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Evaluation of McGeer Criteria for UTI Determination in a Nursing Home

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Abstract

Problem: Urinary tract infection (UTI) is one of the most complex and challenging medical diagnoses to make in the long-term care (LTC) population. The unnecessary treatment of a UTI can increase cost of care and the likelihood of multi-drug resistant organisms.

Methods: The McGeer criteria which focuses on UTI in the LTC population was utilized to complete a quality improvement initiative. A descriptive cohort project utilizing retrospective and prospective data was completed to determine if an implemented McGeer criteria protocol improved the avoidable treatment of asymptomatic bacteriuria (ASB).

Results: Before implementation of the protocol, 62.5% of residents were unnecessarily treated for UTI in the presence of asymptomatic bacteriuria. Upon institution of the McGeer criteria protocol, the number of residents inappropriately treated with antibiotics dropped to 6.25%. The results determined that use of a specific protocol increased accuracy of UTI diagnosis.

Implications: Antibiotics were prescribed 100% of the time before and after implementation of the McGeer criteria. This indicates that while behaviors changed for nurses in relation to charting, healthcare providers did not change prescribing practices to align with the criteria. These providers need targeted education about the McGeer criteria and appropriate prescribing practices related to treatment of UTI.

Evaluation of McGeer Criteria for UTI determination in a Nursing Home

Introduction

Urinary tract infection (UTI) is one of the most diagnosed and treated infections in both hospitalized and long-term care (LTC) residents (Rowe & Juthani-Mehta, 2014). The elderly population, with a suspected or diagnosed UTI, account for more than eight million office visits and one million emergency department visits with annual costs exceeding 2.3 billion dollars (Kistler, et al., 2017). Few clinical infections pose more decision-making management than UTI due to the lack of a diagnostic gold standard in LTC facilities (Kistler, et al., 2017). In older adults it is not uncommon to have asymptomatic bacteriuria (ASB). The rates of ASB increase with age and are higher in long-term care residents. Diagnosing a symptomatic UTI versus ASB is particularly important as antibiotics are only essential for symptomatic UTIs. UTIs account for up to 20% of healthcare-associated infections (CDC, 2019). Currently, there is disagreement within the medical community as to what constitutes a UTI (Kistler, et al., 2017).

Older adults residing in the long-term care facility have increased risk factors for the development of UTIs. Their significant functional and cognitive impairment along with multiple co-morbidities and debilitating conditions; neurogenic bladder, incontinence, Alzheimer's, dementia, Parkinsons, cerebral infarct, diabetes, quadriplegia, and multiple sclerosis have been shown to increase ASB (Rowe & Juthani-Mehta, 2014,). Currently, between 25 and 75 percent of antibiotics used in the LTC facilities do not meet clinical guidelines for treatment. The overuse of antibiotics is causing multidrug-resistant organisms (MDRO) and is costly to the health care system (AHRQ, 2017). The diagnosis and treatment of a UTI is the most common reason for antimicrobial use in the LTC

population. Due to the overtreatment of UTI, 32% of Escherichia Coli, the number one

organism that causes UTIs in elderly residents, has become resistant to

Sulfamethoxazole/Trimethoprim, and 17% has become resistant to fluoroquinolones

which decreases the choice of antibiotics sensitive to the organism (Rowe & Juthani-

Mehta, 2014).

Long-term care residents have a higher prevalence of bacteriuria making it

difficult for staff and providers to distinguish urinary tract infection versus asymptomatic

bacteriuria. The McGeer criteria was introduced into the long-term care population in

1991 with a definition of symptomatic treatment of UTI (Rowe, & Juthani-Mehta, 2014).

The McGeer criteria defined in Appendix A by Rowe and Juthani-Mehta (2014) was

adopted by several regulating agencies however never were validated. The criteria,

updated in 2012 by an expert consensus panel, reflects the changes and acuity of current

residents (Stone, & et al., 2012). The McGeer criteria remains underused for residents in

the LTC facilities by both nursing staff and medical providers (Rowe & Juthani-Mehta,

2014).

In the LTC facility where the project took place, there is currently no standardized

protocol being used for diagnosing and treating a UTI by the providers. There are over 40

different providers who treat and manage the LTC residents without standard guidelines.

