

1 APPENDIX

2 Figure A

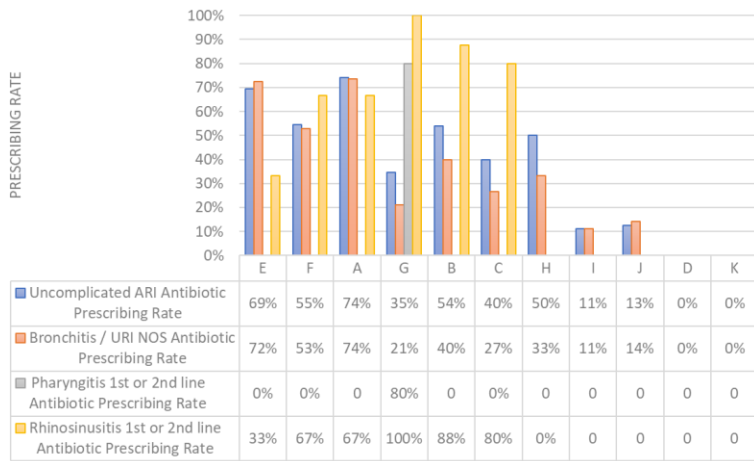
3 Front

OUTPATIENT ANTIMICROBIAL STEWARDSHIP REPORT CARD

How does your antibiotic prescribing for common infections compare to your peers?

Dr. {BLANK} your identifier is

A



4

QUICK FACTS

- 70% of patients with rhinosinusitis improve on their own
- ~15% of pharyngitis cases may benefit from antibiotics
- 90% of acute bronchitis cases are caused by viruses
- 100% of cases of the common cold (or URI-NOS) are caused by viruses

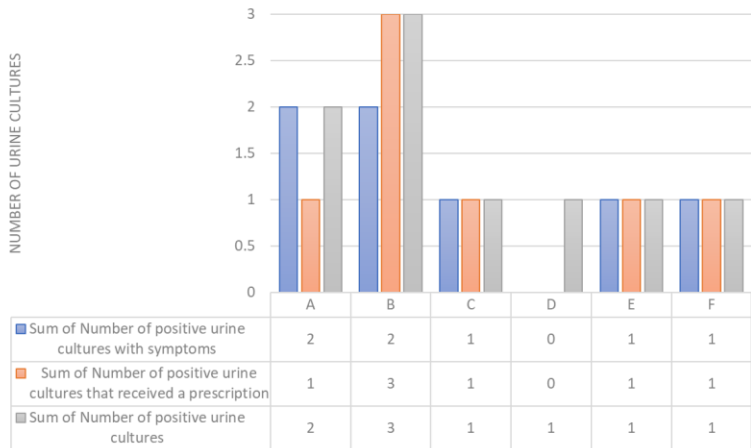
5 Back

OUTPATIENT ANTIMICROBIAL STEWARDSHIP REPORT CARD

How does your antibiotic prescribing for common infections compare to your peers?

Dr. {BLANK} your identifier is

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QUICK FACTS

- Bacteriuria should not be treated in the absence of symptoms
- 100% of catheterized patient's will become colonized within 2 weeks
- Cloudy/foul smelling urine alone is not an indication to treat

6

7 Figure B

Just say no!
to unnecessary antibiotics

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Objectives

- Review appropriate therapy for acute respiratory infections
- Review appropriate screening & therapy for urinary tract infections
- Discuss strategies to discuss stewardship with patients

Background

ANTIBIOTICS: THE GOOD, THE BAD, THE UGLY

- 👍
Effective treatment for many bacterial illnesses (for now)
- 👎
> 50% of antibiotic prescriptions are inappropriate
- 🤮
Adverse effects, C diff diarrhea, antimicrobial resistance

8

Acute Respiratory Infections

RHINOSINUSITIS

Acute rhinosinusitis (ARS)
Up to 4 weeks of purulent nasal discharge accompanied by nasal obstruction, facial pain-pressure-fullness, or both



Reynolds DR, Phillips JF, Choudhry R, Boud L, Ashok Kumar C, Egan M, O'Connell M, Pines A, Winkler SA, Cortezano MG. Clinical practice guideline (update): rhinosinusitis. *Obstetrical & Gynecological Survey*. 2015 Apr; 60(4):201-208. doi: 10.1177/0898010114528297. Published online 2014.

