Using Data to Drive an Antimicrobial Stewardship Program

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Disclosures

- Nothing to disclose

Objectives

- Explain use of criteria to determine antimicrobial appropriateness

- Outline prescriber feedback letter templates based on appropriateness review

- Evaluate potential antibiotic use summary data for reporting to facility ASP / QAPI

- Understanding antimicrobial use data and what stewardship strategies to implement for example situations

Determining Antibiotic Appropriateness

- **Can be an intimidating task**
  - Suggesting inappropriateness may be uncomfortable
  - Majority is done in retrospect
  - Requires additional time

- **How to lower the hurdle**
  - Use pre-defined criteria (McGeer/Loeb)
  - Comfort will come with experience and practice

Antimicrobial Appropriateness Checklist

Utilize a standardized review process

What to evaluate?

- Clinical assessment
- Communication
- Antimicrobial course ordered
- Adverse drug events

Some lists already exist

- Revised McGeer criteria checklist
- Duration of therapy table
- Naranjo probability scale (for adverse events)

Appropriateness Checklist
Demographic data

Checklist for Antimicrobial Appropriate Assessment

Review Date: _____ Reviewed By: _____

Resident Demographics / History

Name: _____ MRN: _____ Location: _____

Age: _____ Weight: _____ Height: _____ Baseline creatinine: _____ CrCl: _____

Patient information from the past 90 days:
History of infection(S)?

☐Yes ☐No ☐Unknown

       If yes, type(s) of infection?

       ☐Urinary tract infection (UTI)   ☐Respiratory tract infection (RTI)

       ☐Skin and soft-tissue infection (SSTI)   ☐Gastrointestinal tract infection (GITI)

       ☐Others, please specify: _____

Appropriateness Checklist
Clinical Assessment

Clinical Assessment & Prescriber Communication

Type(s) of suspected infection [check all that apply]:

Urinary tract infection

☐UTI, without catheter, urine culture results available ☐UTI, without catheter, urine culture results <u>not</u> available

☐UTI, with catheter, urine culture results available ☐UTI, with catheter, urine culture results <u>not</u> available

Respiratory tract infection

☐Cold/pharyngitis ☐Influenza-like illness

☐Pneumonia ☐Bronchitis

McGeer criteria checklist

Urinary tract infection without catheter, urine culture results available

Urinary tract infection without catheter, urine culture results <u>not</u> available

Urinary tract infection with catheter, urine culture results available

Urinary tract infection with catheter, urine culture results <u>not</u> available

Respiratory tract infection

Skin and soft-tissue infection

Gastrointestinal infection

[Note that there are no criteria for the other suspected infection section]

Were McGeer criteria met based on pharmacist assessment?

☐Yes ☐No

Appropriateness Checklist
Communication

Was SBAR communication tool used?

☐Yes   ☐No   ☐Unknown

If yes, how was info on SBAR tool communicated to prescriber?

☐Face-to-face communication with prescriber   ☐Phone call based on SBAR

☐Faxed SBAR tool   ☐Info not communicated to prescriber

☐Unknown

Type of culture obtained (check all that apply)?

☐Urine   ☐Sputum culture   ☐Nasal swab for flu   ☐Throat swab

☐Skin swab   ☐Wound culture   ☐Stool for *C difficile* infection   ☐Stool culture

☐Blood culture   ☐Other, please specify: _____   ☐None

Was Chest X-Ray obtained?

☐Yes   ☐No

Appropriateness Checklist
Antimicrobial course

Antimicrobial Regimen

How many antibiotics are being reviewed for this patient? *[Drop down menu from 1 to 5]*

Where was this antibiotic started?

☐Outside the nursing home ☐At the nursing home

Antibiotic Name: *[Drop down menu or checkboxes for all antibiotics. Please also include oseltamivir, acyclovir, valacyclovir, fluconazole, itraconazole.*

Dose: __(free text)_____(g/mg/unit) *[For TMP/SMX (Bactrim), based dose on TMP component, e.g., SS = 80mg, DS = 160mg]*

Route: ☐PO ☐IM ☐IV

Frequency: ☐Daily/q24h ☐BID/q12h ☐TID/q8h

☐QID/q6h ☐Every other day/q48h ☐Every 3 days/q72h

☐Post-hemodialysis ☐Once ☐Other, please specify: _____

Duration originally ordered (days): _____

Duration resident actually received antibiotic (days): _____ *[Can get start and stop date to avoid duration calculation at time of data collection]*