Providers choose to treat a UTI for many reasons: recent falls, increased confusion,

family request, UTI signs and/or symptoms, and/or change in a resident's condition. Any

time a resident has a fall, per the current facility protocol, a urine dipstick is completed by

nursing even if there are no other signs/symptoms of a UTI. The provider is notified only

of results testing positive for leukocytes and/or nitrates. The provider may choose to send

the urine for a culture and sensitivity (C&S). Many residents in LTC have ASB and as many as half of all positive urine cultures should be considered false positives. Other signs/symptoms should be evaluated and documented for proper UTI diagnosis (Kistler, et al., 2017). Nursing staff in LTC facility have not been educated on the different criteria available for UTI treatment that encompasses antibiotic stewardship as there is no current policy or procedure in place at the facility.

The purpose of this project was to evaluate how often antibiotics are inappropriately prescribed for UTIs in the LTC population. The aim was to improve accuracy of UTI diagnosis and treatment and reduce inappropriate use of antibiotics for ASB by implementing a quality improvement project using a descriptive cohort design with both retrospective and prospective record reviews. The outcome measure was to see if the implemented protocol verifies residents treated for UTI met the McGeer criteria and were not treated for ASB. Study question: How does the implementation of an evidenced-based protocol impact the accurate diagnosis of a UTI and improve antibiotic prescribing practices by only treating residents with UTI not ASB?

<div align="center">Review of Literature</div>

A literature search included a systematic review from 2012-2020 using the CINAHL database using keywords, urinary tract infection, skilled nursing facility, long term care facility, nursing home patients, McGeer criteria, Loeb criteria, antibiotic stewardship, nurses role in SNF care, criteria for urinary tract infection, unnecessary antibiotics use, surveillance definition for UTI, CMS guidelines, and overtreatment of UTI. The inclusion criteria: all residents residing in the long-term care facility, without regards to age limit, patients with symptomatic UTI, treatment for UTI and asymptomatic

bacteriuria. The exclusion criteria: indwelling or suprapubic catheters, hospice residents, recently hospitalized patients, and primary care office patients. An internet search was performed using McGeer criteria, Loeb criteria, urinary tract infection, LTC residents, and unnecessary use of antibiotics, antibiotic stewardship, and situation, background, assessment, recommendations (SBAR) and included a website search for organizations: CDC and AHRQ.

There are currently multiple criteria available for providers to use when diagnosing and treating a UTI for the LTC resident. Many providers in the LTC deviate from current guidelines when treating a UTI and consider non-specific symptoms as a reason to begin treatment due to family or resident request or incomplete resident data (Kistler, et al., 2017). The CDC and Infectious Diseases Society of America criteria rely on urine culture results (Caterino, et al., 2017). A study completed by Kistler, et al., showed that in a six-month period almost half of all prescribed antibiotics for suspected UTI had no documented symptoms from nursing and the treatment rested solely on the C&S results (2017).

The CDC and Loeb criteria are intended to specify the diagnosis. The CDC criteria is used to establish a conservative estimate for surveillance purposes whereas the Loeb criteria primary goal is to decrease the antibiotic use in the LTC population when unnecessary (Caterino, et al., 2017). The Loeb criteria indicates that a resident likely has an infection, when the criteria has been met, and antibiotics should be initiated (Minnesota Department of Health, 2019). In a study completed by Caterino, et al., the Loeb criteria was used and failed to identify three-fourths of UTIs, as the Loeb criteria heavily weighs in on having the C&S results (2017).   The Loeb and McGeer criteria are

most recognized for the LTC facility and population treatment of UTI (Rowe & Juthani-Mehta, 2014). The Loeb and McGeer criteria both allow for a retrospective review of the residents' signs/symptoms of a suspected UTI, however the McGeer criteria addresses the use of diagnostic criteria that was not readily available at antibiotic initiation (Minnesota Department of Health, 2019).

