	<.001
31-99	2.0 (1.6-2.5)	<.001
≤30	3.0 (2.4-3.7)	<.001
Nursing home location[e]		
Metropolitan area	1 [Reference]	
Nonmetropolitan area	1.4 (1.1-1.7)	.007

Thompson et al. Antimicrobial Use in a Cohort of US Nursing Homes, 2017. *JAMA.* 2021;325(13):1286–1295.

The Big 3 of LTC – Prophylaxis is Common

Table 3. Antimicrobials Used by Site of Infection for Treatment of Active Infection or Medical Prophylaxis[a]

Site of infection	Antimicrobials, No. (%)	
	Treatment of active infection (n = 1120)[b]	Medical prophylaxis (n = 262)[b]
Urinary tract	315 (28.1)	107 (40.8)
Skin or wound	264 (23.6)	36 (13.7)
Respiratory tract	189 (16.9)	28 (10.7)
Bone or joint	133 (10.1)	27 (10.3)
Gastrointestinal tract	88 (7.9)	Not applicable

[a] More than 1 site of infection could be documented for an antimicrobial.

[b] For treatment of active infection, the value indicates 77.0% of the total, and for medical prophylaxis, 18.0%

Thompson et al. Antimicrobial Use in a Cohort of US Nursing Homes, 2017. *JAMA.* 2021;325(13):1286–1295.

Antibiotics: Acute Care to LTC

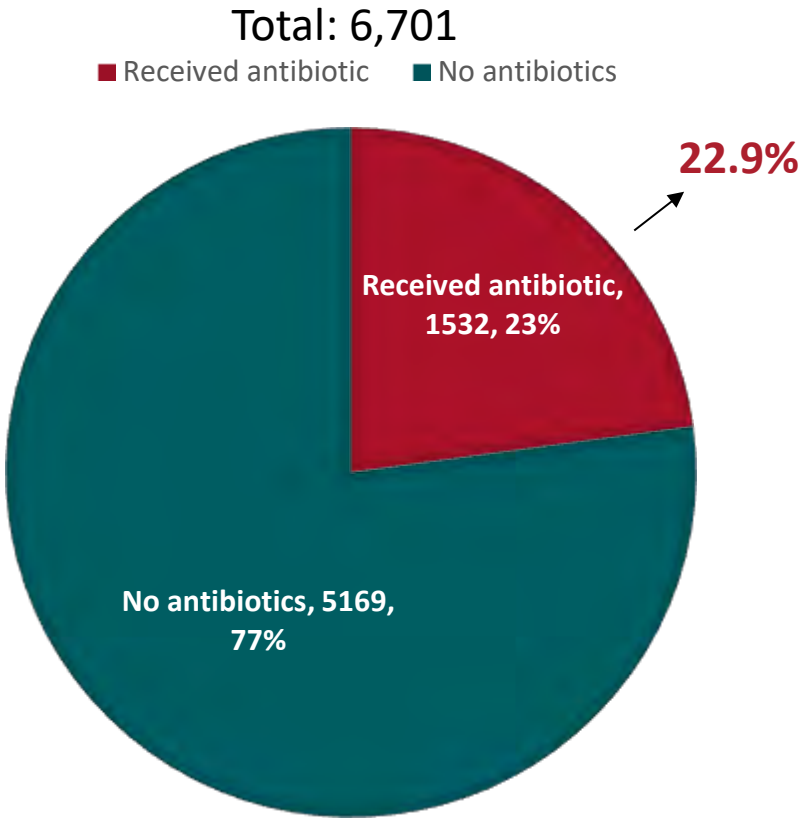

Table 2. Distribution of Antibiotic Classes Prescribed on Discharge to a Long-Term Care Facility (n = 1,906)

Antibiotic Class	No. (%)
Cephalosporins	389 (20.4)
First generation	139 (35.7)
Second generation	7 (1.8)
Third generation	212 (54.5)
Fourth generation	20 (5.1)
Fifth generation	11 (2.8)
Fluoroquinolones	364 (19.1)
Penicillins	318 (16.7)

Weber et al. Infect Control Hosp Epidemiol. 2019;40(1):18-23

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Your Own Data

- Point Prevalence
- Antibiotics Starts
- Days of Therapy
- Average Duration of Therapy
- Provider-level Data
- Benchmarking

Clinical Scenario

Your meeting with leadership went great. Leadership was concerned by how often antibiotics are prescribed, and how frequently they are used inappropriately. They asked how the facility can improve the diagnosis of UTI and suggested implementing a standardized communication tool such as SBAR (Situation, Background, Assessment, Recommendation).

CDC Phil. Public Domain

Several options were discussed during the meeting. Which of the following would you recommend?

a) Use an SBAR format based on McGeer Criteria for UTI diagnosis
b) Use an SBAR format based on Loeb's Minimum Criteria for initiating antibiotics
c) Allow providers to use their own clinical criteria but require documentation in the medical record
d) I'm not sure what the difference is between A and B

Loeb vs McGeer

- Loeb Minimum Criteria for Initiating Antibiotics
  - Clinical criteria are meant to inform decisions on individual patients when care is needed
  - When these criteria are used for clinical decision making (e.g., to start an antibiotic), clinical information (e.g., diagnostic test results, condition duration) is often unknown.
  - When criteria are met, there is reasonable expectation that the resident has an infection
- McGeer Criteria
  - Surveillance criteria are used to count true case events (i.e., diagnosed infections) and to estimate the actual incidence/prevalence of disease conditions
  - These criteria are applied retrospectively (after the fact), often with new information (e.g., diagnostic culture results, which can take days to receive) that was not available during initial clinical assessment

McGeer Criteria

Table 2. Urinary Tract Infection (UTI) Surveillance Definitions

Syndrome	Criteria	Selected Comments*
UTI without indwelling catheter	***Must fulfill both 1 AND 2.*** □ 1. At least one of the following sign or symptom □ Acute dysuria or pain, swelling, or tenderness of testes, epididymis, or prostate □ Fever or leukocytosis, and ≥ 1 of the following: □ Acute costovertebral angle pain or tenderness □ Suprapubic pain □ Gross hematuria □ New or marked increase in incontinence □ New or marked increase in urgency □ New or marked increase in frequency □ If no fever or leukocytosis, then ≥ 2 of the following: □ Suprapubic pain □ Gross hematuria □ New or marked increase in incontinence □ New or marked increase in urgency □ New or marked increase in frequency □ 2. At least one of the following microbiologic criteria □ ≥ 10^5 cfu/mL of no more than 2 species of organisms in a voided urine sample □ ≥ 10^2 cfu/mL of any organism(s) in a specimen collected by an in-and-out catheter	The following 2 comments apply to both UTI with or without catheter: • UTI can be diagnosed without localizing symptoms if a blood isolate is the same as the organism isolated from urine and there is no alternate site of infection • In the absence of a clear alternate source of infection, fever or rigors with a positive urine culture result in the non-catheterized resident or acute confusion in the catheterized resident will often be treated as UTI. However, evidence suggests that most of these episodes are likely not due to infection of a urinary source. • Urine specimens for culture should be processed as soon as possible, preferably within 1-2 h • If urine specimens cannot be processed within 30 min of collection, they should be refrigerated and used for culture within 24 h

https://www.pharmacy.umaryland.edu/media/SOP/wwwpharmacyumarylandedu/centers/lamy/antimicrobial-stewardship/mcgeer-criteria-for-infection-surveillance-checklist_form.pdf

Loeb's Minimum Criteria

For Residents Without a Urinary Catheter

- ☐ Dysuria

OR

- ☐ Fever (>100°F or >2°F above baseline)

AND at least one of the following symptoms that is new or worsening:

- ☐ Urgency
- ☐ Frequency
- ☐ Suprapubic pain
- ☐ Gross hematuria
- ☐ Costovertebral angle tenderness
- ☐ Urinary incontinence

For Residents With a Urinary Catheter or if Nonverbal

One or more of the following ***without another recognized cause***:

- ☐ Fever (>100°F or a 2°F increase from baseline)
- ☐ New costovertebral angle tenderness
- ☐ Rigors
- ☐ New-onset delirium*

**If adequate workup for other causes of delirium has been performed and no other cause for delirium is identified*

Assessment and Management of the Resident With a Suspected Urinary Tract Infection. Content last reviewed June 2021. Agency for Healthcare Research and Quality, Rockville, MD.

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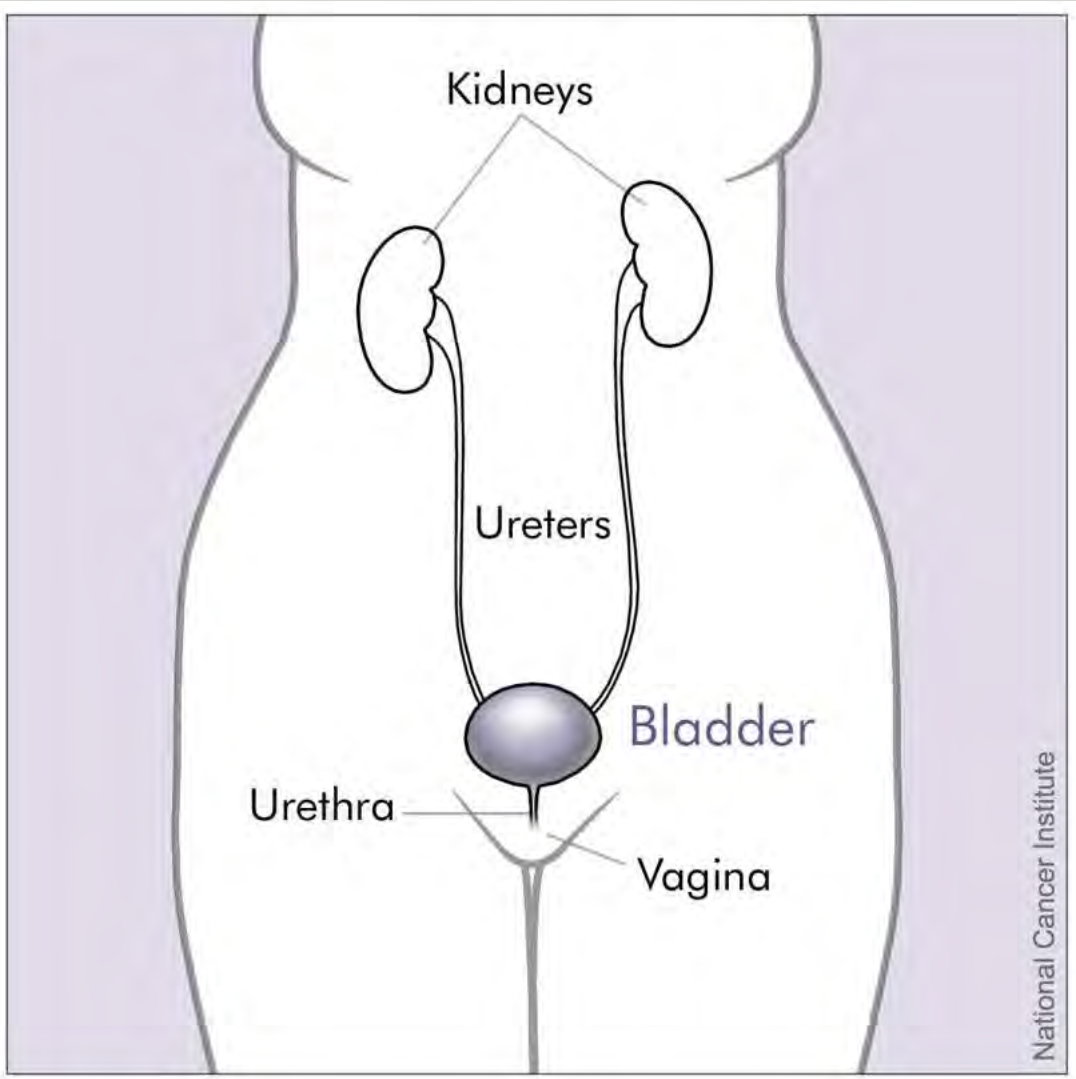
NO CATHETER

CATHETER

Fever/Rigors
Delirium*

CVA
Tenderness/Flank
Pain

Hematuria
Frequency/Urgency
Dysuria
Suprapubic pain
Incontinence



National Cancer Institute. NIH Medical Arts. Public Domain

Fever/Rigors
Delirium*

CVA
Tenderness/Flank
Pain

Suprapubic pain

*Without an alternative explanation

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Do's and Do Not's Pocket Card – Cont.

