

## Degree of Pyuria Alone Doesn't Predict Bacteriuria or Urinary Tract Infection

*Higher numbers of urinary white blood cells are associated with bacteriuria, but test characteristics are unacceptably poor.*

Pyuria is common in asymptomatic bacteriuria (ASB) and urinary tract infections (UTIs), but whether degree of pyuria is useful for predicting bacteriuria is unknown. In this cross-sectional study, researchers in a single U.S. health system compared rates of urine culture positivity at four cutoffs of white blood cells per high-power field (WBC/hpf) to define an optimal value for pyuria as a predictor of bacteriuria. Data were drawn from 46,000 hospitalizations of adults (mean age, 57; 80% women) who had both urinalysis and urine culture.

Bacteriuria was defined as any bacterial growth on urine culture, regardless of amount. At WBC/hpf cutoffs of 0 to 5, 5 to 10, 10 to 25, and >25, prevalence of bacteriuria was 25%, 28%, 33%, and 54%, respectively — a statistically significant trend. Positive predictive value across cutoffs ranged from 45% to 55%, and negative predictive value ranged from 70% to 80%. In patients with positive cultures, bacterial growth exceeded 50,000 colony forming units per mL about 80% of the time — even among those with only 0 to 5 WBC/hpf.

### COMMENT

A limitation of this study is the lack of data on symptoms, precluding differentiation of ASB from UTI. Despite this limitation, these results confirm that a greater degree of pyuria is associated with higher odds of bacteriuria. However, the relatively low positive and negative predictive values mean that the degree of pyuria alone does not provide enough information to reliably predict bacteriuria (much less UTI) and should not supplant clinical judgment in antibiotic treatment decisions.

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