In the elderly population, most residents present with an atypical clinical presentation of infection. In a study completed at Monash Health, which had been utilizing the McGeer infection criteria for UTIs over a three-year time frame concluded 128 patients were prescribed antibiotic therapy for a UTI, however only 5.9% of the presumed UTIs met the McGeer criteria (Ryan, Gillespie, & Stuart, 2018). The Centers for Disease Control currently estimates the prevalence of asymptomatic bacteriuria to account for 20-50% in long-term care facilities and treating residents with antibiotics does not have any clinical benefit, increases cost and prevalence of multi-drug resistant organisms. The implementation of and education about the McGeer criteria along with antimicrobial stewardship will improve the overtreatment of UTIs (Ryan, Gillespie, & Stuart, 2018).

It was estimated during 2013 there were between 1.13 and 2.68 million infections in the long-term care facilities with UTI being the most common infection. Due to the prevalence of asymptomatic bacteriuria, urinary tract infections are consistently overtreated (Herzig, Dick, Sobero, Pogorzelska-Maziarz, Cohen, Larson, & Stone, 2017). The prevalence of ASB increases with age in both men and women suggesting colonization of bacteria not requiring treatment. Rodhe, et al (2014) as cited in Rowe and Junthani-Mehta, completed a cohort study showing 25% of their sample group was

treated for ASB increasing cost and resistance of medications to organisms. A study completed by Ryan, Gillespie, and Stuart (2018) found 85% of their sample size did not meet evidence required to diagnosis a UTI using the criteria

The McGeer criteria focuses on active infection confirmation prior to treatment versus the treatment of asymptomatic bacteriuria which continues to be a challenge for providers (Rowe & Juthani-Mehta, 2014). When using the McGeer criteria to treat residents for a UTI, the goals are to decrease the possible adverse reactions of medications, lower healthcare costs, and helps limit antibiotic resistance (Mayne, Bowden, Sundvall, & Gunnarsson, 2019). The McGeer criteria take into account the risk of persistent bacteria in older adults due to multiple co-morbidities and focus on treating active infection to prevent complication of over-treatment with antibiotics for residents (Rowe & Juthani-Mehta, 2014). The McGeer criteria has classification for residents in the long-term care facilities with an indwelling or suprapubic catheter but those criteria will not be included due to low incidence of patients with indwelling catheters (Rowe & Junthai-Mehta, 2014). The 2012 updated McGeer criteria is the national standard for LTC facilities for infection surveillance (Stone, et al., 2012).

The McGeer criteria has limitations for those who have cognition or communication problems. It was noted by Ryan, Gillespie, and Stuart (2018) and Rowe and Juthani-Mehta (2014) that there is a flaw in the McGeer criteria for residents with mental disorders. The diagnosis of a UTI requires the presence of localized genitourinary symptoms which can be a difficult diagnosis in residents who have a history of advanced dementia and are unable provide an adequate medical history. In a study completed with residents diagnosed with advanced dementia; the most common reason residents were

treated for UTI in the LTCs was due to a change in mental status. Rowe and Juthani-Mehta concluded 75% of the residents who were treated for a urinary tract infection did not qualify according to the criteria, showing 25% of the residents presented with asymptomatic bacteriuria (2014).

The current gaps in literature revolve around no recent McGeer criteria studies. The last study noted completed in a nursing home was in 2016 and UTIs continue to be a significant problem to the overuse of antimicrobial therapy for ASB. Current evidence continues to be insufficient to determine if confusion in the elderly is an indicator of an active UTI (Mayne, Bowden, Sundvall, & Gunnarsson, 2019).

The role of nurses and providers in antibiotic stewardship needs to be addressed when confirming the diagnosis of a UTI. The nurse is the first person to assess the resident in a LTC facility and report their findings to the provider indicating a possible need for antibiotics (Ryan, Gillespie, & Stuart, 2018). The lack of documentation in the LTC facility from the nursing staff increases the likelihood of inappropriate antibiotic prescriptions (Kistler, et al., 2017). Providers often make decisions regarding residents' care without a detailed history, family input, limited information from nursing staff, and the inability to examine the resident at the time of their illness which causes them to often deviate from current guidelines when prescribing antibiotics (Kistler, et al., 2017).

Framework PDSA Cycle

The objective of the cycle was to develop a protocol based on the McGeer criteria to improve the unnecessary treatment of ASB in the long-term care facility. A small sample of residents was obtained using the completed SBAR from nursing, infection control log sheet, EHR report, and health care provider notes. The resident's

signs/symptoms were compared to the McGeer Criteria (Appendix A). The data from the sample was analyzed using Appendix B to see if further changes in the current model and collection tools were needed. Nurses implemented the protocol.