- ☐ Send a urinalysis (UA) & urine culture (UCx)
- ☐ Increase hydration
- ☐ Start antibiotics before UA and UCx results, if resident appears ill
- ☐ If UA & UCx are positive and the resident has ongoing UTI symptoms, modify antibiotics or start antibiotics (if not receiving active antibiotics)

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Do's and Do Not's Pocket Card – Cont.

Do NOT Send a Urinalysis and Urine Culture:

- ☐ If the urine is foul smelling or cloudy, without other urinary symptoms
- ☐ Routinely after urethral catheter change
- ☐ Routinely upon admission
- ☐ After treatment to "document care" or "test of cure"
- ☐ For mental status changes (without vital sign changes or urinary symptoms for noncatheterized residents)

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Asymptomatic Bacteriuria is Common!

Table 1.
Prevalence of Asymptomatic Bacteriuria Reported for Different Populations

Population	Prevalence, %	Reference
Persons with diabetes		
Women	10.8–16	[12]
Men	0.7–11	[12]
Elderly persons in the community (age ≥70 y)		
Women	10.8–16	[13]
Men	3.6–19	[13]
Elderly persons in a long-term care facility		
Women	25–50	[13]
Men	15–50	[13]

Table 1.
Prevalence of Asymptomatic Bacteriuria Reported for Different Populations

Population	Prevalence, %	Reference
Persons with spinal cord injury		
Intermittent catheter use	23–69	[14]
Sphincterotomy/condom catheter	57	[15]
Persons with indwelling catheter use		
Short-term	3%–5%/day catheter	[18]
Long-term	100	[19]

Nicolle et al., Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America, *Clinical Infectious Diseases*, Volume 68, Issue 10, 15 May 2019

Sample SBAR Tool for Suspected Urinary Tract Infection

SUMMIT ACRES

Mr. Walker MRN 74646327

S **Situation**

I am concerned about a suspected UTI for the above resident.

B **Background**

Indwelling catheter √Yes □No If yes, √ Urethral □ Suprapubic

Incontinence □Yes √No If yes, is this new or worsening □Yes □No

UTI in last 6 months √Yes □No If yes, Date: 3/13/25 Organism: Proteus mirabilis Treatment: cephalexin

Active diagnosis (especially bladder, kidney, genitourinary conditions; diabetes; receiving dialysis, anticoagulants):

Advance directives for limiting treatment (especially antibiotic use): No

Medication allergies:

A **Assessment**

Vital signs: BP 165 /85 HR 72 Resp. rate 18 Temp. 101.5 O_2 Sats. 98

Resident WITH indwelling catheter

The criteria are met to initiate antibiotics if one of the following are selected:

No Yes

- □ √ Fever of 100°F (38°C), or 2°F (1.1°C) above baseline, or repeated temperatures of 99°F (37°C)
- □ √ New back or flank pain
- □ √ Rigors / shaking / chills
- □ □ New onset delirium (new dramatic change in mental status)
- □ □ Hypotension (significant change in baseline BP or SBP <90)
- □ □ Acute suprapubic pain
- □ □ Acute pain, swelling or tenderness of the scrotal area

Resident WITHOUT indwelling catheter

Criteria are met to initiate antibiotics if one of the three situations are met:

No Yes

- □ □ Any one of the following two:
  - □ Acute dysuria alone (pain or burning while urinating)
  - □ Acute pain, swelling or tenderness of the scrotal area

OR

- □ □ Single temp of 100°F (38°C), or 2°F (1.1°C) above baseline, or repeated temperatures of 99°F (37°C) **and** at least one of the following new or worsening symptoms:
  - □ Urgency □ Suprapubic pain □ Frequency
  - □ Gross hematuria □ Back or flank pain □ Urinary incontinence

OR

- □ □ No fever, but two or more of the following new or worsening symptoms:
  - □ Urgency □ Suprapubic pain □ Frequency
  - □ Gross hematuria □ Urinary incontinence

Successful Implementation

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R	**Recommendation** √ **Protocol criteria met.** Resident may require UA and urine culture or an antibiotic. □ **Protocol criteria are NOT met.** Resident **DOES NOT** need immediate antibiotic but may need additional observation.
	Nurse's Signature: Nurse Debby Summit **Date/Time:** 5/30/25 □ **Notification of Family/POA Name:** **Date/Time:** □ **Faxed or** √ **Called to:** Dr. John Steward **By:** Nurse Summit **Date/Time:** 5/30/25

Physician Orders/Response (Please check all that apply)

√ I have reviewed the above **SBAR**.

√ Urine culture (if indicated)
√ Encourage 4oz of cranberry juice or another liquid (_____) for _____ times/day, until symptoms resolve
□ Record fluid intake & output until symptoms resolve (output can also be measured from urinal or by weighing diapers, etc.)
√ Assess vital signs, including temp; every 4 _____ hours for 24 _____ hours
□ Monitor and notify PCP if symptoms worsen or unresolved in _____ hours
√ Other: Exchange Foley catheter prior to urine culture
√ For antibiotic orders (if needed) please complete script below:

Drug: Ceftriaxone Dose:2g Route: IV Frequency: Daily Duration: 72 h Indication: CAUTI

Physician Signature: Dr. Steward	**Date/Time:** 5/30/25

Please Fax Back To: _____ or □ **Telephone Order**

File Under Physician Order/Progress Notes

Successful Implementation

https://asap.nebraskamed.com/facilities/long-term-care/tools-and-templates-for-long-term-care/

Clinical Scenario

After implementing your UTI SBAR based on Loeb's criteria, you educated staff for 2 months on this new tool and saw a 25% reduction in UTI antibiotic starts the following quarter. Leadership is pleased and has allocated stewardship FTE for further work with the consultant pharmacist.

Now, you review an SBAR for Ms. Barnes, a healthy 63-year-old woman with no catheter. She met Loeb's criteria with dysuria, urgency, and hematuria, and was started on nitrofurantoin for 7 days. You checked on her on day 3, and she still has symptoms, but her urine culture, which resulted on day 2, shows no growth. Her treatment plan has not changed.

What do you recommend?

a) Continue treatment. Antibiotics may take time to work
b) Implement a formal antibiotic time-out so plans can be adjusted
c) Ask the medical director to broaden coverage

CDC PHIL 23257. Robert Denty. Public Domain

SBAR Communication Tool Template for Antibiotic Time-Out

SUMMIT ACRES

Ms. Barnes MRN 5498131

S **Situation:** I am calling to follow-up on [resident's name: Ms. Barnes] who was started on antibiotic(s) recently.

B **Background:** This patient was started on:

Antibiotic #1: Nitrofurantoin 100mg BID Start date: 5/27/30

Antibiotic #2: _____ Start date: _____

For: ☒UTI ☐Pneumonia ☐Bronchitis ☐Skin infection ☐GI infection

☐Fever of unknown source ☐Other, specify: _____

Vitals at initial presentation were as follows: BP 136 /80 HR 100 Resp. rate 18 Temp. 97.5 O_2 Sats. 98

Symptoms and positive exam findings at that time were: Dysuria, urgency, Hematuria

The diagnosis fits: ☐McGeer criteria ☒Loeb criteria ☐Neither ☐Assessment tool not used

A **Assessment:**

Current vital signs: BP 140 /84 HR. 98 Resp. rate 18 Temp. 97 O_2 Sats. 99

Since starting antibiotic(s), the resident:

☐now has *no* signs or symptoms of infection ☒has remained the same

☐has improved but continues to have signs and symptoms of: _____

☐has *new or worsening* signs/symptoms of: _____

Microbiology culture result (fax microbiology report if available):

☐has not returned yet ☒has *no* growth ☐was not obtained

☐has positive Gram stain/growth of [specify Gram stain/microorganism: _____]

Is susceptible to the antibiotic(s) prescribed: ☐Yes ☐No ☐Don't know ☐Not tested by lab ☐Not yet performed by lab

Other antibiotics the organism is sensitive to: _____

https://asap.nebraskamed.com/wp-content/uploads/sites/3/2020/02/SBAR-communication-tool-template-for-antibiotic-time-out.docx

R	**Recommendation:** ☒ Patient **is not improving** and needs further evaluation. ☐ Patient **has improved** and needs final antibiotic therapy plan.
	Nurse's Signature: Nurse Debby Summit **Date/Time:** 5/30/25 ☐ **Faxed or** ☒ **Called to:** Dr. John Steward **By:** Nurse Summit **Date/Time:** 5/30/25

Physician Orders/Response (Please check all that apply)

☒ I have reviewed the above **SBAR**.

☐ Continue current antibiotic to complete a total antibiotic course of _____ days. Specify Antibiotic End date: _____

☐ Change antibiotic therapy to:

Drug: _____ Dose: _____ Route: _____ Frequency: _____ Duration: _____

☒ Stop antibiotic now

☒ Other (Please specify): Send to CT scan with clinical suspicion for kidney stones _____

Physician Signature: Dr. Steward	**Date/Time:** 5/30/25

Please Fax Back To: _____ or ☒ **Telephone Order**

Created by Phil Chung, PharmD, MS, BCPS and Salman Ashraf, MBBS

https://asap.nebraskamed.com/wp-content/uploads/sites/3/2020/02/SBAR-communication-tool-template-for-antibiotic-time-out.docx

Clinical Scenario

You are reviewing urine culture results to assess the prevalence of ESBL-producing organisms in your facility. During the review, you observe that over a quarter of urine cultures are polymicrobial, growing three or more organisms, an indicator that may suggest contamination.

Further investigation reveals that your facility lacks standardized policies and procedures for proper urine culture collection. In response, you decide to audit current collection practices to identify areas for improvement and reduce contamination rates.

CDC PHIL 28933. Allyson O'Connor. Public Domain

Mr. Watkins

Mr. Watkins is a 70-year-old man with prostate cancer and obstructive uropathy. He has an indwelling Foley catheter that is routinely changed every month; the last exchange was 3 weeks ago. He developed flank pain and a fever of 100.9°F. A urine culture was ordered. The chart notes that urology approved catheter changes to be done at the nursing home as needed.

The nurse performed the following steps:

- Foley catheter was exchanged using aseptic technique and proper hand hygiene.
- The new catheter was clamped for 15 minutes.
- Sterile gloves were donned.
- The catheter port was cleaned with an alcohol wipe.
- 5 mL of urine was aspirated with a 10 mL syringe and transferred to a sterile specimen container.
- The container was labeled with the patient's name, date, and time.
- The sample was left on the desk at the nursing station awaiting pickup by a regional lab in approx. 2 hours.