Appropriateness Checklist
Appropriateness Assessment

Antimicrobial Appropriate Assessment

Is any of the following reason for inappropriateness present? (check all that apply):

☐ McGeer criteria not met

☐ Wrong antibiotic choice based on suspected infection (e.g., using moxifloxacin for UTI)

☐ Wrong antibiotic choice based on patient's infection and/or microbiology history from the past 90 days (e.g., history of pathogen resistant to antibiotic started)

☐ Wrong antibiotic choice based on patient's allergy and/or adverse drug reaction history (e.g., severe nausea due oral metronidazole)

☐ Wrong dose

☐ Wrong route

☐ Wrong frequency

☐ Wrong duration of therapy based on suspected infection (e.g., 14 days for uncomplicated cystitis)

☐ Pathogen(s) identified on culture not susceptible to antibiotic started (e.g., bug-drug mismatch)

☐ Significant drug-drug interaction (e.g., ciprofloxacin given at the same time as MOM or antacid)

☐ Other reason(s), please specify: _____

☐ None [antibiotic prescribed was appropriate]

Appropriateness Checklist
Revised McGeer Criteria

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 and 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

UTI with indwelling catheter	**Must fulfill both 1 AND 2.**
	☐ 1. At least one of the following sign or symptom
	  ☐ Fever, rigors, or new-onset hypotension, with no alternate site of infection
	  ☐ Either acute change in mental status or acute functional decline, with no alternate diagnosis and leukocytosis
	  ☐ New-onset suprapubic pain or costovertebral angle pain or tenderness
	  ☐ Purulent discharge from around the catheter or acute pain, swelling, or tenderness of the testes, epididymis, or prostate
	
	☐ 2. Urinary catheter specimen culture with ≥ 10^5 cfu/mL of any organism(s)
		• Recent catheter trauma, catheter obstruction, or new-onset hematuria are useful localizing signs that are consistent with UTI but are not necessary for diagnosis
		
		• Urinary catheter specimens for culture should be collected after replacement of the catheter if it has been in place >14 d

	☐ UTI criteria met	☐ UTI criteria **NOT** met

* Refer to original article (Stone ND, et al. Infect Control Hosp Epidemiol 2012;33:965-77) for full comments

Appropriate Durations of Therapy for UTI

Infectious Syndrome	Appropriate Duration of Therapy	
Uncomplicated Cystitis[1]	Nitrofurantoin	5 days
	TMP/SMX	3 days
	Fosfomycin	1 day
	Fluoroquinolones	3 days
	Beta-lactams	3-7 days
Pyelonephritis	Fluoroquinolones	7 days
	TMP/SMX	14 days
	Beta-lactams	10-14 days
Catheter-associated UTI or Complicated UTI[2]	Prompt Response	7 days
	Delayed response	10-14 days

1. Uncomplicated UTI is defined as genitourinary symptoms (i.e., dysuria, suprapubic pain or tenderness, frequency, or urgency) with evidence of pyuria plus bacteriuria in a structurally normal urinary tract.
2. Complicated UTI is defined as UTI occurring in a patient with structural or functional urinary tract abnormality.

Stevens DL, et al. Clin Infect Dis 2014;59:e10-52.Dworkin RH, et al. Clin Infect Dis 2007;44:s1-26.
Cohen SH, et al. Infect Control Hosp Epidemiol 2010;31:431-55.Guerrant RL, et al. Clin Infect Dis 2001;32"331-50.

Appropriate Durations of Therapy for Respiratory Tract Infections

Infectious Syndrome	Appropriate Duration of Therapy
Pneumonia	5-7 days
Bronchitis	Most cases viral, ABX likely not needed
Acute COPD Exacerbation	5 days
Streptococcal Pharyngitis	Up to 10 days for beta-lactam antibiotics 5 days for Azithromycin
Sinusitis	5-7 days if improvement after 3-5 days of therapy 7-10 days if delayed response

Mandell LA, et al. Clin Infect Dis 2007;44:S27-72.VA/DoD. Clinical practice guideline for management of COPD. 2014
Harper SA, et al. Clin Infect Dis 2009;48:1003-32.CDC. Interim guidance for influenza outbreak management in LTCF. 2017