VIRAL RHINOSINUSITIS

Symptoms or signs of acute rhinosinusitis are present less than 10 days and the symptoms are not worsening

Headache

- Ibuprofen 200-400mg PO Q4-6h x 7 days
- Naproxen 500mg PO Q12h x 7 days
- Acetaminophen 650-1000mg PO Q4-6h (max: 4000mg/day) x 7 days

Cough

- Dextromethorphan 30mg PO Q4-6h x 7 days
- Oxalresin IR 200-400mg PO Q4h x 7 days
- Benzocaine 100-300mg PO Q4-12h x 7 days
- Albuterol Inhaler (if wheezing present) 2 Inhalations Q4-6h x 7 days

Nasal Congestion

- Saline Nasal Spray or Nasal Irrigation x 7 days
- Phenylephrine 10-30mg PO Q4h x 7 days
- Oxymetazoline Nasal Spray 2-3 sprays in each nostril BID (duration <3 days) x 7 days
- Fluticasone Nasal Spray 2 sprays in each nostril daily x 7 days

Rhinorrhea and/or sneezing

- Diphenhydramine 25 mg PO QHS x 7 days
- Cromolyn Nasal Solution 1 spray per in each nostril 3-6 times/day x 7 days
- Ipratropium Nasal Solution 2 sprays in each nostril 3 times per day x 7 days

ACUTE BACTERIAL RHINOSINUSITIS

symptoms or signs of acute rhinosinusitis fail to improve within 10 days or more beyond the onset of upper respiratory symptoms OR symptoms or signs of acute rhinosinusitis worsen within 10 days after an initial improvement (double worsening)

No penicillin allergy	Amoxicillin/clavulanate 875 mg/125 mg PO BID x 5 days
Non-severe penicillin allergy	Cefpodoxime 200 mg PO BID x 5 days
Severe Penicillin allergy	Doxycycline 100 mg PO BID x 5 days
Symptomatic treatment	See VRS for treatment

Reynolds DR, Phillips JF, Choudhry R, Boud L, Ashok Kumar C, Egan M, O'Connell M, Pines A, Winkler SA, Cortezano MG. Clinical practice guideline (update): rhinosinusitis. *Obstetrical & Gynecological Survey*. 2015 Apr; 60(4):201-208. doi: 10.1177/0898010114528297. Published online 2014.

9

PHARYNGITIS

- Fever
- Cervical lymphadenopathy
- Tonsillar exudate
- Absence of cough

Rapid Strep Test +	Rapid Strep Test -
Antimicrobial Treatment +/- symptomatic treatment	Symptomatic Treatment ONLY
No penicillin allergy	Headache, and/or muscle/joint pain
Penicillin VK 500 mg PO BID x 10 days OR Amoxicillin 500 mg PO BID x 10 days	Ibuprofen 200-400mg PO Q4-6h x 7 days Naproxen 500mg PO Q12h x 7 days Acetaminophen 650-1000mg PO Q4-6h (max: 4000mg/day) x 7 days
Non-severe penicillin allergy	Throat Discomfort
Cephalexin 500 mg BID PO x 10 days	Menthol Throat Lozenges x 7 days Painful Throat Spray x 7 days
Severe penicillin allergy	Nasal congestion
Clindamycin 300 mg PO TID x 10 days	Saline Nasal Spray or Nasal Irrigation x 7 days Phenylephrine 10-30mg PO Q4h x 7 days Oxymetazoline Nasal Spray 2-3 sprays in each nostril BID (duration <3 days) x 7 days Fluticasone Nasal Spray 2 sprays in each nostril daily x 7 days
Symptomatic treatment for the following (See under Rapid Strep Test -)	Rhinorrhea and/or sneezing
- Headache	Diphenhydramine 25 mg PO QHS x 7 days
- Throat discomfort	Cromolyn Nasal Solution 1 spray per in each nostril 3-6 times/day x 7 days
- Nasal congestion	Ipratropium Nasal Solution 2 sprays in each nostril 3 times per day x 7 days
- Rhinorrhea and/or sneezing	

ACUTE BRONCHITIS

Cough lasting 3 weeks
Chest radiograph ruled out pneumonia if HR > 100 beats/minute respiratory rate > 24 breaths/min and temperature > 100.4 F