CDC PHIL 13498. Amanda Mills. Public Domain

Urine Collection for Patients with Chronic Indwelling Urinary Catheter

If possible, change the urinary catheter before collecting a sample. Especially for those in place for more than 2 weeks or for an unknown period

Hand hygiene and sterile gloves

If there is no urine in the tube, clamp the tube for 15-30 minutes prior to the procedure

Clean the collecting port with alcohol wipe prior to access

Insert a 10 cc syringe at an angle into the port. Draw back 3-5 ml

Insert specimen into sterile container

Date, label, time the specimen. Transfer to lab or refrigerator within 15 minutes

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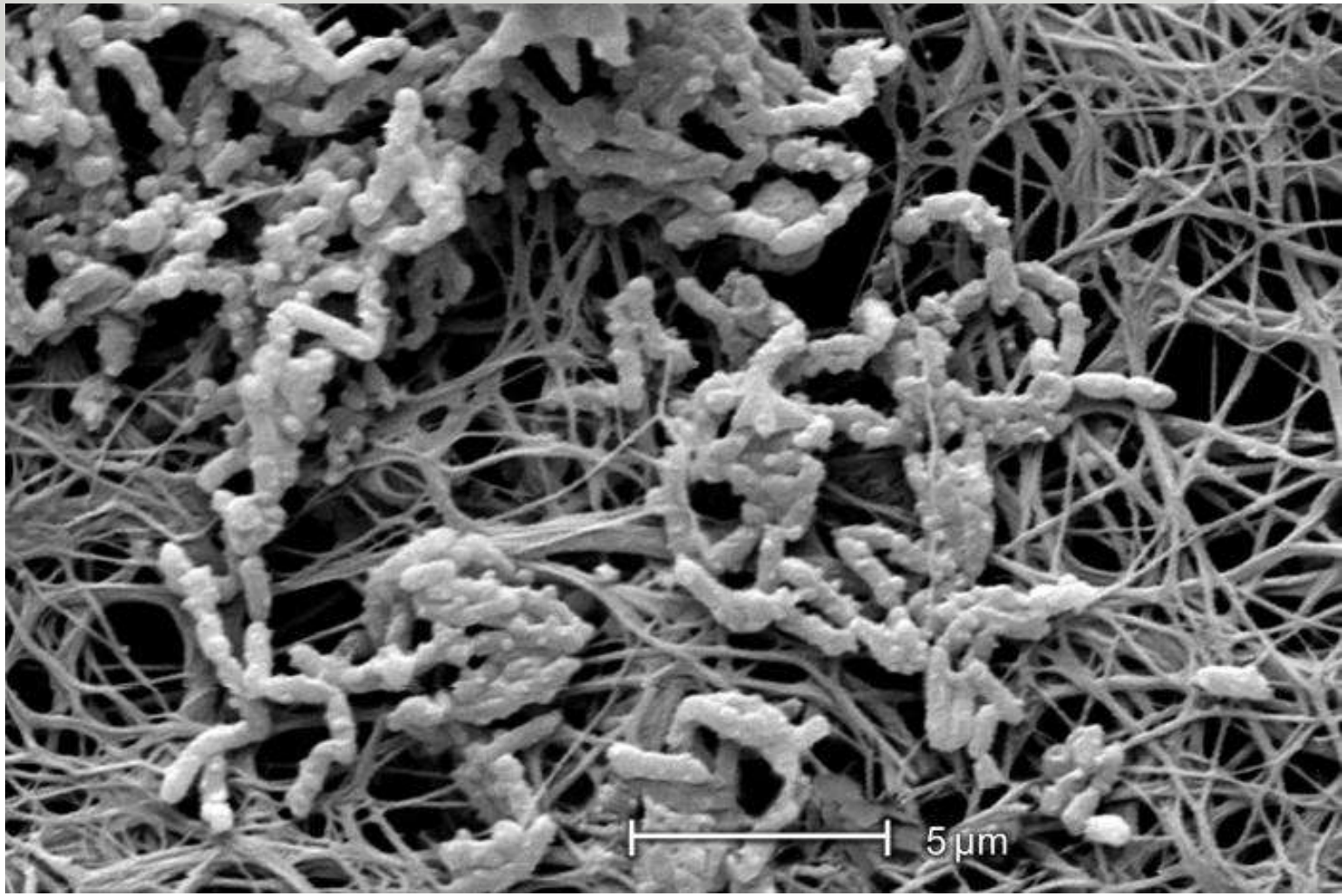
Biofilm

Within 1 to 3 days of a catheter placement, bacteria will colonize the catheter and coat the plastic with biofilm

You may obtain a false positive test from bacteria that came from the biofilm

In a real infection, placing a new catheter may hasten the resolution of symptoms



CDC PHIL 10548. Janice Haney Carr. Public Domain

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Ms. James

Ms. James is a 65-year-old woman who underwent L hip replacement after a fall and fracture of her femur. She can bear weight for a few seconds and can walk to the bathroom with assistance. She is complaining of burning with urination that began yesterday morning. She also reports frequency and some suprapubic tenderness. You want to get a urinalysis and urine culture. Which of the following is the best option:

a) Clean catch (midstream sample)
b) Provide her with a toilet hat and collect the sample from that device
c) Given her limited mobility, perform an in-and-out catheterization
d) Offer to catch the urine while she urinates in bed

CDC Phil. Public Domain

Urine Collection for Patients Without Catheters

Consider collecting urine after the resident has taken a bath, or use a sponge rinse with soap and water

Midstream clean-catch is the preferred method

In-and-out catheterization

Clean genital area as described above

Perform catheterization using sterile technique

Alternative to in-and-out catheterization for men: place and obtain a specimen from a new condom catheter. Check the collection bag every 30 minutes

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Clinical Scenario

While reviewing antibiotic use in your 50-bed long-term care facility, you notice that the average therapy duration is skewed by 8 residents (16%) on continuous antibiotics for recurrent UTI prophylaxis. Most (7 of 8) are women over age 55. Only one is on vaginal estrogen, one on methenamine (with a suprapubic catheter), and one on cranberry. Based on this data, the UTI prophylaxis rate appears higher than the national average (~18% of all antibiotics in LTC, which includes prophylaxis for other conditions).

What is your next step?

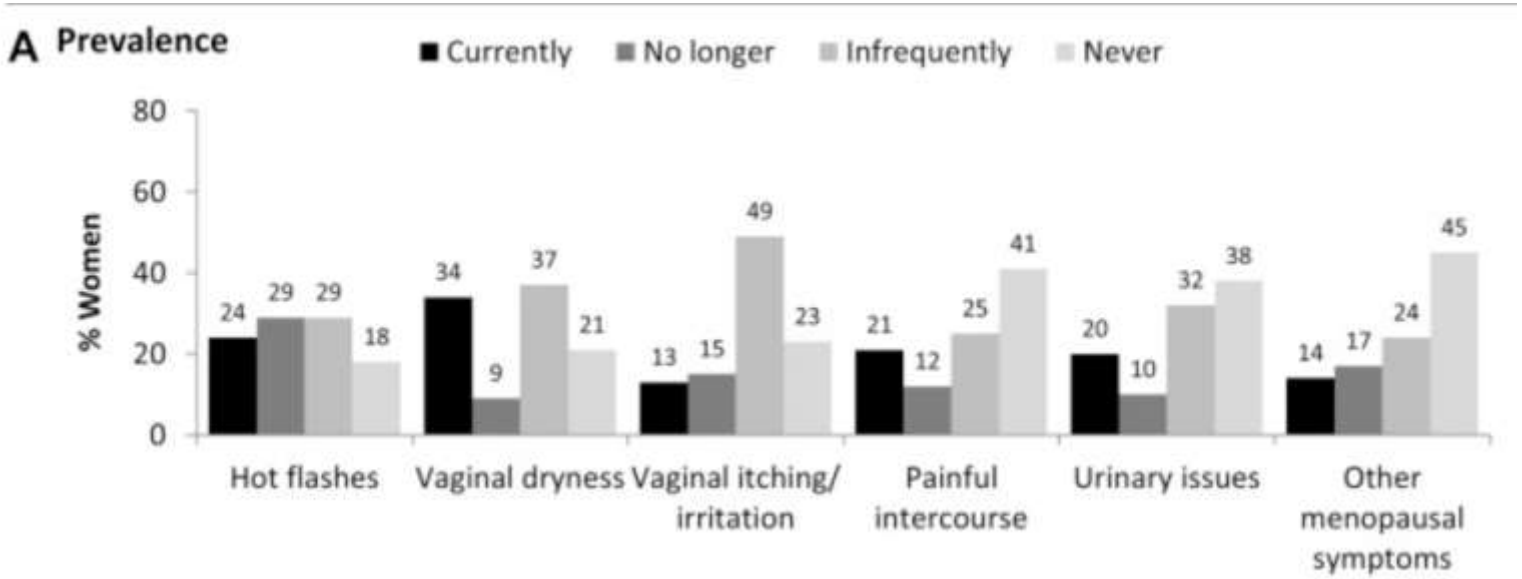
a) Continue current management, as UTIs are dangerous
b) Start cranberry for everyone
c) Leave vaginal estrogen decisions to primary providers
d) Work with your consultant pharmacist to create a prophylactic antibiotic audit

CDC PHIL 17327. Cindy Fowler. Public Domain

Vaginal Estrogen – Underused Tool

Empower Survey: 2,309 women >= 45 yo completed the survey

1,858 had at least one symptom of vulval and vaginal dryness



Kingsberg et al. The Women's EMPOWER Survey: Identifying Women's Perceptions on Vulvar and Vaginal Atrophy and Its Treatment. *J Sex Med*. 2017;14(3):413-424.

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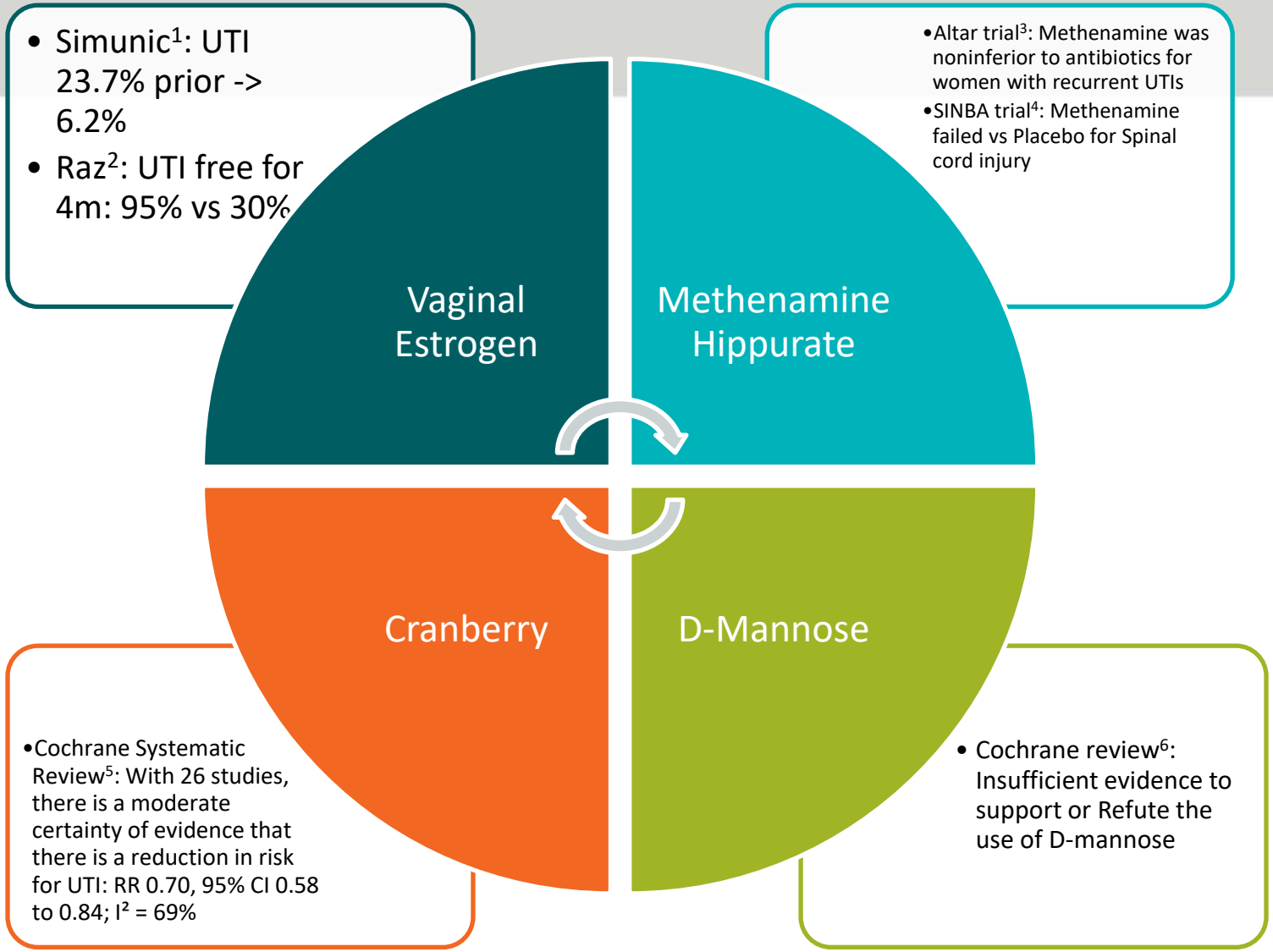
Vaginal Estrogen – Underused Tool

