

# Urinary Tract Infections

## Introduction

Urinary tract infections are the most common reason for the use of antibiotics in long-term care facilities. The rate of clinical urinary tract infection requiring treatment is estimated to be between 0.1 and 2.4 per 1000 resident days.<sup>1</sup> Urinary tract infections are a significant cause of morbidity in this population, and often lead to complications such as bacteremia and the need for hospitalization.

Unfortunately, the appropriate diagnosis and treatment of urinary tract infections is often problematic in long-term care settings. The high prevalence of asymptomatic bacteriuria in this population (a condition that does not require treatment), and the difficulty in accurately ascertaining symptoms from residents with impaired communication are two complicating factors.

## Risk Factors for Urinary Tract Infection

Long term care residents are prone to development of urinary tract infection because of the presence of co-morbid conditions. The major risk factor for urinary tract infection is the presence of an indwelling catheter, which increases the odds of bacteremia from a urinary source by 39 times.<sup>2</sup> Persons with long-term indwelling catheters have almost a 100% incidence of bacteriuria.

Other risk factors for urinary tract infection include:

- Neurogenic bladder caused by conditions such as stroke, Alzheimer's disease, or Parkinson's disease
- Benign prostatic hypertrophy or prostatitis in men
- Atrophic vaginitis or estrogen deficiency in women
- Diabetes mellitus
- Dehydration
- Functional impairment

## Asymptomatic Bacteriuria

Asymptomatic bacteriuria is defined as the presence of bacteria in a person's urine in the absence of any clinical symptoms of urinary tract infection. The prevalence of asymptomatic bacteriuria is high in long-term care populations. Females in long-term care have 25-50% prevalence of asymptomatic bacteriuria, while males have 15-30% prevalence.<sup>3</sup> This prevalence is on the order of 100x higher than that of symptomatic urinary tract infection requiring treatment. Therefore, most persons with positive urine cultures are asymptomatic.

## Pyuria in Asymptomatic Bacteriuria

Pyuria is the presence of white blood cells in a person's urine. It is usually indicative of a host response to a stimulus, such as bacteria in the urine. Pyuria is common (>90% prevalence) even in asymptomatic bacteriuria, and therefore does not help distinguish asymptomatic bacteriuria from "true" urinary tract infection requiring treatment.<sup>3</sup> However, the absence of pyuria in an immunocompetent host does make "true infection" unlikely.

## Asymptomatic Bacteriuria: Treatment

While screening for and treating asymptomatic bacteriuria is beneficial in certain settings (pregnant women, prior to invasive urologic procedures), there is no benefit to treatment of this condition in residents of long-term care facilities. Several randomized trials have been conducted and have shown no effect on morbidity or mortality, symptoms of chronic incontinence, or episodes of acute urinary tract infection.<sup>4,5,6</sup> In addition, negative consequences have been reported including adverse drug effects, increased isolation of resistant organisms, and increased cost of care. Therefore, current guidelines by the Infectious Diseases Society of America<sup>7</sup> do not recommend screening for or treating asymptomatic bacteriuria in residents of long-term care facilities.

## Diagnosis of Urinary Tract Infection

The key factor in diagnosis of urinary tract infection requiring treatment is the presence of symptoms and objective findings localized to the urinary system. Urinalysis and culture can provide supportive evidence, but is meaningless without associated clinical information. The Society for Healthcare Epidemiology in America (SHEA) has published criteria to help guide the initiation of antibiotics in residents of long-term care facilities (Table 1).<sup>8</sup>

In patients who are noted to have fever and no localizing urinary symptoms, a positive urine culture may not be helpful. Most residents (90%) with fever without urinary symptoms in the absence of an indwelling catheter will ultimately have another explanation for the fever. Because of the high prevalence of asymptomatic bacteriuria in this population, the positive predictive value for a positive urine culture in such a patient is around 12%.<sup>9</sup>

Often, long-term care residents are noted by caregivers to have a change in the appearance or odor of their urine, without any other associated symptoms. Such changes can be caused by a number of factors, including bacteriuria, dehydration, and changes in diet. Even if bacteriuria is the

Minnesota  
Antibiotic  
Resistance  
Collaborative



[www.minnesotaarc.org](http://www.minnesotaarc.org)

Members of MARC include Blue Cross and Blue Shield of Minnesota, HealthPartners, Medica, Minnesota Council of Health Plans, Minnesota Department of Health, Minnesota Medical Association, Minnesota Pharmacists Association, StratisHealth, and UCare Minnesota.