Headache and/or muscle/joint pain	Nasal Congestion
Ibuprofen 200-400mg PO Q4-6h x 7 days Naproxen 500mg PO Q12h x 7 days Acetaminophen 650-1000mg PO Q4-6h (max: 4000mg/day) x 7 days	Saline Nasal Spray or Nasal Irrigation x 7 days Phenylephrine 10-30mg PO Q4h x 7 days Oxymetazoline Nasal Spray 2-3 sprays in each nostril BID (duration <3 days) x 7 days Fluticasone Nasal Spray 2 sprays in each nostril daily x 7 days
Cough	Rhinorrhea and/or sneezing
Dextromethorphan 30mg PO Q4-6h x 7 days Oxalresin IR 200-400mg PO Q4h x 7 days Benzocaine 100-300mg PO Q4-12h x 7 days Albuterol Inhaler (if wheezing present) 2 Inhalations Q4-6h x 7 days	Diphenhydramine 25 mg PO QHS x 7 days Cromolyn Nasal Solution 1 spray per in each nostril 3-6 times/day x 7 days Ipratropium Nasal Solution 2 sprays in each nostril 3 times per day x 7 days

Urinary Tract Infections & Asymptomatic Bacteriuria

URINARY TRACT INFECTIONS MYTHBUSTERS

Reasons to treat for UTI

Cloudy, smelly urine **MYTH** **TRUTH** Should not be used alone

TOP TEN MYTHS REGARDING THE DIAGNOSIS AND TREATMENT OF URINARY TRACT INFECTIONS

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Candida in the urine **MYTH** **TRUTH** Usually a colonizer

10

TOP TEN MYTHS REGARDING THE DIAGNOSIS AND TREATMENT OF URINARY TRACT INFECTIONS

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ORDERING UAs

When to order Urinalysis + Treat Asymptomatic Bacteriuria Based on C+S Results

DO ORDER + TREAT for	DON'T ORDER + TREAT for
<ul style="list-style-type: none"> ✓ Pregnant women ✓ Patients undergoing endourological procedures 	<ul style="list-style-type: none"> × Healthy non-pregnant women × Functionally impaired adults (community or LTCF) × Patients with diabetes × Solid organ transplant other than kidney × Spinal Cord Injury × Patients with short-term (<30 days) urethral catheters × Patients undergoing elective nonurological surgery × Patients with implanted urologic devices

UNCOMPLICATED URINARY TRACT INFECTION

SYMPTOMS	TREATMENT	URATION
Acute Uncomplicated Cystitis syndrome involving dysuria, frequency, urgency, and sometimes suprapubic tenderness.	Nitrofurantoin 100 mg PO BID OR Trimethoprim-sulfamethoxazole BID OR Cefpodoxime 300 mg PO BID	MALE 7 days 7 days 7 days
Acute Uncomplicated Pyelonephritis Flank pain, tenderness, and fever, sometimes associated with dysuria, urgency and frequency	Ciprofloxacin 500 mg PO BID OR Trimethoprim-sulfamethoxazole PO BID OR 1 g IV Ceftriaxone IM/IV once then cefpodoxime 300 mg PO BID x 14 days	FEMALE 7 days 14 days 14 days

Test of cure urine cultures NOT recommended by IDSA guidelines

Complicated presence of factors that predispose to persistence or relapsing infection, such as foreign bodies (e.g., catheter), obstructing pathology or other drainage devices; obstruction; immunosuppression; renal failure; renal transplantation; and urinary retention from neurologic disease
Patients with high grade fever, rigors or chills, hemodynamic instability, or other signs of sepsis should be admitted to the hospital for IV antibiotics.

Patient Education Strategies

11

PATIENT EDUCATION

- Patient education pamphlets
- CDC watch & wait prescriptions
- Provide symptomatic treatment as an alternative



PATIENT SCENARIO



“Hey doc, I’ve been stuffed up and leaking green goo for 3 days. Not to mention this terrible headache I’ve got. I need to get better so I can take care of my grandkids. Usually I take some Augmentin and feel all better but I got none left. What do ya say doc? Hit me will a refill?”

PATIENT SCENARIO







“Mr. Runny, it sounds as though you have rhinosinusitis. More than 90% of these infections are caused by viruses, which antibiotics (like Augmentin) do not kill. Unfortunately we don’t have good medications to kill viruses yet, but these usually resolve on their own.”

PATIENT SCENARIO



“No offense doc, but I know my body. Augmentin always works. Just give me that, I didn’t drive all the way down here to leave with nothing!”