Method

This quality improvement initiative was a descriptive cohort project utilizing retrospective and prospective record review before and after an evidence based UTI treatment protocol was implemented. A single LTC facility within one corporation's fourteen LTCs was selected for this study. The LTC is located in a Midwest suburban area that houses up to 321 residents. The facility currently has mixed payer sources: skilled, Medicaid, and private pay residents. The sample population was a convenience sample of residents diagnosed with a UTI without indwelling or suprapubic catheters. A three-month retrospective data collection from was completed followed by a three-month prospective data collection after the implementation of a UTI treatment protocol in the LTC facility. Skilled residents were excluded from the sample size as they are short term stay residents. Hospice residents were excluded from the sample size as laboratory testing is not usually completed. There was no age exclusion.

Approval was sought from the assigned capstone committee. The LTC facility did not have a relationship with an IRB or ethics committee. Approval was obtained from the vice president, the administrator, and medical director of the long-term care facility. Approval was granted from the University of Missouri St. Louis IRB committee. No approval from human studies was needed as this was a retrospective/prospective record review with no direct patient contact, therefore exempt status was granted. The purpose

of this study was to implement a protocol to improve the accuracy of UTI diagnosis and treatment and reduce inappropriate use of antibiotics for ASB.

The resident information was obtained from the infection control log, completed SBARs, facility event and observation reports, nurses' progress notes, providers' notes and from a report run by using the facility's electronic health record: Matrix. Data was kept on a password protected encrypted file on a computer and only the patients age, gender, organism of UTI, and McGeer criteria met was recorded. Each resident chart (Appendix B) was coded with a number beginning with R01 for the retrospective data and P01 for the prospective data. The data was entered into Excel with the corresponding number. The charts of the residents that were diagnosed and treated for a urinary tract infection were reviewed to see if the McGeer criteria was met. Data was analyzed retrospectively and prospectively pre and post implementation of an evidenced based protocol. A descriptive statistical analysis method was used to compare the groups of residents who met McGeer criteria and those who did not.

The descriptive cohort study was completed by obtaining committee consent, facility consent, and IRB approval from the University of Missouri Saint Louis. A three-month retrospective data collection was completed using Appendix B. The data from Appendix B was compared to Appendix A to see if the McGeer criteria was met. Residents' charts were coded with a number beginning with R01 (Appendix B). The data was entered on a password protected computer using Excel only recording the age, gender, McGeer criteria met, and organism of the UTI. The nursing staff was educated on the McGeer criteria protocol (Appendix A) by completing training sessions: one on one, group, divisional, and telephone conferences. The nursing staff at the LTC facility

implemented the protocol. After initiation of the protocol, a three-month prospective data collection was completed using Appendix B. The data from Appendix B was compared to Appendix A to see if the McGeer criteria was met. Residents' charts were coded with a number beginning with P01 for Appendix B. The data was entered on a password protected computer using Excel only recording the age, gender, McGeer criteria met, and organism of UTI. The retrospective and prospective data was collected and evaluated to see whether the McGeer criteria was met. The UTI organism was recorded to evaluate the most common organism infection of UTI in the LTC. The data was analyzed using both a Fischer exact test and descriptive statistics. The data collection events (retrospective and prospective) were evaluated for improvement of treating residents' who met the McGeer criteria versus treating ASB post implementation of a protocol.

The McGeer criteria protocol was designed for ease and quick reference for the nursing staff. The protocol was implemented using one on one education, group discussions and telephone education. The educational sessions with the nursing staff lasted 15-30 minutes per session. A copy of the protocol (Appendix A) was placed at every nurses' station in the building for reference and was shared with nursing management and the medical director.

<div align="center">Data Collection and Results</div>

The retrospective data for the three-month period concluded with N=16. The resident charts were selected using a convenience sample and ranged from 57-95 with a mean of 82.50 years of age (Intellectual Statistics, 2019). The sample included 14 (87.50%) females and two males (12.50%). Of the 16 residents, 10 (62.50%) did not meet the McGeer criteria whereas six (37.50%) did meet the McGeer criteria. Of the 16

participants, 15 had some type of organism growth in their urine culture and one culture

had no growth (Intellectual Statistics, 2019).