Appropriate Duration of Therapy for Other Infections

Infectious Syndrome	Appropriate Duration of Therapy
Cellulitis or cutaneous abscess	5-7 days
Clostridium difficile infection	10-14 days PO vancomycin at first recurrence Tapered and pulsed PO vancomycin 10 days of fidaxomicin
Bacterial gastroenteritis	3-5 days

Stevens DL, et al. Clin Infect Dis 2014;59:e10-52.Dworkin RH, et al. Clin Infect Dis 2007;44:s1-26.
Cohen SH, et al. Infect Control Hosp Epidemiol 2010;31:431-55.Guerrant RL, et al. Clin Infect Dis 2001;32"331-50.

Appropriateness Checklist
Adverse Drug Events

Adverse Drug Events

Did patient develop adverse drug events as a result of antibiotic therapy?

☐Yes   ☐No

If yes, what adverse drug events (ADE) occurred?

☐Allergic reactions: anaphylaxis, rash, hives, pruritus

☐Neurologic ADE: seizure, altered mental status, peripheral neuropathy

☐Gastrointestinal ADE: diarrhea (not related to C difficile), nausea/vomiting

☐Hepatobiliary ADE: elevation in liver enzyme, elevation in total bilirubin

☐Renal ADE: serum creatinine >1.5X from baseline

☐Coagulation ADE: bleeding due supratherapeutic or blood clot due to subtherapeutic INR

☐Secondary infections: *C difficile* infection, infection from resistant pathogens

☐Other, please specify: _____

Naranjo Probability Scale

- Classify probability if ADR is related to drug therapy
- Score-based probability categories
  - \>8: definite
  - 5-8: probable
  - 1-4: possible
  - 0: doubtful

Naranjo Adverse Drug Reaction Probability Scale (with modifications)

The following scale is used to assess the likelihood a particular adverse reaction is related to a medication. Answer each of the 10 questions, calculate total score, and determine if an adverse drug reaction is Definitely, Probably, Possibly, or unlikely related to the drug in question. *(Interpretation of the probability classification can be found in Table 2 on the next page)*

Question	Yes	No	Do Not Know	Score
1. Are there previous CONCLUSIVE reports on this reaction? *Answer yes if 2 or more well-described case reports can be found in the literature*	+1	0	0	
2. Did the adverse reaction appear after the suspected drug was administered? *Answer yes if reaction occurs in close temporal relation (e.g., within 1-2 days) after drug administration*	+2	−1	0	
3. Did the adverse reaction improve when the drug was discontinued or a specific antagonist given? *Answer yes if reaction lessens or disappears after the suspect drug stops or a pharmacologic antagonist given*	+1	0	0	
4. Did the adverse reaction reappear when the drug was readministered? *Answer yes if reaction disappears after drug discontinuation but reappear when the drug was restarted*	+2	−1	0	
5. Are there alternative causes (other than the suspect drug) that could have caused the reaction? *Answer yes if the reaction can be explained by causes or medications other than the suspect drug*	−1	+2	0	
6. Did the reaction reappear when a placebo was given? *Answer yes if the reaction reappears after administration a placebo*	−1	+1	0	
7. Was the drug detected in blood or other fluids in concentrations known to be toxic? *Answer yes if drug concentration is in the toxic or supratherapeutic range*	+1	0	0	
8. Was the reaction more severe when dose was increased or less severe when dose was decreased? *Answer yes if the intensity of the reaction is stronger with higher dose or weaker with lower dose*	+1	0	0	
9. Did the patient have a similar reaction to the same or similar drugs in any previous exposure? *Answer yes if patient has a similar documented reaction when exposed to the suspect drug or related medication in the past*	+1	0	0	
10. Was the adverse reaction confirmed by any objective evidence? *Answer yes if the reaction can be confirmed by abnormal lab values, imaging, or physical examination*	+1	0	0	
Total Score				

