

Development and Implementation of an UTI Treatment Protocol in a Skilled Nursing Facility

Jenner Minto, PharmD
PGY1 Pharmacy Resident
University of Montana Skaggs School of Pharmacy
April 20, 2018

Disclosure Statement

- This presenter has no conflict of interest to disclose

Learning Objectives

- Discuss the importance of using facility-specific data to develop an UTI treatment protocol in a Skilled Nursing Facility (SNF).
- Describe the steps involved in creating a facility-specific UTI treatment protocol

Background

- Urinary Tract Infection (UTI) in long-term care¹
 - Second most common cause of infection
 - Accounts for 20-30% of infections reported
 - Most common cause of hospitalization for bacterial infection

Objectives

- Evaluate current prescribing practices, resistance data and susceptibility rates
- Develop facility-specific recommendations to guide treatment of UTI

Methods

- Retrospective review of all patients treated for UTI in 2017 at two local SNFs
- Culture and Sensitivity data reviewed and facility-specific resistance reported
- Prescribing patterns documented and compared to facility-specific resistance data
- Facility-specific treatment recommendations developed

Common Pathogens

Infection	Common Uropathogens
Uncomplicated UTI	<i>E. coli</i> * <i>K. pneumoniae</i> * <i>P. mirabilis</i> * <i>Enterococcus spp.</i> * <i>S. saprophyticus</i>
Complicated UTI	Similar to uncomplicated UTI plus: Antibiotic-resistant <i>E. coli</i> * <i>P. aeruginosa</i> <i>Aerobacter baumannii</i> <i>Staphylococcus spp.</i>
CA-UTI	<i>P. mirabilis</i> * <i>Morganella morganii</i> <i>Providencia stuartii</i> <i>C. urealyticum</i> <i>Candida spp.</i>
Recurrent UTI	Antibiotic-resistant <i>E. coli</i> * <i>P. mirabilis</i> * <i>Enterococcus spp.</i> * <i>K. pneumoniae</i> <i>Enterobacter spp.</i> <i>Staphylococcus spp.</i>

* Common local isolates

Facility A

Resistance Data

	Ampicillin	Cefazolin	Nitrofurantoin	Sulfamethoxazole/Trimethoprim	Levofloxacin	Total Isolates
<i>Aerococcus urinae</i>				1		1
<i>E. coli</i>	2	3	0	8	9	17
<i>Enterobacter colatae</i>						1
<i>Enterococcus</i>					2	2
<i>K. pneumoniae</i>			1			1
<i>P. mirabilis</i>		2		2	1	4
VRE					1	1

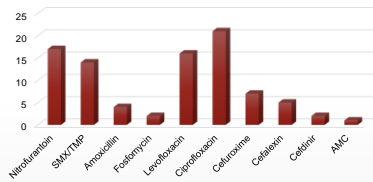
Susceptibility Data

	Ampicillin	Cefazolin	Nitrofurantoin	Sulfamethoxazole/Trimethoprim	Levofloxacin
<i>E. coli</i>	88%	82%	100%	82%	47%

Facility A

Prescribing Trends

Antibiotics Prescribed - 2017



Fluoroquinolones – 39%
First-line agents – 33%

Facility B

Resistance Data

	Ampicillin	Cefazolin	Nitrofurantoin	Sulfamethoxazole/Trimethoprim	Levofloxacin	Total Isolates
<i>Aerococcus urinae</i>					1	2
<i>E. coli</i>			3	4	8	16
<i>Enterococcus</i>			1		1	1
<i>P. aeruginosa</i>					1	2
<i>K. pneumoniae</i>			2			2
<i>P. mirabilis</i>			5	4	1	6

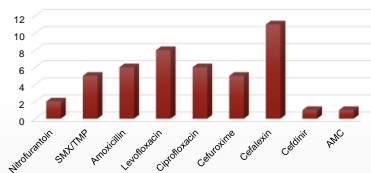
Susceptibility Data

	Ampicillin	Cefazolin	Nitrofurantoin	Sulfamethoxazole/Trimethoprim	Levofloxacin
<i>E. coli</i>	100%	100%	81.25%	75%	50%

Facility B

Prescribing Trends

Antibiotics Prescribed - 2017



Cephalosporins – 38%
Fluoroquinolones – 31%
First-line agents – 15.5%

Observations

- High rates of empiric fluoroquinolone use
 - High rates of resistance
- High rates of *E. coli* resistance to first-line UTI agents
- Recent lab values (\pm 3 months of treatment) absent in most residents
- Dehydration common
 - BUN/SCr > 25 in 78% of patients with available labs (n = 32/41)
- NO antibiotic de-escalation based on culture and sensitivity
 - Antibiotics modified only when organisms resistant to empiric treatment

Limitations

- Limited culture and sensitivity data available in the EMR
 - N= 56

Facility Specific Treatment Recommendations

Empiric Therapy

- **Uncomplicated UTI**
 - Nitrofurantoin x 5 days in absence of previous resistance OR
 - Cephalosporin x 5 days
 - If previous resistance, treat empirically based on previous culture results
- **Complicated UTI**
 - Nitrofurantoin or fluoroquinolone x 7-14 days in absence of previous resistance
 - If previous resistance, treat empirically based on prior culture results

Facility Specific Treatment Recommendations

Definitive Therapy

- Treat based on culture results
 - ALWAYS de-escalate to narrow spectrum antibiotic if possible
- Nitrofurantoin or SMX/TMP if susceptible
- Cephalosporin if Nitrofurantoin and SMX/TMP resistant
- Fluoroquinolone only if resistance to alternatives

Facility Specific Treatment Recommendations

All Patients

- Obtain UA and culture
- Increase fluid intake
- Sensitivity results will guide definitive treatment
- De-escalate therapy!!!
 - Broad spectrum antibiotics should be avoided when possible

Facility Specific Treatment Recommendations

1. Empiric Therapy

- All UTIs treated empirically with nitrofurantoin or cephalosporin
2. ONE prescription for Levofloxacin
- Prescribed by ID
3. De-escalation occurred in all cases with narrow-spectrum alternatives following culture and sensitivity

Question #1

Which of the following is a reason to develop a facility specific UTI treatment protocol in a Skilled Nursing Facility?