12

<p>PATIENT SCENARIO</p>  <p>"I understand you're not feeling well and I want you to feel better too. Many times viral illnesses resolve within 10 days... let me guess you took that Augmentin within that time frame? You could have had an infection caused by a bacteria but it is much more likely the virus was just killed off by your strong immune system!"</p>	<p>PATIENT SCENARIO</p>  <p>"It's also important for you to understand that antibiotics aren't harmless. They can cause many side effects such as upset stomach, nausea and diarrhea, a very serious super bug infection called C diff and they make it less likely that antibiotics will continue to work in the future the more we use them."</p>
<p>PATIENT SCENARIO</p>  <p>"I wouldn't be doing my job if I gave you a medication that I knew could cause you harm and no benefit! I do however, want you to feel better, so let me give some prescriptions that will help you feel better while your immune system fights off that virus!"</p>	<p>PATIENT SCENARIO</p>  <p>"My dear friend Gerald died from C diff infection... I didn't realize that was from antibiotics. Alright doc you got a deal, bring on the goodies!"</p>

13

	<p>WHAT CAN YOU DO?</p> <ul style="list-style-type: none"> Utilize physician pocket cards for appropriate therapy Utilize antimicrobial CDS for ARI Assess each patient for antimicrobial appropriateness Educate patients about appropriate antimicrobial use Hang CDC posters in your exam rooms Provide patients with symptomatic treatment Provide patients with educational materials 
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14

15 Figure C

GUIDELINES FOR THE EMPIRIC THERAPY & TREATMENT OF COMMON OUTPATIENT INFECTIONS



Created by: Grace Mortrude, PharmD
ZVAMC Antimicrobial Stewardship Task Force
Last updated: November 2019

RHINOSINUSITIS

Acute rhinosinusitis (ARS): Up to 4 weeks of purulent nasal drainage (anterior, posterior, or both) accompanied by nasal obstruction, facial pain/pressure/fullness, or both

- Purulent nasal discharge is cloudy or colored. In contrast to the clear secretions that typically accompany viral upper respiratory infection and may be reported by the patient or observed on physical examination.
- Nasal obstruction may be reported by the patient as nasal obstruction, congestion, blockage, or stuffiness, or may be diagnosed by physical examination.
- Facial pain/pressure/fullness may involve the anterior face, periorbital region, or manifest with headache that is localized or diffuse.

SYNDROME	TREATMENT
VRVIAL RHINOSINUSITIS (VRS) Symptoms or signs of acute rhinosinusitis are present less than 10 days and the symptoms are not worsening	Symptomatic Treatment ONLY Headache Ibuprofen 200-400mg PO Q4-6h x 7 days Naproxen 500mg PO Q12h x 7 days Acetaminophen 650-1000mg PO Q4-6h (max: 4000mg/day) x 7 days Cough Dextromethorphan 30mg PO Q4-6h x 7 days Guaifenesin IR 200-400mg PO Q4h x 7 days Benzonate 100-200mg PO Q8-12h x 7 days Albuterol Inhaler (if wheezing present) 2 inhalations Q4-6h x 7 days Nasal congestion Saline Nasal Spray or Nasal Irrigation x 7 days phenylephrine 10-20mg PO Q4h x 7 days Oxymetazoline Nasal Spray 2-3 sprays in each nostril BID (duration <3 days) x 7 days Fluticasone Nasal Spray 2 sprays in each nostril daily x 7 days Rhinorrhea and/or sneezing Diphenhydramine 25 mg PO QHS x 7 days Cromolyn Nasal Solution 1 spray per in each nostril 3-6 times/day x 7 days Ipratropium Nasal Solution 2 sprays in each nostril 3 times per day x 7 days
ACUTE BACTERIAL RHINOSINUSITIS (ABRS) Symptoms or signs of acute rhinosinusitis fail to improve within 10 days or more beyond the onset of upper respiratory symptoms OR symptoms or signs of acute rhinosinusitis worsen within 10 days after an initial improvement (double worsening)	Antimicrobial Treatment +/- symptomatic treatment No penicillin allergy Amoxicillin (or amoxicillin-clavulanate 875 mg/125 mg PO BID x 5 days) Non-severe penicillin allergy (e.g. mild rash) Cefpodoxime 200 mg PO BID x 5 days Severe penicillin allergy (e.g. anaphylaxis) Doxycycline 100 mg PO BID x 5 days Symptomatic treatment: See options for symptomatic treatment above for: - Headache - Cough - Nasal congestion - Rhinorrhea and/or sneezing

REFERENCES:
1. Rosenfeld RM, Piccirillo JF, Chandrasekhar SS, Brook I, Ashok Kumar K, Krampner M, Orlandi RR, Palmer JN, Patel ZM, Peters A, Walsh SA, Corrigan MD. Clinical practice guideline (update): adult sinusitis. Otolaryngol Head Neck Surg. 2015 Apr;152(1 Suppl):S1-S39. doi: 10.1177/0149499815572097. PubMed PMID: 25832966.