Naranjo CA, et al. Clin Pharm Ther 1981;30:239-

Common Adverse Events Refresher

Table 1. List of Common Adverse Antimicrobial Reactions*

Drug Class	Class Member	Common Adverse Reaction
Penicillins +/- Beta-Lactamase Inhibitors	Ampicillin, Ampicillin-Sulbactam, Amoxicillin, Amoxicillin-Clavulanate, Cloxacillin, Dicloxacillin, Nafcillin, Oxacillin, Penicillin, Piperacillin-Tazobactam	Nausea, vomiting, diarrhea, *C difficile* infection, allergic reactions (including rash, hemolytic anemia), elevated serum creatinine, bone marrow suppression with long-term use, phlebitis with IV therapy
Cephalosporins +/- Beta-Lactamase Inhibitors	Cefaclor, Cefazolin, Cefdinir, Cefditoren, Cefepime, Cefixime, Cefotetan, Cefoxitin, Cefpodoxime, Cefprozil, Ceftaroline, Ceftazidime, Ceftazidime-Avibactam, Ceftibuten, Ceftolozane-Tazobactam, Ceftriaxone, Cefuroxime, Cephadroxil, Cephalexin	Nausea, vomiting diarrhea, *C difficile* infection, allergic reactions (including rash, serum sickness), altered mental status
Carbapenems	Doripenem, Ertapenem, Imipenem-Cilastatin, Meropenem	Nausea, vomiting, diarrhea, *C difficile* infection, seizure
Fluoroquinolones	Ciprofloxacin, Delafloxacin Levofloxacin, Moxifloxacin	Disorientation, delirium, agitation, seizure, hypo- or hyper-glycemia, peripheral neuropathy, tendon rupture, QT prolongation, nausea, vomiting, *C difficile* infection, increased in liver function tests, aortic dissection
Macrolides	Azithromycin, Clarithromycin, Erythromycin	Nausea, vomiting, elevation in liver function tests, reversible tinnitus or deafness, taste alteration, phlebitis with IV therapy
Tetracyclines	Doxycycline, Minocycline, Tetracycline	Nausea, vomiting, sunburn, esophageal ulcer, phlebitis with IV therapy, teeth discoloration
Sulfonamides	Sulfamethoxazole-Trimethoprim	Allergic reactions (rash, hives, drug fever, Steven Johnson Syndrome), headache, sunburn, hyperkalemia, worsen renal functions, bone marrow suppression, hemolytic anemia, hypoglycemia (especially with sulfonylureas)
Glycopeptides	Telavancin, Vancomycin IV	Redman syndrome (flushing, itching, hypotension), worsened renal functions
Others	Clindamycin, Metronidazole, Nitrofurantoin	All: Nausea, vomiting; Clindamycin: diarrhea, *C difficile* infection, taste alteration; Metronidazole: disulfiram reaction after alcohol (flushing, dyspnea), taste alteration, peripheral neuropathy, confusion; Nitrofurantoin: interstitial pneumonitis especially with chronic use, hemolytic anemia

* The above list does not include all antimicrobials or all adverse drug reactions. Consult drug references and published literature for additional information if an adverse drug reaction not listed above is suspected.

Medication Regimen Review Recommendations

Duration of Therapy Letters

Be helpful with recommendations

Recommend discontinuation or adjustment of duration for currently active orders

Provide opportunity to justify duration prescribed if therapy completed

Remember providers want to do best by their patients

If provider is receptive to references

Cite IDSA guidelines as reference

Complicated UTI is tricky

No specific guideline available

Utilize Catheter-associated UTI guideline as closest scenario

Duration of Therapy Letters

This resident received **10 days of Bactrim DS twice daily for treatment of cystitis (11/13-11/23).** Based on current guidelines from Infectious Diseases Society of America for treatment of cystitis, this resident received longer duration than the recommended 3 days. Please take this into consideration if the resident needs to be treated for this infection in the future.

☐ Antibiotic duration of therapy was longer than recommended due to [please provide reason below]:

Reference:

Gupta K, *et al.* International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis 2011;52:e103-20.

TMP/SMX: "Trimethoprim-sulfamethoxazole (160/800 mg [1 double-strength table] twice-daily for 3 days) is an appropriate choice for therapy…" (p. e105)

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Clinical Criteria Not Met Letters

Use non-confrontational language

Instead of "this resident did not meet criteria"

Use "According to documentation available upon review, this resident may not have met criteria"

These recommendations are most useful if standardized assessment tool (SBAR) is utilized

If lack of nursing documentation in the medical record, then use as opportunity to highlight the positives of an SBAR intervention