- 56% of women had never discussed their vaginal symptoms with HCPs
- 85% of women who spoke with their HCPs said they initiated the conversation
- For those who discussed treatment with a HCP, lubricants/moisturizer were discussed with 73% of women, hormone therapy with 46%, OTC options with 45%, and lifestyle changes with 15%
- HCPs also mentioned to 20% of women that VVA symptoms were part of aging and that they should learn to live with it

Kingsberg et al. The Women's EMPOWER Survey: Identifying Women's Perceptions on Vulvar and Vaginal Atrophy and Its Treatment. *J Sex Med*. 2017;14(3):413-424.

Antibiotics-sparring prophylaxis- Evidence



- Simunic[1]: UTI 23.7% prior -> 6.2%
- Raz[2]: UTI free for 4m: 95% vs 30%

- Altar trial[3]: Methenamine was noninferior to antibiotics for women with recurrent UTIs
- SINBA trial[4]: Methenamine failed vs Placebo for Spinal cord injury

- Cochrane Systematic Review[5]: With 26 studies, there is a moderate certainty of evidence that there is a reduction in risk for UTI: RR 0.70, 95% CI 0.58 to 0.84; $I^2 = 69\%$

- Cochrane review[6]: Insufficient evidence to support or Refute the use of D-mannose

1. *Int J Gynaecol Obstet*. 2003;82(2):187-197
2. *N Engl J Med*. 1993;329(11):753-756
3. *Health Technol Assess*. 2022;26(23):1-172
4. *Spinal Cord* 45, 542–550 (2007)
5. Cochrane Database of Systematic Reviews 2023, Issue 11. Art. No.: CD001321.
6. Cochrane Database of Systematic Reviews 2022, Issue 8. Art. No.: CD013608.

UTI Prophylaxis Tool

NEBRASKA ANTIMICROBIAL STEWARDSHIP ASSESSMENT AND PROMOTION PROGRAM — ASAP

Review of Antibiotic Prophylaxis in the Management of Recurrent Urinary Tract Infections (UTI) in Adults

Continuous antibiotic prophylaxis, while effective in the short-term, carries many risks including medication side effects in older patients[1], increased risk for multi-drug resistant organisms[2], and risk for *Clostridioides difficile* colitis[3].

Before considering antibiotic prophylaxis for recurrent UTIs, these non-antibiotic measures should be attempted first:

- Confirm the resident is experiencing true UTIs, not asymptomatic bacteriuria
- Maintain adequate hydration
- Encourage regular voiding. Holding in urine or not draining the bladder fully increases the risk of UTIs
- Ensure appropriate personal hygiene practices and proper care of urinary catheters
- Avoid sitting in wet or dirty undergarments for prolonged periods
- For post-menopausal women with risk factors such as atrophic vaginitis, prescribe topical vaginal estrogens
- Evaluate for underlying risk factors that may be the reason for recurrent UTIs and manage those accordingly
- Consider evaluation for kidney stones or a urology evaluation in functional patients

Non-Antibiotic Therapies & Supplements to Prevent UTIs

Pharmacist Monthly UTI Prophylactic Antibiotic Audit

Resident Name:					Sex:	Age:
Prophylactic Antibiotic Therapy	Antibiotic	Dose/Sig	Duration	Date Prescribed	Prescriber	
Is prophylaxis being cycled?	☐ Yes (List all cycled antibiotics above)				☐ No	
	If yes, how often?	☐ Monthly	☐ Every 2 months	☐ Every 3 months	☐ Other:	
Does the resident have a long-term urinary catheter?				☐ Yes	☐ No	
If yes, has the physician been notified to consider discontinuing antibiotics due to concern for resistance?						
☐ Yes, Date: _____		☐ No			☐ N/A	
Additional prescriptions for UTI while on prophylaxis?				☐ Yes	☐ No	
If yes, how many antibiotics in previous 12 months?						
If several antibiotics in previous 12 months, has the provider been notified to consider stopping prophylaxis due to failure of the strategy?		☐ Yes, Date: _____			☐ No	☐ N/A
Acute UTI Antibiotic Therapy (Previous 12 months)	Antibiotic	Dose/Sig	Duration	Date prescribed	Prescriber	
Any antibiotic prescribed for acute UTI same as prophylaxis?				☐ Yes	☐ No	
Any urine culture with resistance to prophylaxis?	☐ Yes			☐ No		
	If yes, has the prescriber been notified to consider discontinuing antibiotic prophylaxis?			☐ Yes, Date: _____		☐ No
Has the prescriber documented review of the prophylactic antibiotic in the last 6 months?				☐ Yes, Date: _____		☐ No
Documented plan for prophylaxis duration/stop date?						
Audit conducted by:				Date:		

https://asap.nebraskamed.com/wp-content/uploads/sites/3/2024/03/ASAP-Guidance-Review-of-Antibiotic-Prophylaxis-in-the-Management-of-Recurrent-Urinary-Tract-Infections.pdf

ICAP

For Treatment, Shorter is Better

Nebraska Medicine

SERIOUS MEDICINE. EXTRAORDINARY CARE.

Urinary Tract Infection and Asymptomatic Bacteriuria Guidance

Urinary tract infection (UTI) is the most common indication for antimicrobial use in hospitals, and a significant proportion of this use is inappropriate or unnecessary.[1] The Antimicrobial Stewardship Program at the Nebraska Medical Center has developed guidelines to facilitate the evaluation and treatment of UTIs.

Treatment of Complicated UTI at Nebraska Medicine

Table 4: Outpatient Management

Complicated Cystitis

1. Trimethoprim-sulfamethoxazole 160/800 mg (one DS tablet) BID **x 7 days** OR
2. Levofloxacin 500 mg PO daily or ciprofloxacin 500 mg PO BID x **5-7 days**

Alternatives with less data or less activity:

1. Nitrofurantoin 100 mg PO BID **x 7-10 days**
   a. Not recommended in patients with concern for pyelonephritis or CrCl <30 mL/min
2. Oral beta-lactams **x 7 days**
   a. Cephalexin 500 mg BID
   b. Cefdinir 300 mg BID
   c. Amoxicillin-clavulanate 500 mg BID

https://www.unmc.edu/intmed/divisions/id/asp/clinicalpath.html

Shorter Is Better

Diagnosis	Short (d)	Long (d)	Result	#RCT
CAP	3-5	5-14	Equal	14
Atypical CAP	1	3	Equal	1
Possible PNA in ICU	3	14-21	Equal	1*
VAP	5-8	10-15	Equal	3
Empyema	14-21	21-42	Equal	2
Cystic Fibrosis Exacerbation	10-14	14-21	Equal	1
Bronchiectasis Exacerbation	8	14	Equal	1
cUTI/Pyelonephritis	5 or 7	10 or 14	Equal	13**
Intra-abd Infection	4	8-10	Equal	3
Complex Appendicitis	1-2	5-6	Equal	2
Bacteremia (non *S. aureus*)	7	14	Equal	4'
Cellulitis/Wound/Abscess	5-6	10	Equal	4‡
Osteomyelitis	42	84	Equal	2
Osteo Removed Implant	28	42	Equal	1
Debrided Diabetic Osteo	10-21	42-90	Equal	2Φ
Septic Arthritis	14	28	Equal	1
Bacterial Meningitis (peds)	4-7	7-14	Equal	6
AECB & Sinusitis	≤5	≥7	Equal	>25
Variceal Bleeding	2-3	5-7	Equal	2
Neutropenic Fever	AFx72h/3 d	+ANC>500/9 d	Equal	2
Post Op Prophylaxis	0-1	1-5	Equal	57Ψ
Erythema Migrans (Lyme)	7-10	14-20	Equal	3
P. vivax Malaria	7	14	Equal	1
Early Syphilis	1 IM	3 IM in 3 wks	Equal	2
Total: 24 Conditions				>150 RCTs

https://www.bradspellberg.com/shorter-is-better

Respiratory Tract Infection

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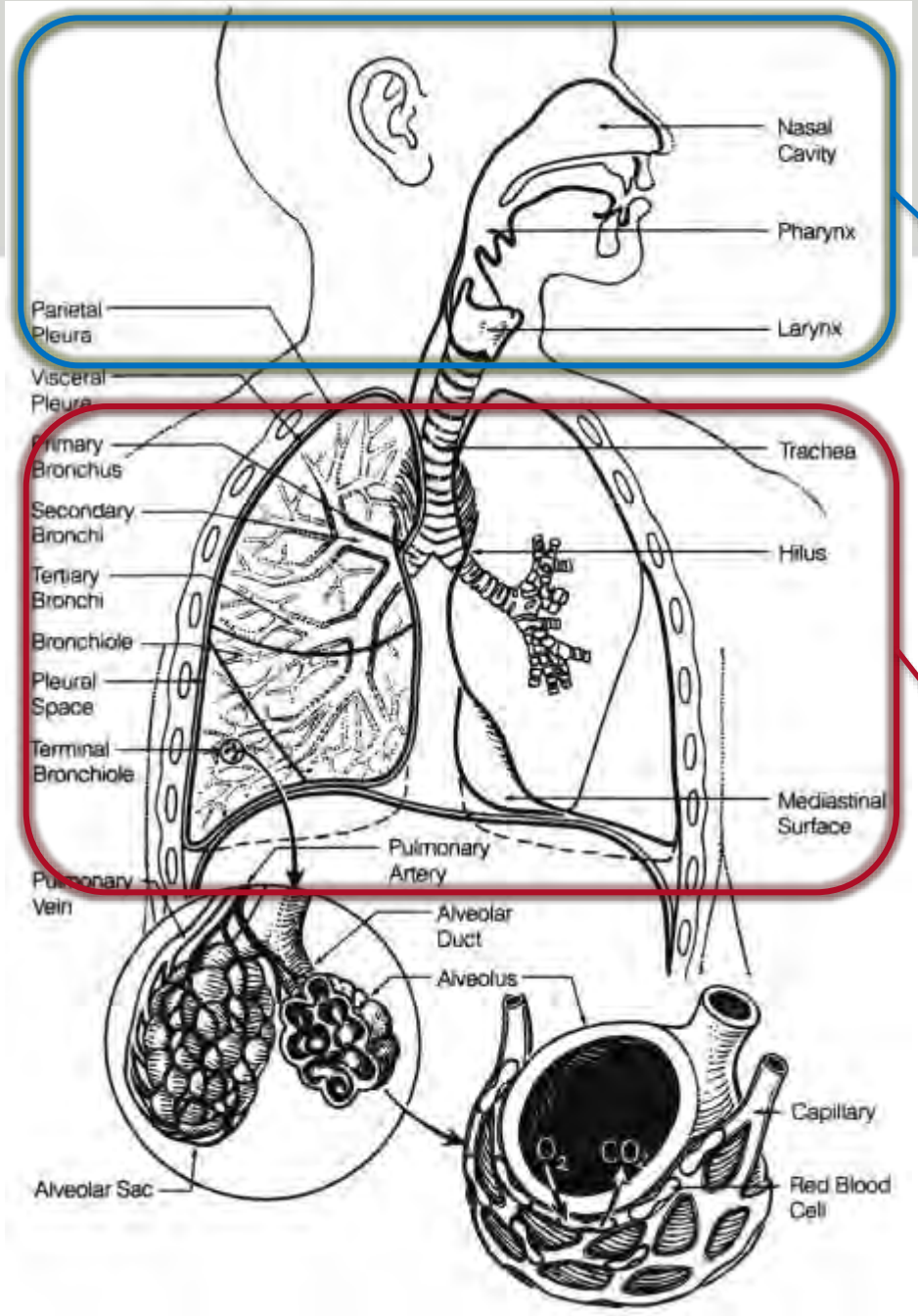
Symptoms of Infection

