# Medical Xpress

# Algorithm predicts urinary tract infection without microscopy

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The NoMicro classifier appears accurate for evaluating urine cultures in

cases of suspected urinary tract infection in the primary care setting without the need for microscopy, according to a study published in the January/February issue of the *Annals of Family Medicine*.

Gurpreet Dhanda, M.D., from the University of Kansas Medical Center in Kansas City, and colleagues redesigned a classifier (NoMicro) that does not depend on urine microscopy and retrospectively validated a machine learning prediction model for urine cultures internally (emergency department data set) and externally (primary care data set). Pathogenic urine culture growing ≥100,000 colony-forming units was the primary outcome, while predictor variables were: age; gender; dipstick urinalysis nitrites, leukocytes, clarity, glucose, protein, and blood; dysuria; abdominal pain; and history of urinary tract infection.

The researchers found that removal of microscopy features did not severely compromise performance under internal validation (receiver operating characteristic area under the curve [ROC-AUC], 0.86 and 0.88 for NoMicro/XGBoost and NeedMicro, respectively). In external validation, excellent performance was also achieved (NoMicro/random forests ROC-AUC, 0.85).

"Retrospective simulation suggested that NoMicro/random forests can be used to safely withhold antibiotics for low-risk patients, thereby avoiding antibiotic overuse," the authors write. "The NoMicro classifier appears appropriate for primary care. Prospective trials to adjudicate the balance of benefits and harms of using the NoMicro classifier are appropriate."

**More information:** Gurpreet Dhanda et al, Adaptation and External Validation of Pathogenic Urine Culture Prediction in Primary Care Using Machine Learning, *The Annals of Family Medicine* (2023). DOI: 10.1370/afm.2902

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