

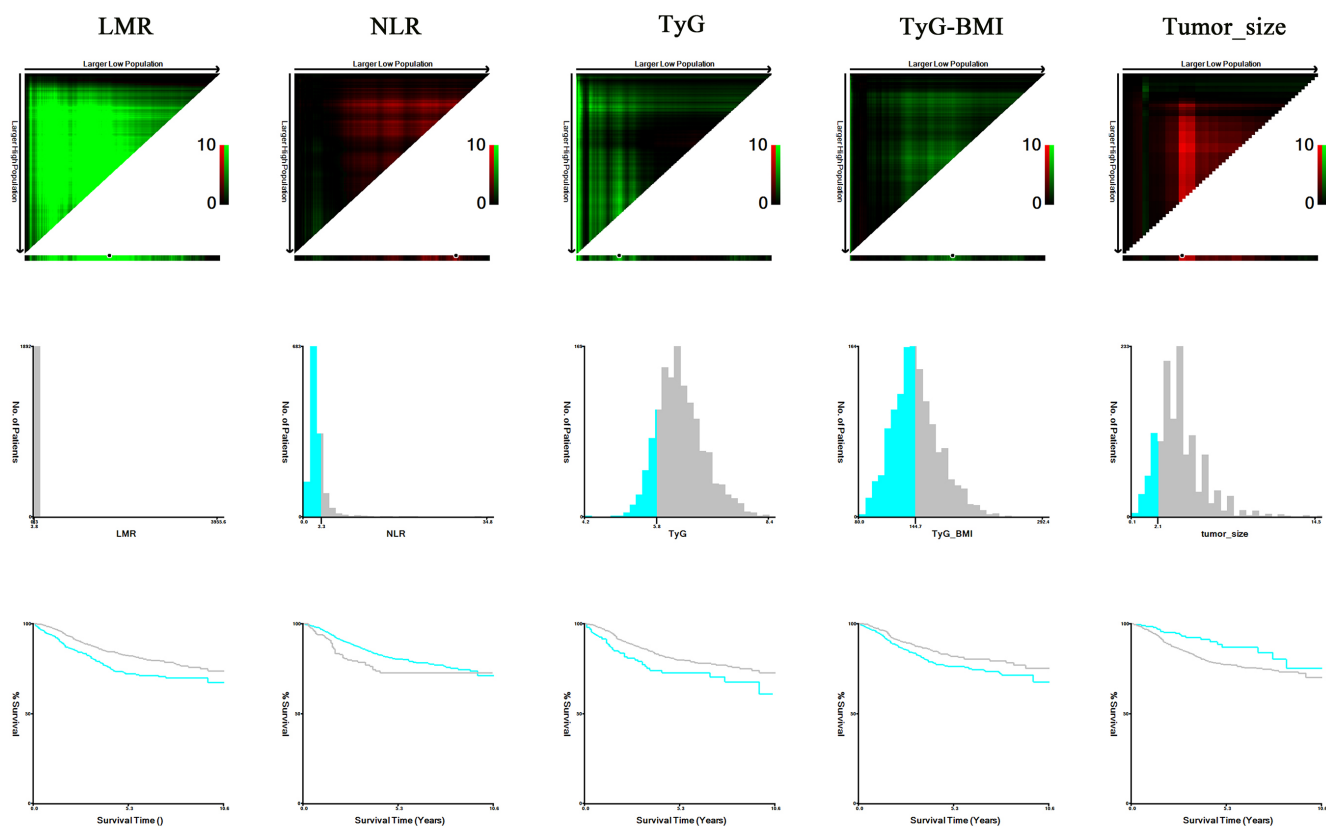


Figure S1 The optimal Cut-off values of continuous variables: LMR, NLR, TyG, TyG-BMI and Tumor size are 3.8, 3.3, 5.8, 144.7 and 2.1, respectively. LMR, lymphocyte-to-monocyte ratio; NLR, neutrophil-to-lymphocyte ratio; TyG, triglyceride-to-glucose index; TyG-BMI, triglyceride glucose-body mass index.