Runny Nose (Rhinorrhea/Coryza)
Sneezing
Sore throat
Cough
Swollen Lymph nodes
Myalgias
Fever

Cough
Shortness of breath
Sputum
Myalgias
Fever
Hypoxia



Level of infection

Upper Respiratory Infection

Lower Respiratory Infection

National Cancer Institute. Unknown Illustrator. Public Domain

Upper or Lower Respiratory Tract Infection Descriptions

Sinusitis

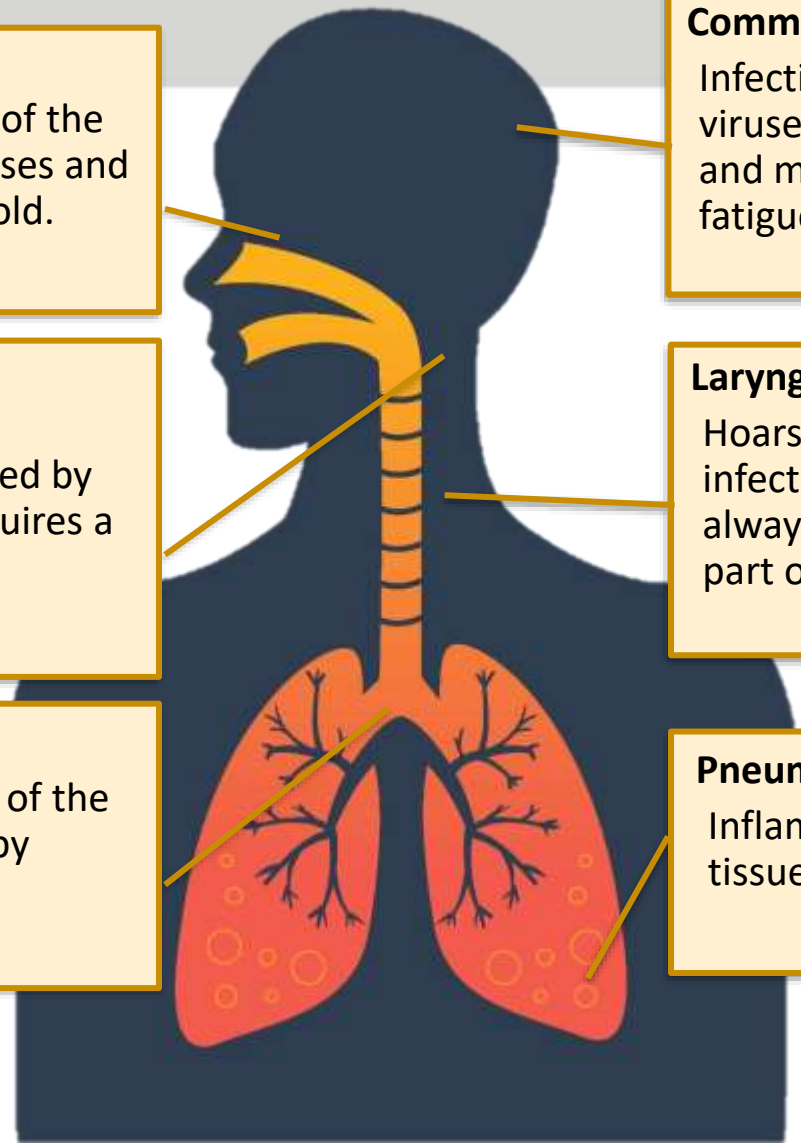
Inflammation and infection of the sinuses; 98% caused by viruses and usually part of a common cold.

Strep Throat

Infection of the tonsils and posterior oropharynx. Caused by group A *Streptococcus*. Requires a diagnostic test.

Bronchitis

Inflammation and infection of the large airways; 90% caused by viruses.



Common Cold

Infection caused by many different viruses. Affects sinuses and throat and may also cause headache, fatigue, low-grade fever.

Laryngitis

Hoarse voice; inflammation and infection of the vocal cords; nearly always a viral infection and usually part of a common cold.

Pneumonia

Inflammation and infection of lung tissue; ~75% caused by bacteria.

Assessment and Management of the Resident With a Suspected Respiratory Tract Infection. Content last reviewed June 2021. Agency for Healthcare Research and Quality, Rockville, MD.

Clinical Scenario

It's mid-December. After your success improving UTI antibiotic use, you're turning your attention to stewardship for respiratory infections. Nurse Summit mentions Mr. Benington, a 72-year-old man with early Alzheimer's disease who has developed fever (101°F), body aches, chills, runny nose, dry cough, and sinus pressure. His oxygen saturation is normal, and Dr. Steward noted his lungs are clear on exam. Based on the clinical picture, you suspect a viral upper respiratory infection.

What is your next step?

a) Avoid antibiotics and provide supportive care. He'll likely improve on his own
b) Look for Loeb's minimum criteria for upper respiratory infections. I'm sure it exists, right?
c) Order a chest X-ray to rule out pneumonia
d) Use a surveillance definition to guide your next step

CDC PHIL 9422. James Gathany. Public Domain

McGeer Criteria

Table 3. Respiratory Tract Infection (RTI) Surveillance Definitions		
Syndrome	**Criteria**	**Selected Comments***
Common cold syndrome or pharyngitis	***Must fulfill at least 2 criteria.*** ☐ Runny nose or sneezing ☐ Stuffy nose or nasal congestion ☐ Sore throat, hoarseness, or difficulty in swallowing ☐ Dry cough ☐ Swollen or tender glands in the neck (cervical lymphadenopathy)	• Fever may or may not be present • Symptoms must be new and not attributable to allergies
Influenza-like illness	***Must fulfill both 1 AND 2.*** ☑ 1. Fever ☑ 2. At least three of the following criteria ☑ Chills ☐ New headache or eye pain ☑ Myalgias or body aches ☑ Malaise or loss of appetite ☐ Sore throat ☑ New or increased dry cough	• If both criteria for influenza-like illness and another upper or lower RTI are met, only record diagnosis of influenza-like illness

https://asap.nebraskamed.com/wp-content/uploads/sites/3/2018/04/Revised-McGeer-criteria-for-infection-surveillance-checklist.pdf

Clinical Scenario

Mr. Benington meets the criteria for influenza-like illness (ILI), and you send a test, which comes back positive. This triggers the following actions:

1. Mr. Benington was started promptly on oseltamivir
2. You place him on standard and droplet precautions
3. You test those exposed and those with symptoms

Two days later, his roommate develops symptoms.

You have two cases within 72 hours, one of them with laboratory-confirmed influenza

1. You define this as an outbreak and begin treatment promptly for those with symptoms
2. You start chemoprophylaxis for those non-ill on the same unit, and you continue that until 7 days after the most recent identified case
3. You limit large group activities

https://www.cdc.gov/flu/hcp/infection-control/ltc-facility-guidance.html

Clinical Scenario

After managing your last influenza outbreak, you've partnered with the consulting pharmacist to prepare a line list with residents' weights and renal function in case antiviral treatment or prophylaxis is needed. You've also implemented a strong flu vaccination program, including for Ms. Patrick, a pleasant 66-year-old woman with diabetes, hypertension, heart failure, and rheumatoid arthritis, who received her flu shot two weeks ago.

Over the past week, Ms. Patrick has developed a worsening productive cough (frothy, clear sputum), shortness of breath, and oxygen saturation of 89% on room air. She is now sleeping propped up on multiple pillows. She has no fever. She's been going out daily with her family, who are visiting town and enjoying the local food scene. Due to a lack of improvement, Dr. Steward started her on a 14-day course of moxifloxacin.

Question:
What issues or concerns do you identify with her current management?

CDC PHIL 9411. Judy Schmidt. Public Domain

SBAR Communication Tool Template for Suspected Lower Respiratory Tract Infection

SUMMIT ACRES

Ms. Patrick MRN 1515315

S — Situation

I am concerned about a suspected lower respiratory tract infection (pneumonia/bronchitis) for the above patient.

B — Background

History of COPD ☐ Yes ☒ No

History of heart failure ☒ Yes ☐ No

History of LRTI in last 6 months ☐ Yes ☒ No

Use of supplemental O_2 ☐ Yes ☒ No

O_2 requirement has increased ☐ Yes ☐ No

If yes, Date: _____ Treatment: _____

Active chronic diagnosis (especially chronic lung, heart, or renal diseases, malignancies, asplenia, immunosuppression, diabetes): ____

Advance directives for limiting treatment (especially antibiotic use): No

Medication allergies: Penicillin allergy (headache)

A — Assessment

Vital signs: BP 190 / 100 HR 110 Resp. rate 26 Temp. 97.2 O_2 Sats. 89

Residents with fever ≥102°F (38.9°C)

Criteria are met to initiate antibiotics if ONE of the following are selected:

No	Yes	
☐	☐	New or increased cough
☐	☐	New or increased sputum production
☐	☐	Respiratory rate ≥25 breaths/minute
☐	☐	O_2 sat <94% on room air or >3% decrease from baseline O_2 sat
☐	☐	New or changed lung exam abnormalities
☐	☐	Pleuritic chest pain

Residents with fever ≥100°F (37.9°C) but <102°F (38.9°C) or ≥2.4°F (1.5°C) above baseline temperature

Criteria are met to start antibiotics if BOTH of the following are selected:

No	Yes	
☐	☐	New or increased cough, AND
☐	☐	At least one of the following:
	☐	Pulse >100 beats / minute
	☐	New or worsened delirium
	☐	Rigors
	☐	Respiratory rate ≥25 breaths/minute

Afebrile resident with COPD and age >65 years old

Criteria are met to initiate antibiotic if BOTH of the following are selected:

No	Yes	
☐	☐	New or increased cough, AND
☐	☐	Purulent sputum production

Afebrile resident without COPD and age >65 years old

Criteria are met to initiate antibiotic if ALL of the following are selected:

No	Yes	
☐	☒	New or increased cough, AND
☒	☐	Purulent sputum production, AND
☐	☒	At least one of the following:
	☐	New or worsened delirium
	☒	Respiratory rate ≥25 breaths/minute

https://asap.nebraskamed.com/wp-content/uploads/sites/3/2018/04/SBAR-communication-tool-template-for-suspected-lower-respiratory-tract-infection.docx

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R	**Recommendations** ☐ **Protocol criteria met.** Resident may require a chest X-ray, CBC with differential, and/or antibiotics. ☒ **Protocol criteria NOT met.** Resident **does not** need immediate antibiotic order but may need additional observation.
	Nurse's Signature: Nurse Summit **Date:** 12/20/2024 ☐ **Notification of Family/POA Name:** **Date/Time:** ☐ **Faxed or** ☒ **Called to:** Dr. Steward **By:** Nurse Summit **Time:** 12/20/2024

Physician Orders/Response (Please check all that apply)

☒ I have reviewed the above **SBAR**.