PHARYNGITIS

SYNDROME	TREATMENT
Signs and Symptoms - Fever - Cervical lymphadenopathy - Tonsillar exudate - Absence of cough	Rapid Strep Test + Antimicrobial Treatment +/- symptomatic treatment No penicillin allergy Penicillin VK 500 mg PO BID x 10 days OR Amoxicillin 500 mg PO BID x 10 days Non-severe penicillin allergy Doxycycline 100 mg PO BID x 10 days Severe penicillin allergy Clindamycin 300 mg PO TID x 10 days
	Rapid Strep Test - Symptomatic Treatment ONLY Headache, and/or muscle/joint pain Ibuprofen 200-400mg PO Q4-6h x 7 days Naproxen 500mg PO Q12h x 7 days Acetaminophen 650-1000mg PO Q4-6h (max: 4000mg/day) x 7 days Throat Discomfort Menthol Throat Lozenges x 7 days Phenol Throat Spray x 7 days Nasal congestion Saline Nasal Spray or Nasal Irrigation x 7 days phenylephrine 10-20mg PO Q4h x 7 days Oxymetazoline Nasal Spray 2-3 sprays in each nostril BID (duration <3 days) x 7 days Fluticasone Nasal Spray 2 sprays in each nostril daily x 7 days Rhinorrhea and/or sneezing Diphenhydramine 25 mg PO QHS x 7 days Cromolyn Nasal Solution 1 spray per in each nostril 3-6 times/day x 7 days Ipratropium Nasal Solution 2 sprays in each nostril 3 times per day x 7 days

REFERENCES:
1. Stanfield J, Shuman, Alan L, Bero, Herbert W, Gagg, Michael A, Gerber, Edward L, Cooper, Grace Lee, Joffe, M, Martin, Chris Van Berneken. Clinical Practice Guideline for the Diagnosis and Management of Group A Streptococcal Pharyngitis: 2012 Update by the Infectious Diseases Society of America. Clinical Infectious Diseases, Volume 55, Issue 10, 15 November 2012, Pages e88-e102, <https://doi.org/10.1093/cid/cir567>
2. U.S. Department of Veterans Affairs Veterans Health Administration PBM Academic Detailing Service. Identification and Management of Acute Respiratory Tract Infections (ARI) Without Overusing Antibiotics. Accessed on 10/22/2019.

ACUTE BRONCHITIS

SYNDROME	TREATMENT
Signs & Symptoms: - Cough lasting 3 weeks - Chest radiograph ruled out pneumonia if HR > 100 beats/minute - Respiratory rate > 24 breaths/minute and temperature > 100.4 F	Symptomatic Treatment ONLY Headache, and/or muscle/joint pain Ibuprofen 200-400mg PO Q4-6h x 7 days Naproxen 500mg PO Q12h x 7 days Acetaminophen 650-1000mg PO Q4-6h (max: 4000mg/day) x 7 days Cough Dextromethorphan 30mg PO Q4-6h x 7 days Guaifenesin IR 200-400mg PO Q4h x 7 days Benzonate 100-200mg PO Q8-12h x 7 days Albuterol Inhaler (if wheezing present) 2 inhalations Q4-6h x 7 days Nasal congestion Saline Nasal Spray or Nasal Irrigation x 7 days phenylephrine 10-20mg PO Q4h x 7 days Oxymetazoline Nasal Spray 2-3 sprays in each nostril BID (duration <3 days) x 7 days Fluticasone Nasal Spray 2 sprays in each nostril daily x 7 days Rhinorrhea and/or sneezing Diphenhydramine 25 mg PO QHS x 7 days Cromolyn Nasal Solution 1 spray per in each nostril 3-6 times/day x 7 days Ipratropium Nasal Solution 2 sprays in each nostril 3 times per day x 7 days

REFERENCES:
1. U.S. Department of Veterans Affairs Veterans Health Administration PBM Academic Detailing Service. Identification and Management of Acute Respiratory Tract Infections (ARI) Without Overusing Antibiotics. Accessed on 10/22/2019.