Clinical Criteria Not Met Letters

This resident was receiving **Cephalexin 500mg BID which was then switched to Nitrofurantoin 100mg BID x7 days (12/5-12/12) prescribed for <u>UTI without an indwelling catheter</u>.** Based on the revised McGeer Criteria for suspected UTI without an indwelling catheter, and charting available upon review at ~~_____~~ this resident did not meet any 1 of the following 3 scenarios required (in addition to positive urine culture) for the diagnosis of UTI:

- Any of the following two:
  - Acute dysuria alone
  - Acute pain, swelling or tenderness of the scrotal area
- Fever and at least one new or worsening of the following:
  - Urgency   Suprapubic pain
  - Frequency   Gross hematuria
  - Back or flank pain   Urinary incontinence
- No fever but two or more of the following:
  - Urgency   Suprapubic pain
  - Frequency   Gross hematuria
  - Urinary incontinence

Treatment is not recommended for asymptomatic bacteriuria unless a GU procedure is planned.

☐ Antibiotic therapy for UTI was indicated for this resident due to [please provide reason below]:

Reference:

Stone ND, *et al*. Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGeer Criteria. Infect Control Hosp Epidemiol 2012;33:965-77.

Nicolle LE, *et al*. Infectious Diseases Society of America Guidelines for the Diagnosis and Treatment of Asymptomatic Bacteriuria in Adults. Clin Infect Dis 2005;40:643-54.

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Microbiology Criteria Not Met or Bug Drug Mismatch Letters

Current therapy recommendations

Not meeting microbiologic criteria

• Suggest discontinuation

Meeting criteria but organism not sensitive to prescribed antibiotics

• Has resident improved? -> suggest discontinuation as no utility of current tx

• Resident the same or worse? -> suggest change based on C&S

Completed therapy recommendations

Did resident recover? -> suggest no further antibiotics

Resident the same or worse? -> suggest re-evaluation and possible treatment options based on previous C&S

Microbiology Criteria Not Met or Bug Drug Mismatch Letters

This resident was receiving Bactrim DS twice daily for 3 days (8/29 PM -9/1 AM) prescribed for UTI without an indwelling catheter. The urine culture results shows growth of *Proteus mirabilis*, which is resistant to the abovementioned antibiotics.

> The resident now has been off antibiotics for almost 3 weeks and per chart documentation the resident has no symptoms of UTI suggesting that previous symptoms may not have have been related to UTI.

☐ AGREE, ***no need for additional antibiotics / will do further evaluation***

☐ DISAGREE. Please specify reason:

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Other Common Scenarios

Fluoroquinolone as first line

This resident received an order for Ciprofloxacin 500mg twice a day for 7 days for UTI on 1/24/23. Based on current guidelines from Infectious Diseases Society of America for treatment of cystitis, Fluoroquinolone agents are considered high risk therapy for cystitis due to the relatively high adverse effects associated with their use. Urine culture reported the next day showed an organism resistant to Fluoroquinolones and the order was changed. If this resident was prescribed a Fluoroquinolone for a specific purpose, please notate the reason below. Otherwise, Nitrofurantoin is a good first line choice for treating Cystitis. Please take this into consideration if the resident needs to be treated for this infection in the future. Thank you.

☐ Ciprofloxacin was chosen over first line agents due to the following: [please provide reason below]:

_____

☐ Above information noted

Reference:
Gupta K, et al. International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis 2011;52:e103-20.

Fluoroquinolones: "The fluoroquinolones, ofloxacin, ciprofloxacin, and levofloxacin, are highly efficacious in 3-day regimens but have a propensity for collateral damage and should be reserved for important uses other than acute cystitis and thus should be considered alternative antimicrobials for acute cystitis." (p. e105)