      After the implementation of the protocol, the prospective data for a three-month

period concluded with N=16. The resident charts were selected using a convenience

sample and ranged from 65-100 with a mean of 81.81years of age (Intellectual Statistics,

2019). The sample included 15 (93.75%) females, and one male (6.25%). Of the 16

residents, one (6.25%) did not meet the McGeer criteria whereas 15 (93.75%) did meet

the McGeer criteria. Of the 16 participants, all had some type of organism growth in their

urine culture (Intellectual Statistics, 2019).

      The data violated the Chi Square requirement. The data was analyzed using the

Fisher exact test which proved the results were significant based on a p value of 0.002

which is less than an alpha value of 0.05. The odds ratio calculated at 20.04 indicating

not meeting the McGeer criteria is 20.04 times more likely in the retrospective study

compared to the prospective study.

      The most prominent organism for both data sets was Escherichia Coli, eighteen

(56.25%). The antibiotic most often prescribed was Bactrim DS, 12 (37.5%) (Intellectual

Statistics, 2019). Antibiotics were prescribed 100% of the time before and

after implementation of the McGeer criteria. This indicates that while behaviors changed

for nurses in relation to charting, healthcare providers did not change prescribing

practices to align with the criteria. These providers need targeted education about the

McGeer criteria and appropriate prescribing practices related to treatment of UTI.

<div align="center">Discussion</div>

      This quality improvement initiative was a descriptive cohort project utilizing

retrospective and prospective data. For the retrospective data, a total of 10 participants did not meet the McGeer criteria whereas after the implementation of the McGeer protocol, only one participant did not meet the criteria. To treat an acute UTI, the costs vary widely from ten dollars to treat with Bactrim DS up to $3970 for IV Ertapenem (Gaitonde, Malik, & Zimmern, 2019). Depending on the payer source in the long-term care facility, the cost of the antibiotic treatment as well as indirect costs may fall on the facility or the family and continue to increase the cost of healthcare (Gaitonde, Malik, & Zimmern, 2019).

The implementation of the project educated nursing staff to be more cognizant of their nurses notes and charting. During the retrospective study, many of the nurses' notes did not have much information regarding the resident's condition. It was normal to document the resident has increased confusion; UA obtained, noting no other signs/symptoms of a UTI. After implementation of the protocol, nursing staff were assessing sign/symptoms of their residents and focusing on the presenting illness versus calling the doctor with limited information causing the provider to rule out all infections.

The seasoned nurses were very interested in making a positive change to enhance the care of the residents asking lots of questions and wanting to understand the implication for practice and how they could improve on their charting and assessment skills. The seasoned nurses also shared their knowledge with the certified nursing assistants (CNA), as they provide the most direct care to the residents. The newer nurses to the facility did not have a lot of experience treating and caring for residents in the LTC facility causing some disconnect on what was expected from them.

The seasoned nursing staff improved documentation in their nurse's notes by addressing vital signs, focusing on temperature and concentrating on the culture and sensitivity growth count versus just addressing the organisms. SBARs were completed by the seasoned nurses and new onset dysuria, urgency and incontinence was documented for the provider to review. When the provider assessed the resident, their notes discussed the change in condition with sign/symptoms of a UTI noted by the nurses. One of the most apparent reasons for inappropriate prescribing of antibiotics in the nursing home is lack of documentation by the staff (Kistler, et al., 2017). Even with the improved nursing documentation, there was still treatment of ASB indicating the providers need education for ASB, antibiotic stewardship and prescribing practices for the McGeer criteria.

Adverse reactions for antibiotics can be costly and even deadly. When prescribing antibiotics, providers should take into account the benefits of treatment while determining the right type of antibiotic and dosage related to a resident's medical history. Antibiotics contribute to one out of every five medication-related visits to the emergency department and many of these antibiotics are started for residents who present with asymptomatic bacteriuria. (CDC, 2020).   When prescribing unnecessary antibiotics to the residents, they are at risk of developing common side effects: rash, dizziness, nausea, diarrhea and increased antibiotic resistance (CDC, 2020).