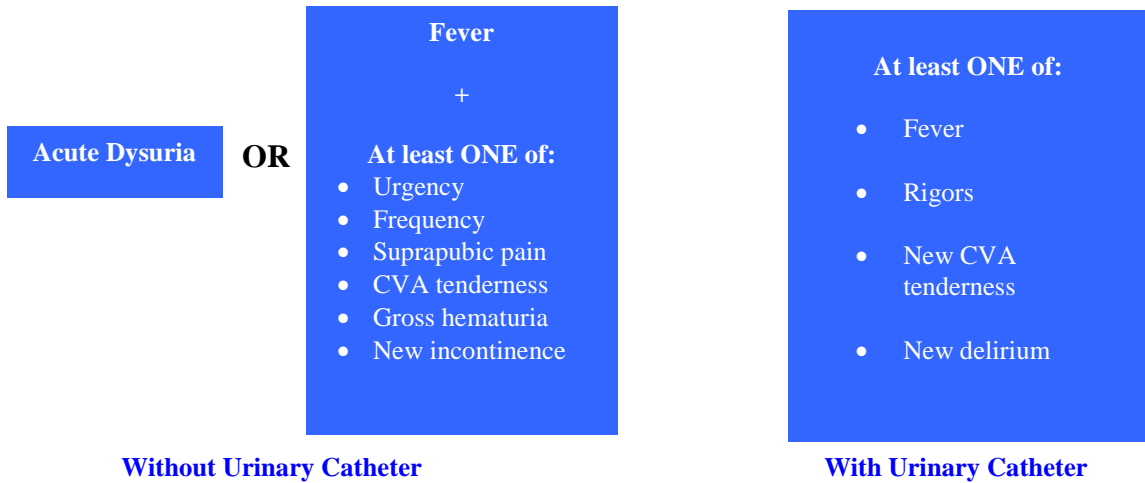


FIGURE 1: SOCIETY FOR HEALTHCARE EPIDEMIOLOGY IN AMERICA MINIMUM CRITERIA FOR THE INITIATION OF ANTIBIOTICS IN PATIENTS WITH AND WITHOUT INDWELLING URINARY CATHETERS

cause of such changes, no treatment is necessary as long as the patient is otherwise asymptomatic.

Because of co-morbid conditions or impaired communication, it can be difficult to determine whether or not a patient is symptomatic. Non-specific symptoms such as fatigue, weakness, sleep disturbance, or poor appetite generally do not correlate with the presence of an acute urinary tract infection requiring treatment. In this situation, observation and monitoring for localizing urinary symptoms (discomfort with urination, flank or suprapubic pain) should be considered.

### Treatment of Urinary Tract Infection

Should patients have symptoms and findings consistent with a symptomatic urinary tract infection along with urine analysis consistent with infection, antibiotics should be started. A urine culture should be obtained prior to antibiotic therapy, given the high rates of resistance in chronic care facilities. Antibiotic selection should be individualized and based on factors including local susceptibility data, prior culture data and antibiotic use history in the patient, consideration of drug interactions or side effects, and the presence of any drug allergies.

Once antibiotic sensitivities are available, therapy should be narrowed when possible. In general, infections should be treated for 7 to 14 days. Post-therapy urine cultures are not recommended unless the patient develops recurrent symptoms of infection. The majority of patients with prior bacteriuria will re-acquire bacteriuria by 6 weeks after completion of treatment.<sup>3</sup>

### References

- <sup>1</sup> Nicolle LE, Strausbaugh LJ, Garibaldi RA. Infections and antibiotic resistance in nursing home. *Clin Microbiol Rev* 1996; 9:1-17.
- <sup>2</sup> Rudman D, Hontanosas A, Cohen Z, et al. Clinical correlates of bacteremia in a Veterans Administration extended care facility. *J Am Geriatric Soc* 1988;36:726-32.
- <sup>3</sup> Nicolle LE. Asymptomatic bacteriuria in the elderly. *Inf Dis Clin North Am* 1997;11:647-62.
- <sup>4</sup> Nicolle LE, Bjornson J, Harding GKM, et al. Bacteriuria in elderly institutionalized men. *New Eng J Med* 1983;309:1420-6.
- <sup>5</sup> Nicolle LE, Mayhew JW, Bryan L. Prospective randomized comparison of therapy and no therapy for asymptomatic bacteriuria in institutionalized women. *Am J Med* 1987; 83:27-33.
- <sup>6</sup> Ouslander JG, Schapira M, Schnelle JF, et al. Does eradicating bacteriuria affect the severity of chronic urinary incontinence in nursing home residents? *Ann Intern Med* 1996;122:749-54.
- <sup>7</sup> Nicolle LE, et al. Infectious Disease Society of America Guidelines for the Diagnosis and Treatment of Asymptomatic Bacteriuria in Adults. *Clin Inf Dis* 2005;40:643-654.
- <sup>8</sup> Loeb et al. Development of Minimum Criteria for the Initiation of Antibiotics in Residents of Long-Term-Care Facilities: Results of a Consensus Conference. *Inf Con Hosp Epi* 2001;22:120-124.
- <sup>9</sup> Orr P, Nicolle LE, Duckworth H, et al. Febrile urinary infection in the institutionalized elderly. *Am J Med* 1996; 100:71-77.



[www.minnesotaarc.org](http://www.minnesotaarc.org)

Members of MARC include Blue Cross and Blue Shield of Minnesota, HealthPartners, Medica, Minnesota Council of Health Plans, Minnesota Department of Health, Minnesota Medical Association, Minnesota Pharmacists Association, StratisHealth, and UCare Minnesota.