UTI Prophylaxis

This resident is currently receiving CEPHALEXIN 250MG Qday for UTI prophylaxis. Please note that the Infectious Diseases Society of America discourages the use of prophylactic antibiotics for UTI in most cases. In January, resident did have a urine culture that showed a E. Coli that was resistant to 1st generation cephalosporins, indicating that this agent may no longer be effective in preventing future infections. Do you feel that it would be appropriate to attempt discontinuation at this time? If not, please provide clinical rationale and indicate how often you would like this medication reviewed for continued appropriateness. Thank you.
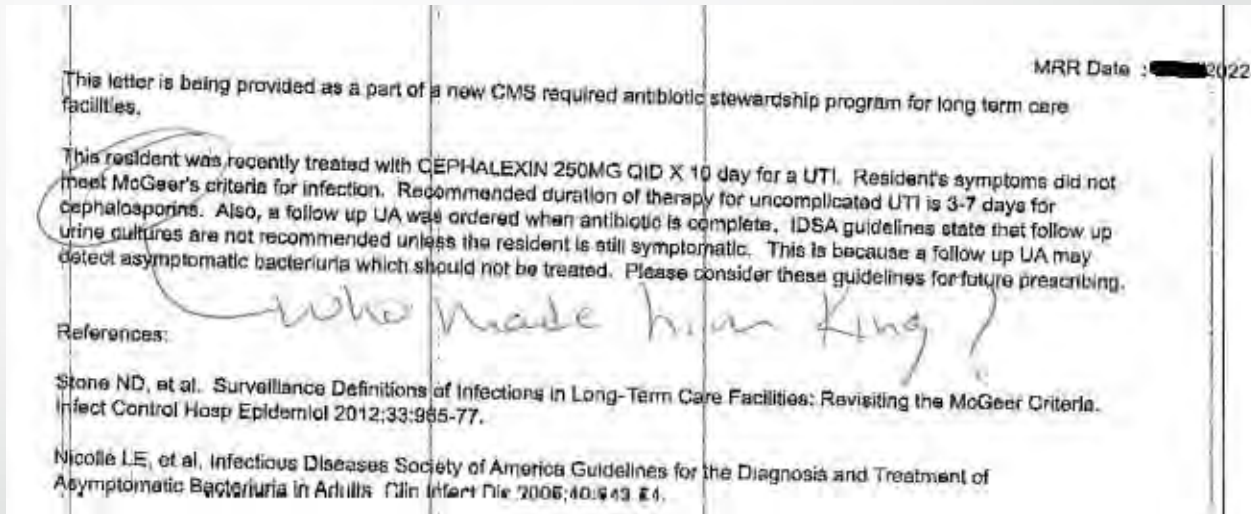
___ Discontinue Cephalexin

___ Continue Cephalexin at this time. Re-evaluate: ___ in 6 months; ___ in one year

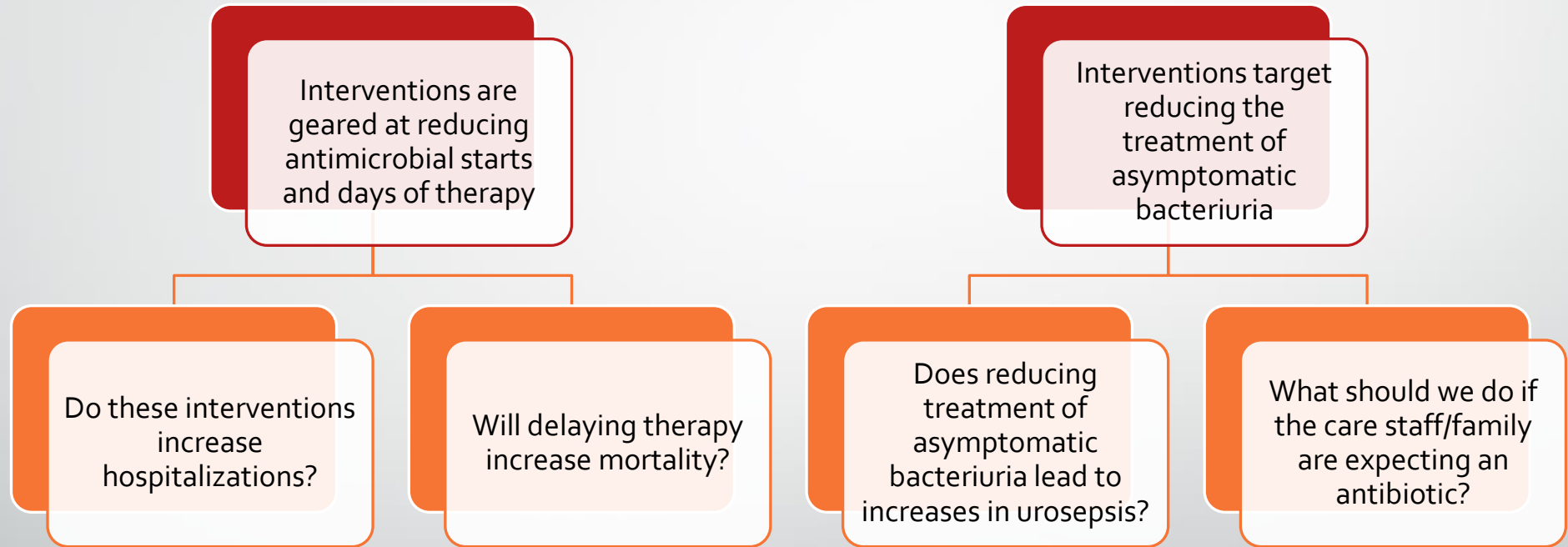Clinical rationale for continuing Cephalexin for prophylaxis:

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Barriers to Successful Implementation

Barrier	2018 (N=34)	2019 (N=25)	p-Value
Lack of appropriate antibiotic prescribing or lack of ASP buy-in by clinicians	25 (73.5%)	15 (60.0%)	0.40
Family/Resident pressure	7 (20.6%)	11 (44.0%)	0.09
Lack of staff buy-in	11 (32.4%)	8 (32.0%)	1.00
Time constraint	2 (5.9%)	6 (24%)	0.06
Emergency department not prescribing antibiotics appropriately	4 (11.7%)	1 (4.0%)	0.38
Lack of infrastructure	5 (14.7%)	3 (12.0%)	1.00
Lack of staff knowledge	5 (14.7%)	1 (4.0%)	0.23
Difficulties in educating staff, physicians, and families	2 (5.9%)	2 (8.0%)	1.00
Lack of leadership buy-in	1 (2.9%)	1 (4%)	1.00
Lack of standard processes	0 (0.0%)	2 (8.0%)	0.18
Others (include those barriers that were reported by only one respondent)	6 (17.6%)	4 (16.0%)	1.00

This letter is being provided as a part of a new CMS required antibiotic stewardship program for long term care facilities.

This resident was recently treated with CEPHALEXIN 250MG QID X 10 day for a UTI. Resident's symptoms did not meet McGeer's criteria for infection. Recommended duration of therapy for uncomplicated UTI is 3-7 days for cephalosporins. Also, a follow up UA was ordered when antibiotic is complete. IDSA guidelines state that follow up urine cultures are not recommended unless the resident is still symptomatic. This is because a follow up UA may detect asymptomatic bacteriuria which should not be treated. Please consider these guidelines for future prescribing.

References:

Stone ND, et al. Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGeer Criteria. Infect Control Hosp Epidemiol 2012;33:965-77.

Nicolle LE, et al. Infectious Diseases Society of America Guidelines for the Diagnosis and Treatment of Asymptomatic Bacteriuria in Adults. Clin Infect Dis 2005;40:643-54.

Ferguson, Claire et al. "132. Assessment of the Long-Term Effects of Training Consultant Pharmacists to Promote Antimicrobial Stewardship in Long-Term Care Facilities." Open Forum Infectious Diseases vol. 7,Suppl 1 S77–S78. 31 Dec. 2020, doi:10.1093/ofid/ofaa439.177

Common Pushback Questions

Interventions are geared at reducing antimicrobial starts and days of therapy

Do these interventions increase hospitalizations?

Will delaying therapy increase mortality?

Interventions target reducing the treatment of asymptomatic bacteriuria

Does reducing treatment of asymptomatic bacteriuria lead to increases in urosepsis?

What should we do if the care staff/family are expecting an antibiotic?

Data available from literature is on your side!

Hospitalizations and Mortality

- 2021 Meta-analysis of LTCFs with and without ASPs

    - Mean difference of 0.17 hospital admissions per 1000 resident-days in facilities with ASP (not statistically significant)

    - Mean difference of -0.02 deaths per 1000 resident-days with ASP (not statistically significant)

4. Crespo-Rivas JC et al. Are antimicrobial stewardship interventions effective and safe in long-term care facilities? A systematic review and meta-analysis. Clin Microbiol Infect. 2021 Oct;27(10):1431-1438. doi: 10.1016/j.cmi.2021.06.003. Epub 2021 Jun 10. PMID: 34118423.

Asymptomatic Bacteriuria

- New study published in March of 2024

- 5 year, 68 hospital cohort study with a total of 11,590 cases of asymptomatic bacteriuria evaluated.

