



Supplementary Figure 1 Prediction performance of random forest classifier model *via* clinical impact curve.

Supplementary Table 1 Analysis of clinical symptoms and signs of urinary tract infection in elderly patients with ovarian cancer after tumor cell reduction surgery

Symptoms or signs	NO. of cases	Percentage
Urinary irritation sign	87	12.91
Fever	86	12.76
Lack of urination or retention of urine	94	13.95
Kidney area tapping pain	67	9.94
Urethral orifice itching	57	8.46
Urine turbidity	45	6.68
Naked hematuria	33	4.90

Supplementary Table 2 The candidate variables screening associated with urinary tract infection *via* random forest classifier algorithm

Variables	Mean decrease accuracy	Mean decrease Gini
Age	24.92642	16.61181
BMI	11.16278	1.108362
Catheter	20.95411	10.03285
Catheter intubation times	4.939728	0.244436
Operation time	2.658041	0.092577
Blood loss	49.83049	35.81263
Hospitalization	23.86081	16.37236
Diabetes	5.72896	0.535487
Hypertension	-0.87051	0.00572
Antibiotics	0.108314	0.005992
Hypoproteinemia	8.184407	1.337511
NACT	-1.29994	0.049941

BMI: Body mass index; NACT: Neoadjuvant chemotherapy.

Supplementary Table 3 Prediction node and weight were allocated *via* artificial neural network algorithm

Steps	Weight
Intercept.to.1layhid1	-2.42E-01
Hypoproteinemia.to.1layhid1	-4.06E-01
Diabetes.to.1layhid1	1.38E+00
Blood_loss.to.1layhid1	1.06E+00
Catheter_intubation_times.to.1layhid1	1.07E+00
Catheter.to.1layhid1	-7.05E-01
BMI.to.1layhid1	-3.03E-01
Age.to.1layhid1	-1.85E+00
Intercept.to.1layhid2	2.25E+01
Hypoproteinemia.to.1layhid2	5.89E+00
Diabetes.to.1layhid2	1.17E+01
Blood_loss.to.1layhid2	-2.15E-01
Catheter_intubation_times.to.1layhid2	4.54E+00
Catheter.to.1layhid2	-1.28E+00
BMI.to.1layhid2	1.48E+00
Age.to.1layhid2	5.96E-01
Intercept.to.1layhid3	-2.98E-01
Hypoproteinemia.to.1layhid3	-4.16E-01
Diabetes.to.1layhid3	9.07E-01
Blood_loss.to.1layhid3	1.29E+00
Catheter_intubation_times.to.1layhid3	-4.84E-01
Catheter.to.1layhid3	1.36E+00
BMI.to.1layhid3	4.31E-01
Age.to.1layhid3	-4.50E-01
Intercept.to.1layhid4	1.11E+01
Hypoproteinemia.to.1layhid4	4.72E+00
Diabetes.to.1layhid4	2.64E+00
Blood_loss.to.1layhid4	-1.54E-01

Catheter_intubation_times.to.1layhid4	3.25E+00
Catheter.to.1layhid4	-1.20E+00
BMI.to.1layhid4	7.71E-01
Age.to.1layhid4	7.48E-01
Intercept.to.1layhid5	-2.75E-01
Hypoproteinemia.to.1layhid5	-8.41E-01
Diabetes.to.1layhid5	8.71E-01
Blood_loss.to.1layhid5	1.94E-01
Catheter_intubation_times.to.1layhid5	-5.15E-01
Catheter.to.1layhid5	1.53E+00
BMI.to.1layhid5	2.38E-01
Age.to.1layhid5	4.63E-01
Intercept.to.1layhid6	-7.37E-01
Hypoproteinemia.to.1layhid6	7.55E-01
Diabetes.to.1layhid6	3.92E-01
Blood_loss.to.1layhid6	4.07E-01
Catheter_intubation_times.to.1layhid6	4.02E-01
Catheter.to.1layhid6	1.33E+00
BMI.to.1layhid6	-4.65E-02
Age.to.1layhid6	1.09E+00
Intercept.to.2layhid1	5.80E-01
1layhid1.to.2layhid1	1.99E+00
1layhid2.to.2layhid1	-3.89E+01
1layhid3.to.2layhid1	2.47E+00
1layhid4.to.2layhid1	4.46E+02
1layhid5.to.2layhid1	1.14E-01
1layhid6.to.2layhid1	1.07E+00
Intercept.to.2layhid2	-1.09E+00
1layhid1.to.2layhid2	-1.83E+00
1layhid2.to.2layhid2	-1.34E-02
1layhid3.to.2layhid2	1.00E+00