Multi-drug resistant organisms add further complications to a urinary tract infection which result in ineffective treatments. In the long-term care facility, due to the unnecessary treatment of ASB, UTIs have a higher prevalence of resistances to antibiotics (Ikram, Psutka, Carter, & Priest, 2015). Mortality rates increase with the long-

term care population due to resistant strains of antimicrobials from over prescribing antibiotics (Ikram, Psutka, Carter, & Priest, 2015). With improvement of prescribing practices for UTI's and treating only residents meeting the McGeer criteria, treatment is provided when necessary, therefore decreasing the risk of ASB and limiting exposure of resistant organisms from resident to resident (Backus, 2015).

Limitations to this study included a small sample size where n=16 for both the retrospective and prospective data collection. The pandemic of COVID-19 was a limitation to the study due to staff spending multiple meetings learning the evolution of the disease and CDC guidelines which limited time for additional nursing education.

Conclusion

The McGeer criteria protocol should be implemented into practice to reduce the overtreatment of ASB. To implement into practice, education and training should be provided to nursing staff so that documentation and following protocol-can be improved. Time needs to be invested in teaching CNAs about UTI signs/symptoms. The medical director at the facility needs to implement the McGeer protocol into the standard of care at the nursing home to improve prescribing practices for all providers.

The McGeer criteria was implemented to accurately diagnose and treat a UTI while improving care in the long-term care population. The study concluded that by initiating a protocol, nursing documentation can improve therefore refining the accuracy of a UTI diagnosis. The precise diagnosis and treatment of a UTI decreases health care costs, lessens the likelihood of multi-drug resistant organisms, and decreases the unnecessary risk of an adverse reaction to an antibiotic thus improving resident outcomes.

References

Backus, D. (2015, September). Antimicrobial therapy in long-term care: controversy,

colonization and criteria. *The Consultant Pharmacist*, *30*(9).

Be antibiotics aware: smart use, best care (2020, March 10). In *Centers for Disease

Control and Prevention.* Retrieved from

https://www.cdc.gov/patientsafety/features/be-antibiotics-aware.html

Caterino, J., Leininger, R., Kline, D., Southerland, L., Khaliqdina, S., Baugh, C., …

Stevenson, K. (2017). Accuracy of current diagnostic criteria for acute bacterial

infection in older adults in the emergency department. *The American Geriatrics

Society*, *65*, 1802-1809.

Gaitonde, S., Malik, R., & Zimmern, P. (2019, February). Financial burden of recurrent

urinary tract infections in women: a time-driven activity-based cost

analysis. *Urology*. doi: 10.1016/j.urology.2019.01.033

Healthcare-associated infection surveillance protocol for urinary tract infection events for

long-term care facilities (2019, January). In *Centers for Disease Control and

Prevention.* Retrieved from

 https://www.cdc.gov/nhsn/PDFs/LTC/LTCF-UTI-protocol-current.pdf

Herzig, C., Dick, A., Sobero, M., Pogozelska-Maziarz, M., Cohen, C., Larson, E., &

Stone, P. (2017, July). Infection trends in united states nursing homes, 2006-

2013. *Journal of American Medical Directors*, *18*(7).

doi: 10.1016/j.jamda.2017.04.003

Ikram, R., Psutka, R., Carter, A., & Priest, P. (2015). An outbreak of multi-drug resistant

Escherichia coli urinary tract infection in the elderly population: a case control

Study of risk factors. *Infection Diseases*, 15(244).

doi:10.1186/s12879-015-0974-0

Intellectus Statistics. (2019). Intellectus Statistics [Online Computer Software].

Retrieved from http://analyse.intellectusstatistics.com

Loeb and McGeer Criteria (2019, June 5). In *Minnesota Department of Health*.

Retrieved from https://www.health.state.mn.us/diseases/antibioticresistance

/hcp/asp/ltc/loebmcgeer.pdf

Kistler, C., Zimmerman, S., Scales, K., Ward, K., Weber, D., Reed, D., ... Sloane, P.