- Median Age of 78.2, (range of 67.7-86.6)

- Only 1.4% of the 11590 cases resulted in bacteremia

- Further stratified to patients with altered mental status (2126) and only 0.7% of those developed bacteremia

5. Advani SD, Ratz D, Horowitz JK, et al. Bacteremia From a Presumed Urinary Source in Hospitalized Adults With Asymptomatic Bacteriuria. *JAMA Netw Open.* 2024;7(3):e242283. doi:10.1001

Summarizing Antibiotic Use Data

Data Collected While Reviewing for Appropriateness

- Number of antibiotic courses in a month (minus any discharged residents)

- How many assessment/SBAR tools used

- Total number of inappropriate antibiotic orders

- Total number of antibiotic related adverse events

How to Present This Data

Number of antibiotic starts or Days of therapy per 1000 resident days	% of antibiotic starts where SBAR tool was utilized
% of antibiotic courses that were inappropriate	% of antibiotic courses that resulted in adverse events

Getting More Specific
Example: ASP identifies UTI as Primary Issue

- Number of antibiotic courses for UTI in a month

- How many UTI assessment/SBAR tools used

- Total number of inappropriate antibiotic orders for UTI

- Total number of antibiotic related adverse events resulting from UTI treatment

- Number of antibiotic starts or Days of therapy due to UTI treatment per 1000 resident days

- % of antibiotic starts where UTI SBAR tool was utilized

- % of antibiotic courses for UTI that were inappropriate

- % of antibiotic courses for UTI that resulted in adverse events

Example Summary Data from MRR Appropriateness Assessments

MRR Pharmacist Appropriateness Assessment-2021

	QUARTER 1 (DEC – JAN - FEB)	QUARTER 2 (MAR – APR - MAY)	QUARTER 3 (JUNE – JULY – AUGUST)	QUARTER 4 (SEPTEMBER – OCTOBER - NOVEMBER)
# OF ANTIBIOTICS REVIEWED	35	45	49	
# STARTS FROM OUTSIDE FACI	15	27	29	
# STARTS IN FACI	20	18	20	
% APPROPRIATE (OVERALL)	69%	92%	88%	%
% INAPPROPRIATE (OVERALL)	31%	8%	12%	%
% APPROPRIATE (STARTED AT FACI)	45%	78%	70%	%
% INAPPROPRIATE (STARTED AT FACI)	55%	22%	30%	%
% UTI (OVERALL)	60%	42.2%	44.9%	%
% UTI (STARTED AT FACI)	70%	56%	70%	%
% SSTI (STARTED AT FACI)	30%	33%	30%	%
%UTI SBAR UTILIZED (FACI STARTS ONLY)	71%	80%	71%	%
# ADVERSE EVENTS	0	2 (GI)	0	
MOST COMMON REASON FOR INAPPROPRIATE THERAPY	McGeer Criteria Not Met	McGeer Criteria Not Met	McGeer Criteria Not Met	

Other Useful Information To Track

Prescriber-Specific Data
Stratify appropriateness data by provider

Staff-Specific Data
If specific staff members having issues with SBAR usage

Compliance with prescribing documentation (dose, duration, indication)
Help IP with identifying education needs

Hospitalization Rate
Correlations with antibiotic use data may justify stewardship practices

Turning Data Into Action

Low compliance with prescription documentation

- Provider education
- Policy to enforce or reinforce compliance
- If verbal order, implement process to obtain all required information

Low compliance with assessment / SBAR tool use

- Nursing staff education
- One-on-one feedback
- Evaluate Ease-of-use of tools

High rates of infections

- Alert Infection Preventionist (IP)
- Examine infection control practices
- Review urinary catheter cares, wound cares, peri cares, etc

Turning Data Into Action

High Frequency of antibiotic starts not meeting criteria

- Nursing education on tools
- Prescriber education on appropriate criteria
- Medical director involvement if necessary

Duration of therapy longer than necessary

- Prescriber education
- Facility treatment guidelines
- Implement antibiotic time-out tool
- Medical director involvement if necessary

High rate of bug-drug mismatch

- Prescriber education on antibiogram
- Facility treatment guidelines

Turning Data Into Action

High rates of hospitalization

- Examine reasons: infectious vs. non-infectious causes
- If infectious:
  - Review antibiotic request, med administration procedures
  - Review empiric antibiotic use
  - Review adverse event rates

High resistance rates for certain antibiotics

- Review use of the antibiotic in question
  - Remove antibiotic from any facility guidelines

Questions?

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