

Table S1 Effect-size estimation of predictors in association with the risk of positive urine culture

| Variables | Univariate analysis | | | Multivariate analysis | | |
|------------|---------------------|----------------------------|--------|-----------------------|----------------------------|--------|
| | OR | 95% CI | P | OR | 95% CI | P |
| Sex | 3.458 | 2.621-4.563 | <0.001 | 2.835 | 2.017-3.983 | <0.001 |
| Age | 1.026 | 1.015-1.037 | <0.001 | 1.013 | 1.0001-1.0251 [#] | 0.047 |
| Symptom | 1.069 | 1.001-1.140 | 0.045 | 1.094 | 1.014-1.178 | 0.020 |
| Diabetes | 1.458 | 1.027-2.071 | 0.035 | | | |
| Smoking | 1.404 | 1.047-1.883 | 0.023 | 1.766 | 1.225-2.546 | 0.002 |
| Urine WBC | 1.001 | 1.0006-1.0011 [#] | <0.001 | 1.001 | 1.0001-1.0005 [#] | 0.002 |
| NIT | 22.452 | 11.589-43.496 | <0.001 | 10.106 | 4.878-20.941 | <0.001 |
| PH | 1.416 | 1.177-1.703 | <0.001 | | | |
| Urine BACT | 1.001 | 1.0004-1.0008 [#] | <0.001 | 1.001 | 1.0002-1.0005 [#] | <0.001 |

OR >1 suggests risk factors to a positive urine culture. OR, odds ratio; 95% CI, 95% confidence interval; WBC, white blood cell; NIT, nitrite; PH, potential of hydrogen potential of hydrogen, BACT, bacteriuria. [#], reserved to four digits after decimal point. *, P<0.05.

Table S2 Features selection to construct models

| Features |
|---|
| Sex, Age, Height, Weight, Symptom, Duration of symptom, Hypertension, Years of hypertension, DM, Years of DM, CHD, Years of CHD, Pelvic surgery, Years of pelvic surgery, Cerebral infarction, Years of cerebral infarction, Urinary system anatomy, Gallstone, Smoking, Number of cigarettes/day, Years of smoking, Drinking, Vol. of drinking/30mL/day, Allergy, Blood type, UA, Cr, Glu, Ca, P, eGFR, SG, PH, NIT, Urine WBC, Urine RBC, Urine BACT, Numbers of stones, (Single)Stone location, (Single)length of stone, (Single)Height of stone, CT value of stone(s) |
| DM, diabetes mellitus; CHD, coronary heart disease; UA, uric acid; Cr, creatinine; Glu, glucose; Ca, calcium; P, phosphorus; eGFR, estimated glomerular filtration rate; SG, specific gravity; PH, potential of hydrogen potential of hydrogen; NIT, nitrite; WBC, white blood cell; RBC, red blood cell; BACT, bacteria; CT, computed tomography. |

Table S3 Hyperparameter values of the final models

| Classifier | Hyperparameter | Value |
|---------------|--|-------|
| GBDT | The maximum depth of variable interactions | 3 |
| | Number of trees | 100 |
| | Shrinkage | none |
| | Number of minobsinnode | none |
| Random forest | Number of trees | 11 |
| Adaboost | Number of estimators | 100 |
| | Learning rate | 1.0 |

GBDT, gradient boosting decision tree.