(2017). The antibiotic prescribing pathway for presumed urinary tract infections

in nursing home residents. The American Geriatrics Society, 65, 1719-1725

Mayne, S., Bowden, A., Sundvall, P., & Gunnarsson, R. (2019). The scientific evidence

for a potential link between confusion and urinary tract infection in the elderly is

still confusing-a systematic literature review. *BMC Geriatrics*, *19*(32).

doi:10.1186/s12877-019-1049-7

Ryan, S., Gillespie, E., & Stuart, R. (2018). Urinary tract infection surveillance in

residential aged care. *American Journal of Infection Control*, *46*, 67-72.

doi: 10.1016/j.ajic.2017.07.002

Rowe, T., & Juthani-Mehta, M. (2014, March). Diagnosis and management of urinary

tract infection in older adults. *Infectious Disease Clinics of North America*, *28*(1),

75-89. doi: 10.1016/j.idc.2013.10.004

Stone, N., Ashraf, M., Calder, J., Crnich, C., Crossley, K., Drinka, P., ... Simor, A. (2012,

October). Surveillance definitions of infections in long-term care facilities:

revisiting the mcgeer criteria. *Infection Control and Hospital*

Epidemiology, *33*(10), 965-977. doi: xdoi:10.1086/667743

Toolkit 3. Minimum Criteria for Common Infections Toolkit (2017, September).

In *Agency for Healthcare Research and Quality, Rockville, MD*. Retrieved from

https://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit3-

minimum-criteria.htm

Appendices

Appendix A

McGeer LTC Protocol/Education

- Urinary tract infections:
    - Infection in any part of the urinary system, kidneys, bladder, or urethra
    - 8 Million office visits annually
    - 1 Million ED visits annually
    - E Coli Number 1 organism of UTI, 32% is resistant to Bactrim, 17% resistant to Fluoroquinolones
- ASB: Asymptomatic Bacteriuria
    - Very common in older adults/increases with age
    - Does not need treatment with antibiotics
        - Overtreatment costly to healthcare
        - Increase risk of multi-drug resistant organism
        - Increased side of effects of medication for residents
    - Co-Morbidities and debilitating conditions increase risk
        - Neurogenic Bladder
        - Incontinence
        - Alzheimer's/Dementia
        - Parkinsons
        - Cerebral Infarct
        - Quadriplegia
        - Multiple Sclerosis
    - McGeer Criteria
        - Focuses on active infection confirmation prior to treatment
        - Limitation with cognitive impairment
        - Nurses' charting helps to show signs/symptoms of infection
    - Charting
        - Vitals signs with any change in condition
        - Chart signs/symptoms of UTI in nurses' notes
        - Inform provider of findings
        - Inform provider of why labs were ordered
        - Tell Certified nursing assistants to watch for nonverbal cues
            - Grimacing while using bathroom
            - Increased frequency/Briefs needing changed more often
            - Change in urine color/Hematuria
            - Assess resident with McGeer criteria guidelines

McGeer Criteria UTI-without indwelling catheter
Both criteria 1 and 2 MUST be met:
1) At least one of the following:
a) Dysuria OR acute pain, swelling, tenderness of testes, epididymis, or prostate
b) Fever OR leukocytosis and at least ONE of the following: • Costovertebral angle tenderness • Suprapubic pain • Gross Hematuria • New or increased incontinence • New or increased urgency • New or increased frequency
c) If no fever or leukocytosis, then TWO or more of the following: • Suprapubic pain • Gross hematuria • New or increased incontinence • New or increased urgency • New or increased frequency
2) One of the Following:
a) $\geq 10^5$ CFU/mL of $\leq$ organisms in voided urine
b) $\geq 10^2$ CFU of any number of organism of in/out catheter sample

Adapted from: Rowe, T., & Juthani-Mehta, M. (2014, March). Diagnosis and management of urinary tract infection in older adults. *Infectious Disease Clinics of North America*, *28*(1), 75-89.
doi: 10.1016/j.idc.2013.10.004

Appendix B

Antibiotic Tracking Sheet

Chart # _____

Date of UTI Diagnosis	
Gender	
Age	
McGeer Criteria met (Y/N)	
Name or organism	
Culture positive/negative	
Antibiotic Ordered	
Nurses Notes/progress- signs/symptoms	
SBAR completed with signs/symptoms	
Provider note completed	
Facility event and observation reports	
Infection control log	
Miscellaneous Notes:	