☒ Chest X-Ray

☐ For cough, use cough suppressant: _____ Dose: _____ Route: _____ Frequency: _____ Duration: _____

☐ For fever, use acetaminophen. Dose: _____ Route: _____ Frequency: _____ Duration: _____

☐ For shortness of breath, inhale/nebulize: _____ Dose: _____ Route: _____ Frequency: _____ Duration: _____

☐ Encourage 4 oz. of fluid (_____) TID, until symptoms resolve.

☒ Record fluid intake & output until symptoms resolve (output can also be measured from urinal or by weighing briefs, etc.).

☐ Assess vital signs, including temp, every _____ hours for _____ hours; notify PCP if symptoms worsened or unresolved in _____ hours.

☒ Other orders: Daily weight, BNP, and start Lasix _____

☐ For antibiotic orders (if needed) please complete script

Drug: _____ Dose: _____ Route: _____ Frequency: _____ Duration: _____ Indication: _____

Physician Signature Dr. Steward	Date 12/20/24

https://asap.nebraskamed.com/wp-content/uploads/sites/3/2018/04/SBAR-communication-tool-template-for-suspected-lower-respiratory-tract-infection.docx

Recommended Workup for LRTI

- CBC with Differential
- Influenza during the appropriate season
- Sars-CoV-2
- Legionella and Streptococcus Pneumoniae (Strep pneumo) urine antigen
- Chest X-ray
- Sputum Culture

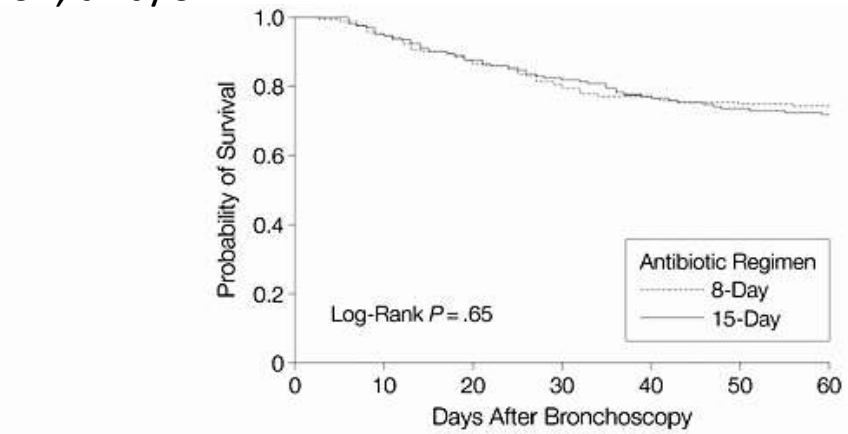
Duration of therapy

51 French ICUs

At least 48h Intubated.
New infiltrate AND
Tracheal purulent secretion,
fever 38.3C, WBC > 10k, and/or
Positive culture

401 patients

Non-inferiority, randomized trial comparing 8 vs 15 days of antibiotic therapy

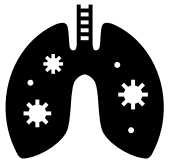


No. at Risk							
8-Day Antibiotic Regimen	197	187	172	158	151	148	147
15-Day Antibiotic Regimen	204	194	179	167	157	151	147

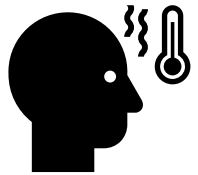
Chastre et al. Comparison of 8 vs 15 Days of Antibiotic Therapy for Ventilator-Associated Pneumonia in Adults: A Randomized Trial. *JAMA.* 2003;290(19):2588–2598

Duration of therapy

70 US Centers



New infiltrate AND
Fever, hypothermia, leukocytosis, and/OR > 10% bands



177 older adults

Randomized, double blind study of Levofloxacin 750mg for 5 days vs 500mg for 10 days

Table III. Clinical success rates at the posttherapy evaluation in the intent-to-treat population, by Pneumonia Severity Index (PSI) classification.

Class	Levofloxacin 750 mg/d for 5 Days, n/N (%)	Levofloxacin 500 mg/d for 10 Days, n/N (%)	95% CI*
All patients†	65/73 (89.0)	79/86 (91.9)	-7.1 to 12.7
PSI class			
I/II	16/17 (94.1)	14/14 (100)	-8.9 to 20.6
III/IV/V	49/56 (87.5)	65/72 (90.3)	-9.2 to 14.7
III	31/35 (88.6)	35/37 (94.6)	-8.2 to 20.3
IV	18/21 (85.7)	28/32 (87.5)	-19.4 to 23.0
V	-	2/3 (66.7)	NA

NA = not applicable.
*Two-sided 95% CI around the difference between standard therapy and levofloxacin 750 mg/d for 5 days.
†Seven patients receiving levofloxacin 750 mg/d for 5 days and 11 patients receiving standard therapy were excluded from the intent-to-treat population because they did not complete a posttherapy clinical evaluation.

Shorr et al. A multicenter, randomized, double-blind, retrospective comparison of 5- and 10-day regimens of levofloxacin in a subgroup of patients aged > or =65 years with community-acquired pneumonia. *Clin Ther*. 2005;27(8):1251-1259

Treatment and Duration

Assess for risk factors for infection with a multidrug-resistant organism. E.g., Recent exposure to antibiotics, recent admission to the hospital, known colonization

Duration

5 to 7 days of therapy

Beta-lactam therapy (amoxicillin-clavulanate, oral second or third-generation cephalosporins, ampicillin-sulbactam, or ceftriaxone)[3]

PLUS

azithromycin or doxycycline

Penicillin allergic:

moxifloxacin or levofloxacin

AHRQ Safety Program for Improving Antibiotic Use – Long-Term Care

Assessment and Management of the Resident With a Suspected Respiratory Tract Infection. Content last reviewed June 2021. Agency for Healthcare Research and Quality, Rockville, MD.

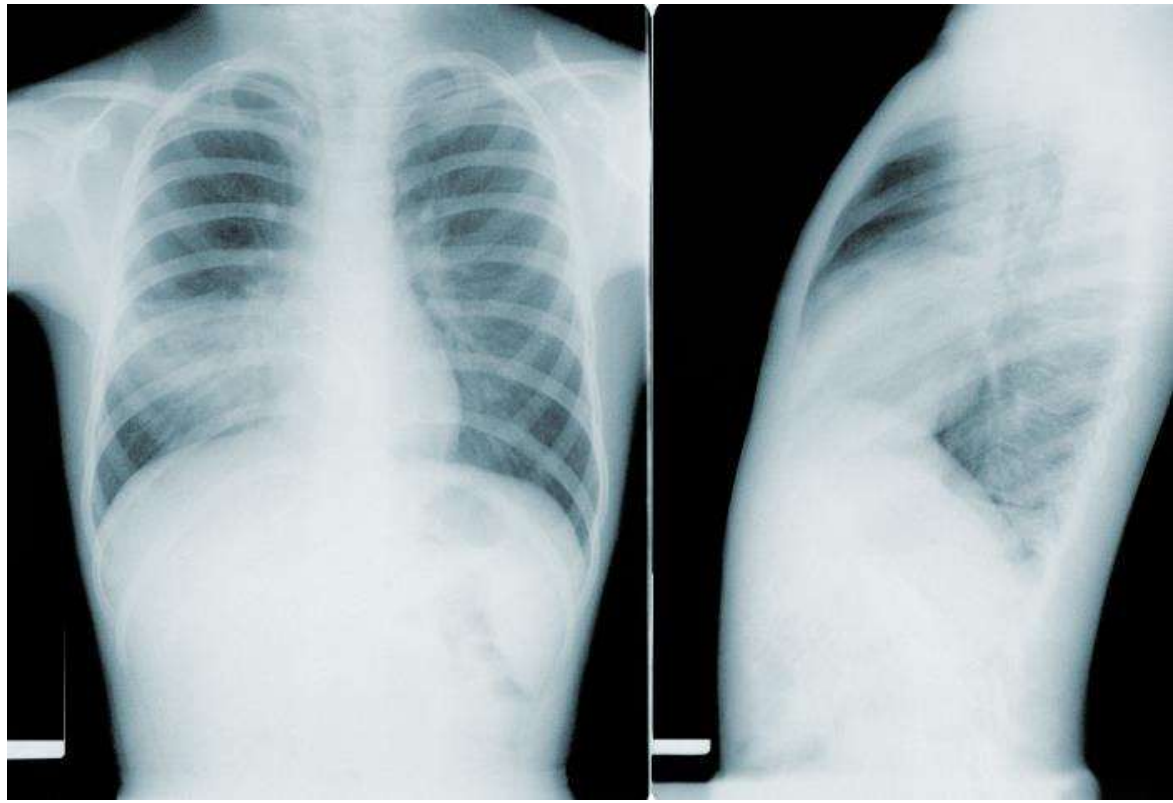
Clinical Scenario

One of your residents was diagnosed with a lower respiratory tract infection caused by *Mycoplasma pneumoniae*. He was treated with a 5-day course of antibiotics. Since completing treatment, he no longer has a fever, his oxygen levels are normal, his white blood cell count has returned to baseline, and he reports feeling generally better. However, he has continued to experience a dry cough for the past two weeks.

His family is concerned and upset that the cough has not fully resolved.

How would you manage this situation?

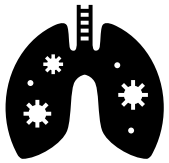
a) Repeat an antibiotic course. 5 days was too short
b) Repeat a chest X-ray to assess for persistent pneumonia
c) Send him to urgent care, as he is not improving
d) Reassure the patient and his family



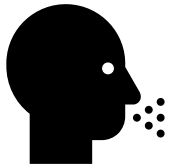
CDC PHIL 21525. Bruce Dull. Public Domain

Duration of cough

Primary and Urgent Care



Cough + SOB, sputum, body aches, chest discomfort, congestion, fever, chills, and/or sweats.



718 Adults

Table 4
Duration and severity of cough by type of infection and pathogen

	Bronchitis severity score at baseline (range 0–15)		Total duration of cough (d)			Overall cough severity (range 1–112)	
Type of infection	Score (95% CI)	Number	Mean (95% CI)	90th %[d]	Number	Severity (95% CI)	Number
Type of Infection							
1+ viruses and no bacteria detected	7.0 (6.6–7.4)[b]	100	14.7 (13.4–16.1)[a]	30	141	20.9 (18.6–23.3)[c]	151
1+ bacteria and no viruses detected	7.0 (6.5–7.4)	211	17.3 (15.9–18.6)	29	116	25.2 (22.7–27.7)	130
Mixed viral and bacterial growth	7.7 (7.2–8.2)	168	16.9 (15.2–18.6)	30	84	24.2 (22.4–25.1)	92
No detection of virus or bacteria	6.8 (6.2–7.4)	139	18.4 (16.2–20.6)	30	60	26.3 (22.5–30.1)	70
Total:	7.1 (6.9–7.3)	618	16.5 (15.7–17.3)	30	401	23.7 (22.4–25.1)	443

Ebell et al. Acute cough in outpatients: what causes it, how long does it last, and how severe is it for different viruses and bacteria? Clin Microbiol Infect. 2025 Jan;31(1):142.