URINARY TRACT INFECTIONS

ASYMPTOMATIC BACTERIURIA
- Patients with indwelling catheters: $\geq 10^6$ colony-forming units (CFU)/mL in a voided urine specimen without signs or symptoms attributable to UTI
- Patients with indwelling urinary catheters: $\geq 10^6$ CFU/mL remains the most appropriate diagnostic criteria for bladder bacteriuria without signs or symptoms attributable to UTI

DO ORDER + TREAT for	DO NOT ORDER + TREAT for
<ul style="list-style-type: none"> Pregnant women Patients undergoing endourological procedures 	<ul style="list-style-type: none"> Healthy non-pregnant women Functionally impaired adults (community or LTCF) Patients with diabetes Solid organ transplant other than kidney Spinal Cord Injury Patients with short-term (< 30 days) urethral catheters Patients undergoing elective non-urological surgery Patients with implanted urologic devices

SYNDROME	TREATMENT	DURATION
Acute uncomplicated cystitis	Nitrofurantoin 100 mg PO BID OR Trimethoprim-sulfamethoxazole 1 DS Tab BID OR Cefpodoxime 200 mg PO BID	MALE 7 days 7 days 7 days FEMALE 5 days 3 days 7 days
Acute uncomplicated pyelonephritis	Ciprofloxacin 500 mg PO Q4-6h OR Trimethoprim-sulfamethoxazole PO BID OR 1 gm Ceftriaxone IM/IV once then Cefpodoxime 400 mg PO BID	7 days 14 days 10-14 days

Complicated UTI: presence of factors that predispose to persistent or relapsing infection, such as foreign bodies (e.g., catheter, indwelling catheters or other drainage devices), obstructions; immunosuppression; renal failure; renal transplantation; and urinary retention from neurologic disease.
Patients with high grade fever, rigors or chills, hemodynamic instability, or other signs of sepsis should be admitted to the hospital for IV antibiotics.

REFERENCES:
1. Lindsay F, Nicolle, Kalpana Gupta, Suzanne F Bradley, Richard Colgan, Gregory P DeMur, Dimitri Drakonis, Linda O Eicken, Suzanne E Gearings, Bella Kovacs, Thomas M Houston, Manisha Jadhav-Mehra, Shandi L Knight, Sastry Srinivas, Anthony J Schaeffer, Barbara Trautner, Spinn Wulf, Reed Szentpaly, 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, Pages e88-e110, <https://doi.org/10.1093/cid/ciy117>
2. Kojouhar Gupta, Thomas M. Hooton, Kurt G. Naber, Spinn Wulf, Richard Colgan, Loren E. Miller, Gregory J. Moran, Lindsay E. Nicolle, Raul Raz, Anthony J. Schaeffer, David E. Soper. 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. Clinical Infectious Diseases, Volume 50, Issue 5, 1 March 2010, Pages e109-e120, <https://doi.org/10.1093/cid/cip027>
3. Jank D, Sobel, Patricia Brown, Urinary Tract Infections, Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, 72, 962-988-44
4. Drakonis DA, Rector TS, Cutting A, Johnson JR. Urinary tract infection in male veterans: treatment patterns and outcomes. JAMA Intern Med. 2013 Jan 14;173(1):62-8. doi: 10.1001/2012.jamainternmed.825. PubMed PMID: 23123775.
5. Cantall JWS, Robinson AV, Kirby A. A systematic review of randomised clinical trials for oral antibiotic treatment of acute pyelonephritis. Eur J Clin Microbiol Infect Dis. 2018 Dec;37(12):2285-2291. doi: 10.1007/s00964-018-3371-y. Epub 2018 Sep 6. PubMed PMID: 30191839.
6. Vagler S, Kuehl E. Pyelonephritis treatment in the community emergency department: cephalosporins vs. first-line agents. Am J Emerg Med. 2018 Nov;36(11):2054-2057. doi: 10.1016/j.ajem.2018.08.016. Epub 2018 Aug 6. PubMed PMID: 30119986.
7. Lin K, Orbanic I, Mang N, Wei W, Prokesh BC. Oral cephalosporins versus Fluoroquinolones for the empiric treatment of acute uncomplicated pyelonephritis. Poster presented at: ID Week, 2019, Oct 2-5, Washington, DC.