1layhid4.to.2layhid2	3.60E-02
1layhid5.to.2layhid2	6.28E-01
1layhid6.to.2layhid2	9.39E-02
Intercept.to.2layhid3	2.02E+00
1layhid1.to.2layhid3	-2.23E-01
1layhid2.to.2layhid3	1.60E+01
1layhid3.to.2layhid3	-1.05E-01
1layhid4.to.2layhid3	-1.04E+02
1layhid5.to.2layhid3	1.98E-01
1layhid6.to.2layhid3	-8.01E-01
Intercept.to.2layhid4	-3.17E-01
1layhid1.to.2layhid4	-1.70E-01
1layhid2.to.2layhid4	-1.30E+00
1layhid3.to.2layhid4	1.10E+00
1layhid4.to.2layhid4	5.63E+01
1layhid5.to.2layhid4	-8.45E-01
1layhid6.to.2layhid4	-9.22E-01
Intercept.to.2layhid5	-2.50E-01
1layhid1.to.2layhid5	1.77E-02
1layhid2.to.2layhid5	2.24E+01
1layhid3.to.2layhid5	-2.89E-01
1layhid4.to.2layhid5	-7.20E+01
1layhid5.to.2layhid5	1.43E+00
1layhid6.to.2layhid5	6.42E-01
Intercept.to.2layhid6	7.68E-01
1layhid1.to.2layhid6	1.59E-01
1layhid2.to.2layhid6	2.58E-01
1layhid3.to.2layhid6	-1.02E+00
1layhid4.to.2layhid6	-3.07E+01
1layhid5.to.2layhid6	-6.62E-01
1layhid6.to.2layhid6	5.42E-01

Intercept.to.0	1.21E+00
2layhid1.to.0	-9.19E-01
2layhid2.to.0	-1.22E+00
2layhid3.to.0	1.35E+00
2layhid4.to.0	9.96E-01
2layhid5.to.0	-1.26E+00
2layhid6.to.0	-4.86E-01
Intercept.to.1	1.63E+00
2layhid1.to.1	1.01E+00
2layhid2.to.1	-1.77E+00
2layhid3.to.1	-1.30E+00
2layhid4.to.1	-2.22E+00
2layhid5.to.1	1.23E+00
2layhid6.to.1	-1.64E+00

BMI: Body mass index.

Supplementary Table 4 Performance for risk prediction models in training and validation cohorts

Training cohort	Sensitivity (95%)	Specificity (95%)	PPV (95%CI)	NPV (95%CI)	Kappa	Brier
RFC	97.14	98.25	90.67	99.49	0.625	0.061
	(96.57-97.71)	(97.70-98.80)	(90.10-91.24)	(98.94-100.04)		
SVM	88.57	96.76	82.67	97.98	0.677	0.070
	(88.00-89.14)	(96.19-97.33)	(82.12-83.22)	(97.45-98.51)		
DT	85.71	97.26	84.51	97.50	0.667	0.068
	(85.16-86.26)	(96.69-97.83)	(83.96-85.06)	(96.93-98.07)		
ANN	94.29	97.76	88.00	98.99	0.645	0.067
	(93.74-94.29)	(97.19-97.76)	(87.45-88.00)	(98.44-98.99)		

	94.84)	98.33)	88.55)	99.54)		
	88.57	97.01	83.78	97.98	0.681	0.065
	(88.02-	(96.44-	(83.23-	(97.41-		
XGboost	89.12)	97.58)	84.33)	98.55)		
Validation cohort						
	96.15	98.31	89.29	99.43	0.627	0.056
	(95.60-	(97.74-	(88.74-	(98.90-		
RFC	96.70)	98.88)	89.84)	99.96)		
	73.08	95.48(94.91-	70.37(69.82-	96.02	0.671	0.070
	(72.53-	96.05)	70.92)	(95.49-		
SVM	73.63)			96.55)		
	69.23	94.92	66.67	95.45	0.668	0.067
	(68.68-	(94.35-	(66.12-	(94.90-		
DT	69.78)	95.49)	67.22)	95.99)		
	88.46	97.74	85.19	98.30	0.646	0.064
	(87.89-	(97.19-	(84.64-	(97.73-		
ANN	89.03)	98.29)	85.74)	98.87)		
	76.92	96.05	74.07	96.59	0.670	0.063
	(76.37-	(95.50-	(73.52-	(96.04-		
XGboost	77.47)	96.60)	74.62)	97.14)		

RFC: Random forest classifier; SVM: Support vector machine; DT: Decision tree; ANN: Artificial neural network; XGboost: Xtreme gradient boosting; AUC: Area under curve; 95%CI: 95% confidence interval; PPV: Positive predictive value; NPV: Negative predictive value.