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Skin and Soft Tissue Infection

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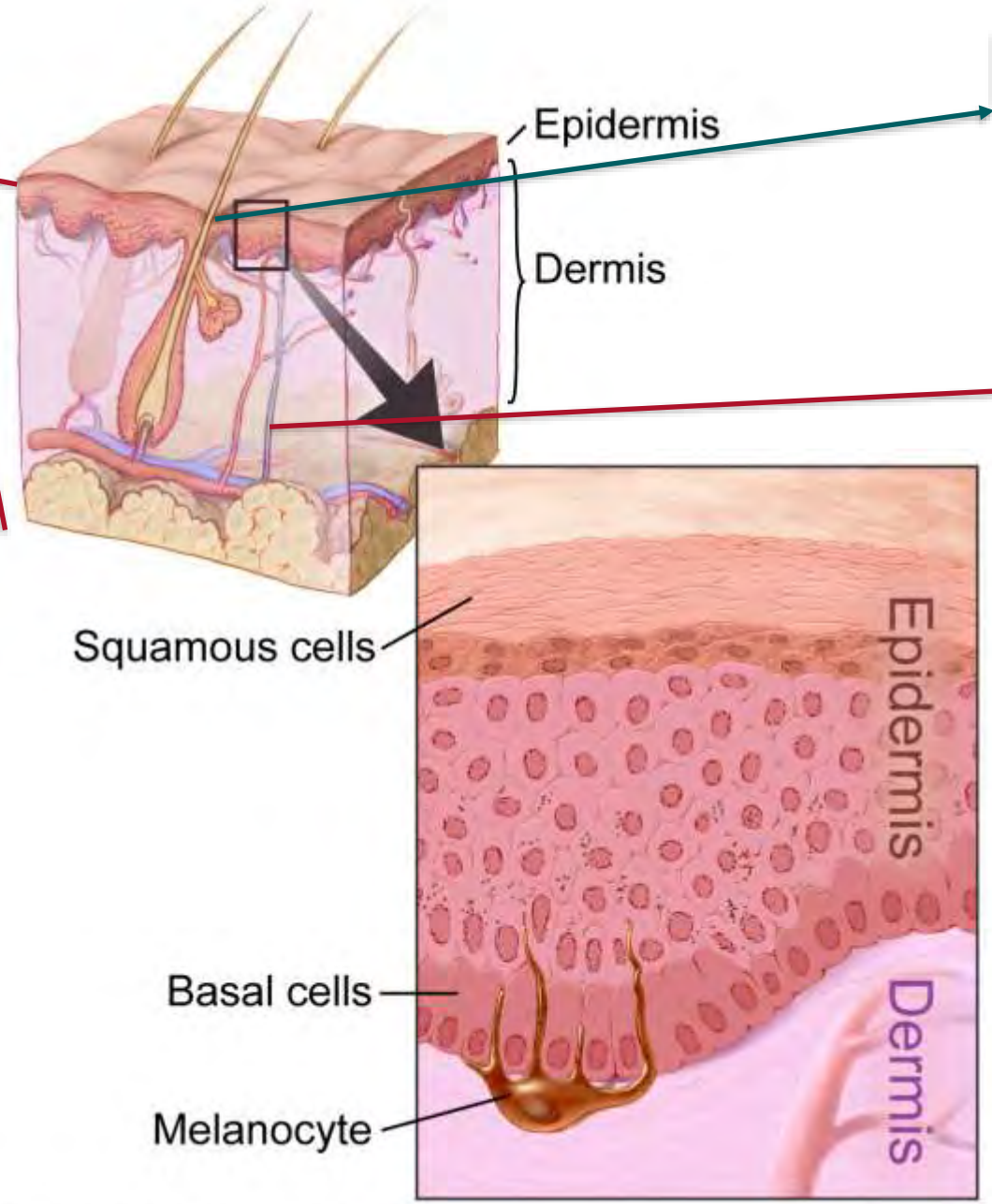
Impetigo

Folliculitis

Furuncle and Carbuncles

Cellulitis



National Cancer Institute. Don Bliss. Public Domain

Cellulitis

Organisms:
Staphylococcus aureus
Group A Streptococcus
Other Streptococcus spp.

Risk Factors:
Obesity
Venous Insufficiency
Lymphedema
Tinea Pedis
Skin Trauma

Cultures:
Blood cultures rarely positive
Skin cultures with frequent contaminants

Habif TP. Clinical Dermatology. 6th ed. Elsevier; 2016

Red

Hot

Elevating the Leg: Redness persists

Border: Irregular

Habif TP. Clinical Dermatology. 6th ed. Elsevier; 2016

Single side

Dimpled

Bullae

Cutaneous hemorrhage

Pruritus is rare

S — Situation

I am concerned about a suspected cellulitis / soft-tissue infection / wound infection for the above patient.

B — Background

History of recurrent skin infections ☐ Yes ☐ No
History of diabetes ☐ Yes ☐ No
History of peripheral vascular disease ☐ Yes ☐ No
History of chronic ulcer ☐ Yes ☐ No
Active chronic diagnosis (especially chronic lung, heart, or renal diseases, malignancies, asplenia, immunosuppression, diabetes):

_____

Is the resident on warfarin (Coumadin®) ☐ Yes ☐ No
Advance directives for limiting treatment (especially antibiotic use): _____
Medication allergies: _____

A — Assessment

Vital signs: BP _____/_____ HR _____ Resp. rate _____ Temp. _____ O_2 Sats.. _____

Minimum criteria to initiate antibiotics are met if ONE of the following 2 scenarios are selected:

No Yes

- ☐ ☐ New or increasing purulent drainage at a wound, skin, or soft-tissue site
- ☐ ☐ At least 2 of the following new or worsening signs or symptoms:
  - ☐ More heat (warmth) at affected site relative to other areas of the body
  - ☐ Redness (erythema) at affected site
  - ☐ Swelling at affected site
  - ☐ Increased tenderness or pain at affected site
  - ☐ Fever of 100°F (38°C), repeated temp of 99°F (37°C), or temp of 2°F (1°C) above baseline

Additional description of affected site:

Location
☐ Left side ☐ Right side ☐ Multiple sites

Body site
☐ Face/head/neck ☐ Upper extremities ☐ Chest/abdomen
☐ Groin ☐ Back ☐ Buttock
☐ Lower extremities ☐ Others: _____

Depth
☐ Intact skin ☐ Superficial wound ☐ Deep wound

Drainage
☐ None ☐ Serous ☐ Serosanguinous
☐ Purulent

Other significant findings: _____

_____

R — Recommendations

☐ **Protocol criteria met.** Resident may require antibiotics with or without wound care.

☐ **Protocol criteria NOT met.** Resident **does not** need immediate antibiotic order but may need additional observation.

Nurse's Signature: _____ **Date:** _____

☐ **Notification of Family/POA Name:** _____ **Date/Time:** _____

☐ **Faxed or** ☐ **Called to:** _____ **By:** _____ **Time:** _____

https://asap.nebraskamed.com/wp-content/uploads/sites/3/2019/01/SBAR-communication-tool-template-for-suspected-skin-soft-tissue-infection.docx

Non-Purulent Cellulitis

Recommended Treatment

For all patients: leg elevation

Mild (and oral transition for moderate-severe infections)

- **Preferred:** Cephalexin 1000mg PO q8h (alternative: 500mg PO q6h) **OR** Cefadroxil 1000mg q12h

Severe Penicillin Allergy†: Linezolid 600mg PO q12h **OR** TMP/SMX DS 1 tab PO q12h

Duration: 5-7 days

Moderate-severe

- **Preferred:** Cefazolin 2g IV q8h
- Alternatives: Linezolid 600mg PO q12h **OR** IV Ceftriaxone 2g daily

Penicillin Allergy†: Cefazolin 2g IV q8h

Duration: 5-7 days

Severe systemic illness (e.g., septic shock)

- Consider Linezolid 600 mg PO/IV q12h **OR** Daptomycin 4 mg/kg IV q24h **OR** Vancomycin IV [*Consult pharmacy for patient-specific dose*]

https://www.unmc.edu/intmed/_documents/id/asp/clinicpath-ssti.pdf

Purulent Cellulitis

Recommended Treatment

- **Incision/Drainage is essential for clinical cure**
- **Adjunctive antibiotics are recommended for all abscess >2cm[1,2] or in the following clinical situations:**
  - Severe or extensive disease (multiple sites)
  - Rapid progression of soft tissue infection
  - Signs/symptoms of systemic illness
  - Immunosuppression or comorbidities (diabetes, HIV, active neoplasm)
  - Extremes of age
  - Associated septic phlebitis
  - Sensitive area (face, hand, genitals)
  - Lack of response to incision/drainage

Mild

- TMP/SMX DS 1 tab PO q12h* **OR**
- Doxycycline/Minocycline¶ 100 mg PO q12h

Duration: 5 days

Moderate-severe

- Linezolid 600mg PO/IV q12h **OR** Daptomycin 4mg/kg IV q24h **OR** Vancomycin IV [*Consult pharmacy for patient-specific dose*]

Duration: 5-7 days

If gangrene, immunocompromised, and/or severe systemic symptoms, treat as per necrotizing SSTI guidance below

https://www.unmc.edu/intmed/_documents/id/asp/clinicpath-ssti.pdf

Prevention of Cellulitis Using Compression Stockings

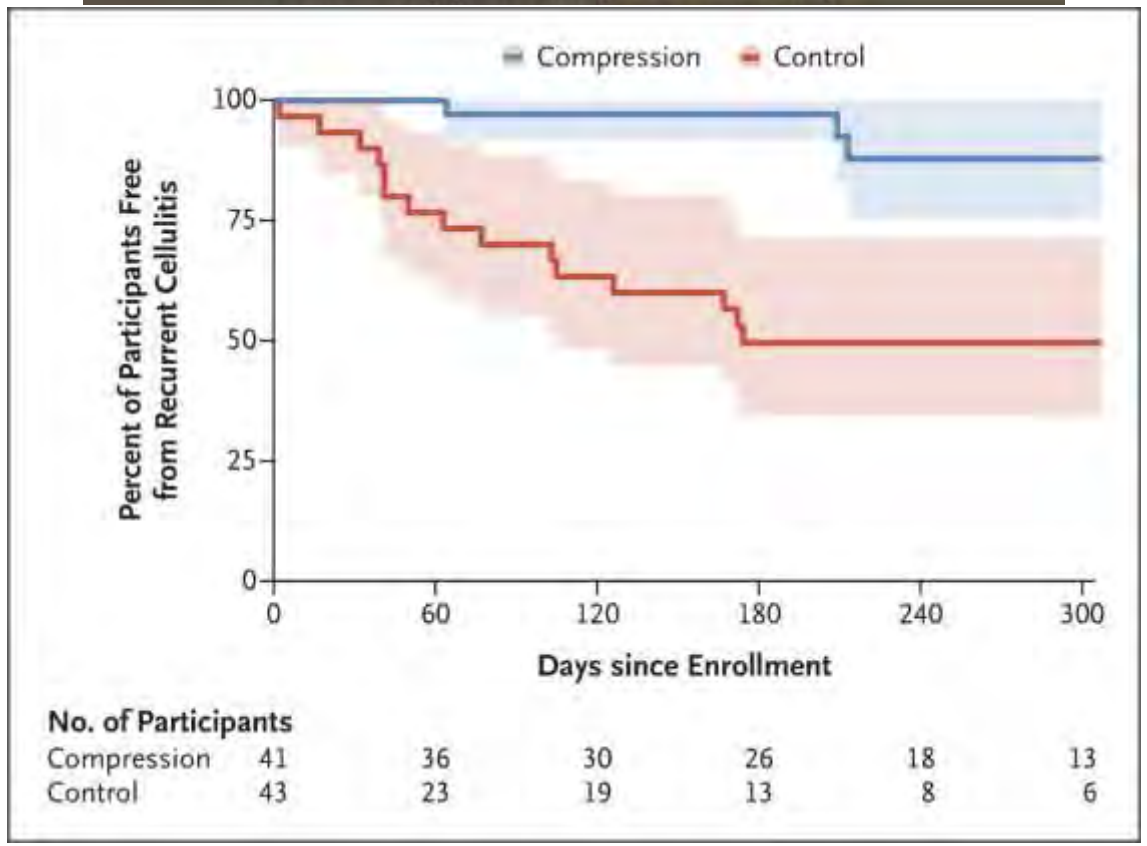
15% (6 episodes) **40%** (17 episodes)

Relative risk, 0.37; 95% CI , 0.16 to 0.84; P=0.02

Trial stopped early for efficacy

Single Center, Randomized, Nonblinded

2 or more cellulitis in the same leg in the two years before the trial



84 Patients

Compression stockings vs Education alone

Webb et al. Compression Therapy to Prevent Recurrent Cellulitis of the Leg. *N Engl J Med*. 2020;383(7):630-639.