- A. Formularies are often limited in Skilled Nursing Facilities
- B. Antimicrobial resistance may differ substantially from documented local resistance patterns
- C. All UTIs in a Skilled Nursing Facility should be treated with the same antibiotic
- D. UTIs in Skilled Nursing Facilities are often caused by atypical pathogens

Question #1

Which of the following is a reason to develop a facility specific UTI treatment protocol in a Skilled Nursing Facility?

- A. Formularies are often limited in Skilled Nursing Facilities
- B. Antimicrobial resistance may differ substantially from documented local resistance patterns**
- C. All UTIs in a Skilled Nursing Facility should be treated with the same antibiotic
- D. UTIs in Skilled Nursing Facilities are often caused by atypical pathogens

Question #2

Which of the following is an important component in developing a facility-specific UTI treatment protocol?

- A. Access to culture and sensitivity data
- B. Assessment of current prescribing patterns
- C. Support from medical staff
- D. All of the above are important

Question #2

Which of the following is an important component in developing a facility-specific UTI treatment protocol?

- A. Access to culture and sensitivity data
- B. Assessment of current prescribing patterns
- C. Support from medical staff
- D. All of the above are important

References

1. Garoto L, Baur, GT. Urinary tract infections in older adults residing in Long-term-care facilities. *Ann Longterm Care* 2012;20(4):33-38.
2. Bates B. Interpretation of Urinalysis and Urine Culture for UTI Treatment. *US Pharm* 2013;38(11):65-68.
3. Coyle EA, Prince RA. Urinary Tract Infections and Prostatitis. In: *DiVito TJ, Talbert RL, Yee CC, Matthei GR, Walls BC, Pinsky LM, editors. Uroinfectiology: A Pathophysiology Approach*. 1st ed. New York (NY): McGraw-Hill; Available at books.lww.com. Accessed January 9, 2017.
4. Perna-Monaco M, Haber AL, Casson M, Hultgren SA. Urinary tract infections: epidemiology, mechanisms of infection and treatment options. *Nat Rev Microbiol*. 2015;13(5):289-294.
5. Finlay-Miller W. Correlative between pharmacokinetic/pharmacodynamic parameters and efficacy for antibiotics in the treatment of urinary tract infection. *Int J Pharmaceut* 2002;219:364-385.
6. Gupta K, Grigoriou L, Trause B. Urinary Tract Infection. *Ann Intern Med*. 2011;157(10):647-654. doi:10.7326/ATC01710000.
7. Gupta K, Hooton TM, Naber KG, et al. Guidelines for Antimicrobial Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2011 Update by the Infectious Disease Society of America and the European Society for Microbiology and Infectious Diseases. *Clin Infect Dis* 2011;53(10):e162.
8. Hooton TM, Bradley FF, Cardenas DD, et al. Diagnosis, Prevention and Treatment of Catheter-Associated Urinary Tract Infection in Adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. *Clin Infect Dis* 2011;52(12):e162.
9. Lee SS, Li J. Urinary Tract Infections. In: *Murphy F, Lee MW, eds. Pharmacotherapy Self-Assessment Program, 2018 Book 1: Infectious Diseases*. Lippincott Williams & Wilkins; American College of Clinical Pharmacy; 2017:1-11.
10. [LipD Drugs, Lippincott \[Internet\]](http://www.ahrq.gov). Hudson, OH: Wolters Kluwer Health, Inc. 1978-2013. Accessed February 7, 2018. Available at: <http://www.ahrq.gov>.
11. Nicoli, LE, Snyder S, Cripps R, et al. Infectious Diseases Society of America Guidelines for the Diagnosis and Treatment of Asymptomatic Bacteriuria in Adults. *Clin Infect Dis* 2014;58(1):e44-49.
12. Parviz, S. Methenamine Hippurate in the treatment of chronic urinary tract infections: a trial in a geriatric hospital. *J Int Med Res* 1976;4(2):111-114.
13. Smith A. [LipD Drugs 2017 Urinary Tract Infections, Complicated \[Updated 2012 Jan 27\]; in StatPearls \[Internet\]. Treasure Island \(FL\): StatPearls Publishing; 2017. Jun 2018. Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3426219/>. Accessed January 9, 2017.](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3426219/)
14. Sobel JD, Stone D, Chapter 78: Urinary Tract Infection. In: Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, 8th ed. Philadelphia, PA: Elsevier; 2015:856-871.
15. [Urinary Tract Infections \(UTI\) Fact sheet for long-term care facilities \(n.d.\). CDC website. Available at: <http://www.cdc.gov/ncidod/dlhd/urinary-tract-infections/uti-fact-sheet-for-long-term-care.pdf>. Accessed January 9, 2017.](http://www.cdc.gov/ncidod/dlhd/urinary-tract-infections/uti-fact-sheet-for-long-term-care.pdf)