Think about the mimics

- Stasis dermatitis
- Venous thrombosis
- Lymphedema
- Contact Dermatitis
- Eczema

Workbook Cases

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URINARY TRACT INFECTIONS PATIENT CASE

Mrs. Smith woke up a few days ago slightly more confused than normal. Since she has had recurrent UTIs, a urine culture was ordered by her provider when the nursing home called to inform the provider. The urine culture grows multiple organisms (including Gram-positive and Gram-negative bacteria).

What steps should the infection preventionist take to determine if this is a new infection or a case of colonization or asymptomatic bacteriuria?

Consider: clinical criteria, symptom documentation, and communication with nursing staff.

Loeb's Minimum Criteria

For Residents Without a Urinary Catheter

- ☐ Dysuria

OR

- ☐ Fever (>100°F or >2°F above baseline)

AND at least one of the following symptoms that is new or worsening:

- ☐ Urgency
- ☐ Frequency
- ☐ Suprapubic pain
- ☐ Gross hematuria
- ☐ Costovertebral angle tenderness
- ☐ Urinary incontinence

For Residents With a Urinary Catheter or if Nonverbal

One or more of the following ***without another recognized cause***:

- ☐ Fever (>100°F or a 2°F increase from baseline)
- ☐ New costovertebral angle tenderness
- ☐ Rigors
- ☐ New-onset delirium*

**If adequate workup for other causes of delirium has been performed and no other cause for delirium is identified*

Assessment and Management of the Resident With a Suspected Urinary Tract Infection. Content last reviewed June 2021. Agency for Healthcare Research and Quality, Rockville, MD.

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What steps can the IP take to improve urine collection technique and prevent future contaminated cultures across the facility?

Think about staff training, collection protocols, and communication with nursing staff.

Urine Collection for Patients Without Catheters

Consider collecting urine after the resident has taken a bath, or use a sponge rinse with soap and water

Midstream clean-catch is the preferred method

In-and-out catheterization

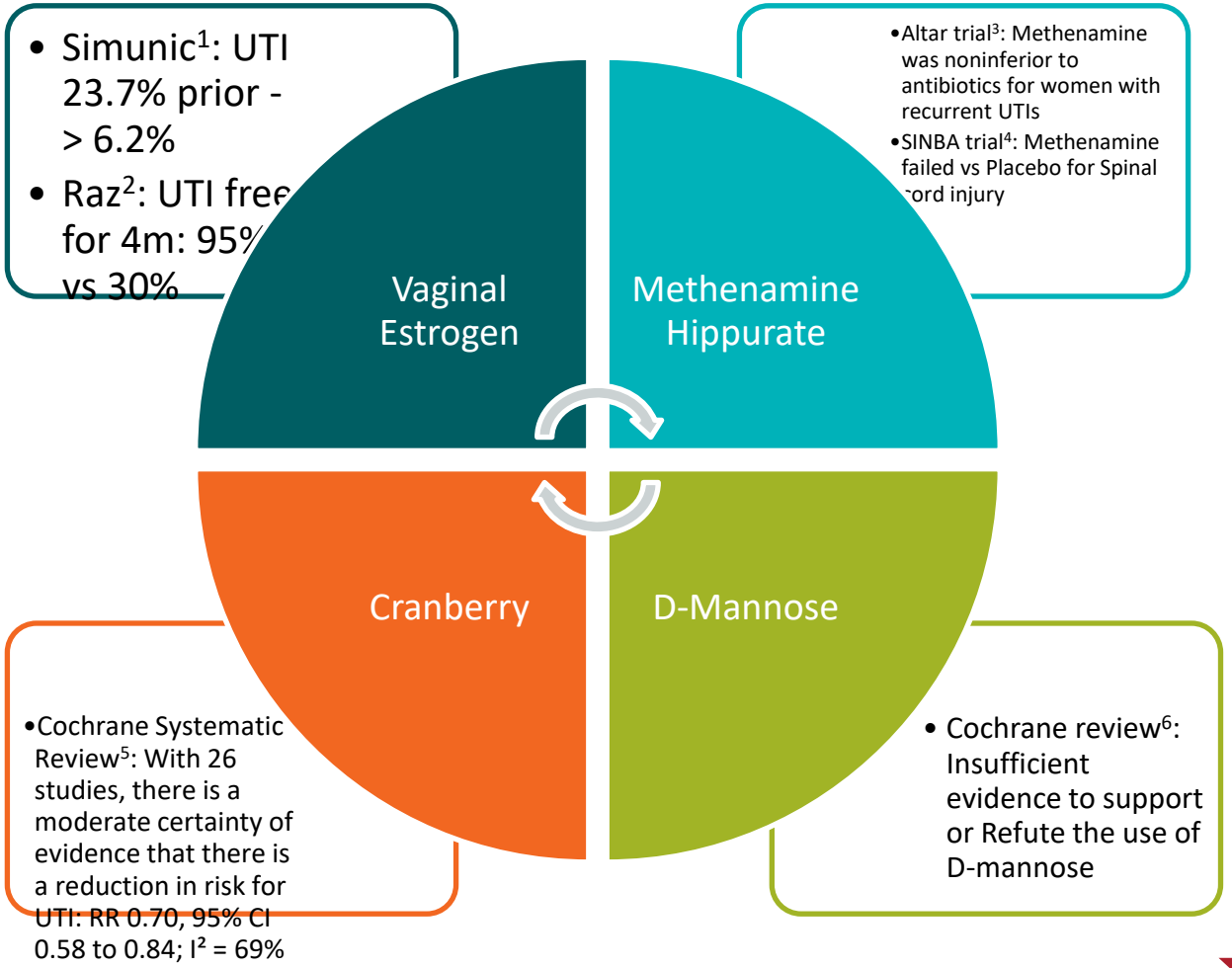
Clean genital area as described above

Perform catheterization using sterile technique

Alternative to in-and-out catheterization for men: place and obtain a specimen from a new condom catheter. Check the collection bag every 30 minutes

What infection prevention strategies could help reduce Mrs. Smith's risk of UTIs?

Think about non-antibiotic prevention strategies, hygiene practices, catheter use, and hydration.



PNEUMONIA PATIENT CASE

Mrs. Smith is now showing symptoms including a productive cough, shortness of breath, increased respiratory rate (26 breaths/min), and an oxygen saturation of 90% on room air. She is more confused than usual.

🔍 Assessment & Diagnosis

- What signs and symptoms suggest that Mrs. Smith may have developed pneumonia? *Consider Loeb minimum clinical criteria in residents with respiratory symptoms.*
- What diagnostics are needed? (chest X-ray, vital sign trends, sputum culture)
- How does her change in mental status factor into the assessment?

Residents with fever ≥102°F (38.9°C)

Criteria are met to initiate antibiotics if ONE of the following are selected:

No	Yes	
☐	☐	New or increased cough
☐	☐	New or increased sputum production
☐	☐	Respiratory rate ≥25 breaths/minute
☐	☐	O_2 sat <94% on room air or >3% decrease from baseline O_2 sat
☐	☐	New or changed lung exam abnormalities
☐	☐	Pleuritic chest pain

Residents with fever ≥100°F (37.9°C) but <102°F (38.9°C) or ≥2.4°F (1.5°C) above baseline temperature

Criteria are met to start antibiotics if BOTH of the following are selected:

No	Yes	
☐	☐	New or increased cough, AND
☐	☐	At least one of the following:
		☐ Pulse >100 beats / minute
		☐ New or worsened delirium
		☐ Rigors
		☐ Respiratory rate ≥25 breaths/minute

Afebrile resident with COPD and age >65 years old

Criteria are met to initiate antibiotic if BOTH of the following are selected:

No	Yes	
☐	☐	New or increased cough, AND
☐	☐	Purulent sputum production

Afebrile resident without COPD and age >65 years old

Criteria are met to initiate antibiotic if ALL of the following are selected:

No	Yes	
☐	☐	New or increased cough, AND
☐	☐	Purulent sputum production, AND
☐	☐	At least one of the following:
		☐ New or worsened delirium
		☐ Respiratory rate ≥25 breaths/minute

💊 Antibiotic Review & Selection

- Should we use the same antibiotic for pneumonia that was used for her previous UTI?
- What considerations are important when selecting empiric antibiotics for pneumonia in nursing home residents?

Assess for risk factors for infection with a multidrug-resistant organism. E.g., Recent exposure to antibiotics, recent admission to the hospital, known colonization

Beta-lactam therapy (amoxicillin-clavulanate, oral second or third-generation cephalosporins, ampicillin-sulbactam, or ceftriaxone)[3]

PLUS

azithromycin or doxycycline

Penicillin allergic:

moxifloxacin or levofloxacin

🔁 Treatment Re-evaluation

- Once diagnostic results are available (e.g., chest X-ray or sputum culture), how will the antibiotic plan be reassessed?
- Who is responsible for reviewing the new findings and making decisions about therapy adjustments?

PNEUMONIA PATIENT CASE, CONTINUED

Mrs. Smith improves on her antibiotic initally, but on day 4 she begins to worsen again with a constant cough. Staff have been pushing her to drink a lot of fluids throughout the day. The prescriber repeats the chest x-ray and sees worsening bilateral infiltrates.

📣 Communication & Documentation

- How should changes in Mrs. Smith's condition be communicated among the care team?
- What documentation should be included in the medical record to support clinical decisions?

📘 Education & Reflection

- What could we learn from this case about the importance of reassessing antibiotic therapy as a resident's condition changes?
- How would you share what was learned with other frontline staff members?
- How might overlapping or misdiagnosed infections lead to inappropriate antibiotic use?

SSTI PATIENT CASE

On monthly resident rounds, Mrs. Smith's provider noticed that her bilateral extremities are red, but not clearly demarcated. She reports swelling and mild pain. No fever, no leukocytosis. She says when the nurses elevate her legs the swelling improves.

- How should changes in Mrs. Smith's condition be communicated among the care team? *Consider Loeb minimum clinical criteria for initiating antibiotics in residents with SSTI*

- If Loeb criteria is not met, what non-infectious conditions should be considered before diagnosing and treating this as cellulitis? *Consider dependent edema, venous stasis dermatitis, or contact dermatitis.*

- Should empiric antibiotics be started at this time? Why or why not?

- Discuss risks of overdiagnosis of cellulitis and consequences of unnecessary antibiotics.

- What can be done to further evaluate or monitor the condition without immediately starting antibiotics? *Think about leg elevation, applying compression, marking erythema margins, or consulting wound care or dermatology*

- How can the infection preventionist contribute to reducing inappropriate diagnosis and treatment of cellulitis in the facility? What about the consultant pharmacist? *Consider staff education, case reviews, use of diagnostic criteria, and communication with providers.*

Thank you

jteranplasencia@unmc.edu

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