Table S1 Clinicopathological features of colorectal cancer	
Clinicopathological features	Number of colorectal cancer patients
Gender	
Male	1075 (56.79%)
Female	818 (43.21%)
Age (years)	
<60	839 (44.32%)
≥60	1054 (55.68%)
BMI (kg/m ²)	
≤18.5	177 (9.35%)
18.6–23.9	1063 (56.15%)
24–27.9	534 (28.21%)
≥28	119 (6.29%)
Diabetes	
Yes	419 (22.13%)
No	1474 (77.87%)
NLR	
<3.3	1568 (82.83%)
≥3.3	325 (17.17%)
LMR	
<3.8	795 (42.00%)
≥3.8	1098 (58.00%)
TyG	
<5.8	271 (14.32%)
≥5.8	1622 (85.68%)
TyG_BMI	
<144.7	997 (52.67%)
≥144.7	896 (47.33%)
PNI	
<50.5	952 (50.29%)
≥50.5	941 (49.71%)
Alb (g/L)	
<41.9	966 (51.03%)
≥41.9	927 (48.97%)
CEA (ng/mL)	
<5	1154 (60.96%)
≥5	739 (39.04%)
CA19-9 (U/mL)	
<30	1541 (81.41%)
≥30	352 (18.59%)
Tumor size (cm)	
<2.1	295 (15.58%)
≥2.1	1598 (84.42%)
Tumor differentiation	
High	715 (37.77%)
Medium	1072 (56.63%)
Low/undifferentiated	106 (5.60%)
pT stage	
pT1–2	584 (30.85%)
pT3–4	1309 (69.15%)
pN stage	
pN0	1158 (61.17%)
pN1	466 (24.62)
pN2	269 (14.21%)
M stage	
M0	1788 (94.45%)
M1	105 (5.55%)
UICC	
I–II stage	1127 (59.54%)
III–IV stage	766 (40.46%)
Perineural invasion	
Negative	1379 (72.85%)
Positive	514 (27.15%)
Vascular invasion	
Negative	1494 (78.92%)
Positive	399 (21.08%)
TyG, triglyceride-to-glucose index; TyG-BMI, triglyceride-to-glucose index-body mass index; NLR, neutrophil-to-lymphocyte ratio; LMR, lymphocyte-to-monocyte ratio; CA19-9, carbohydrate antigen 19-9; CEA, carcinoembryonic antigen; UICC, Union for International Cancer Control.	

Table S2 Univariate and multivariate analysis for overall survival of colorectal cancer

Clinicopathological features	Univariate analysis		Multivariate analysis	
	HR (95% CI)	P	HR (95% CI)	P
Gender				
Male	1.391 (1.111–1.743)	0.004		
Female	Reference			
BMI (kg/m ²)				
18.6–23.9	0.827 (0.579–1.182)	0.298		
24–27.9	0.731 (0.494–1.081)	0.116		
≥28	0.818 (0.469–1.426)	0.478		
≤18.5	Reference			
Diabetes				
Yes	0.774 (0.576–1.039)	0.089		
No	Reference			
NLR				
<3.3	0.665 (0.512–0.864)	0.002		
≥3.3	Reference			
PNI				
<50.5	1.163 (0.936–1.447)	0.174		
≥50.5	Reference			
Alb (g/L)				
<41.9	1.237 (0.993–1.541)	0.058		
≥41.9	Reference			
TyG-BMI				
<144.7	1.271 (1.019–1.585)	0.033		
≥144.7	Reference			
Tumor size (cm)				
<2.1	0.677 (0.476–0.961)	0.029		
≥2.1	Reference			
pT stage				
pT1–2	0.343 (0.248–0.475)	0		
pT3–4	Reference			
pN stage				
pN1	2.08 (1.615–2.678)	0		
pN2	3.342 (2.54–4.398)	0		
pN0	Reference			
M stage				
M1	6.792 (5.166–8.929)	0		
M0	Reference			
Vascular invasion				
Negative	0.444 (0.351–0.56)	0		
Positive	Reference			

The independent prognostic factors were obtained by using the “forward conditional” analysis method. TyG, triglyceride-to-glucose index; TyG-BMI, triglyceride-to-glucose index-body mass index; NLR, neutrophil-to-lymphocyte ratio.

Table S3 Survival prognosis analysis of TyG in the BMI subgroup and the PNI subgroup

Subgroup	Low-TyG	High-TyG	HR (95% CI)	P
PNI				
<50.5	183 (19.2%)	769 (80.8%)	1.557 (1.107–2.190)	0.011*
≥50.5	88 (9.4%)	853 (90.6%)	1.171 (0.706–1.940)	0.541
BMI (kg/m ²)				
≤18.5	52 (29.4%)	125 (70.6%)	0.954 (0.460–1.979)	0.900
18.6–23.9	175 (16.5%)	888 (83.5%)	1.535 (1.089–2.164)	0.014*
24–27.9	39 (7.3%)	495 (92.7%)	1.371 (0.632–2.974)	0.425
≥28	5 (4.2%)	114 (95.8%)	2.457 (0.567–10.644)	0.229

*, P<0.05. Low-TyG represents TyG <5.8 and high-TyG represents TyG ≥5.8; TyG ≥5.8 was regarded as reference. TyG, triglyceride-to-glucose index; BMI, body mass index; PNI, prognostic nutritional index.

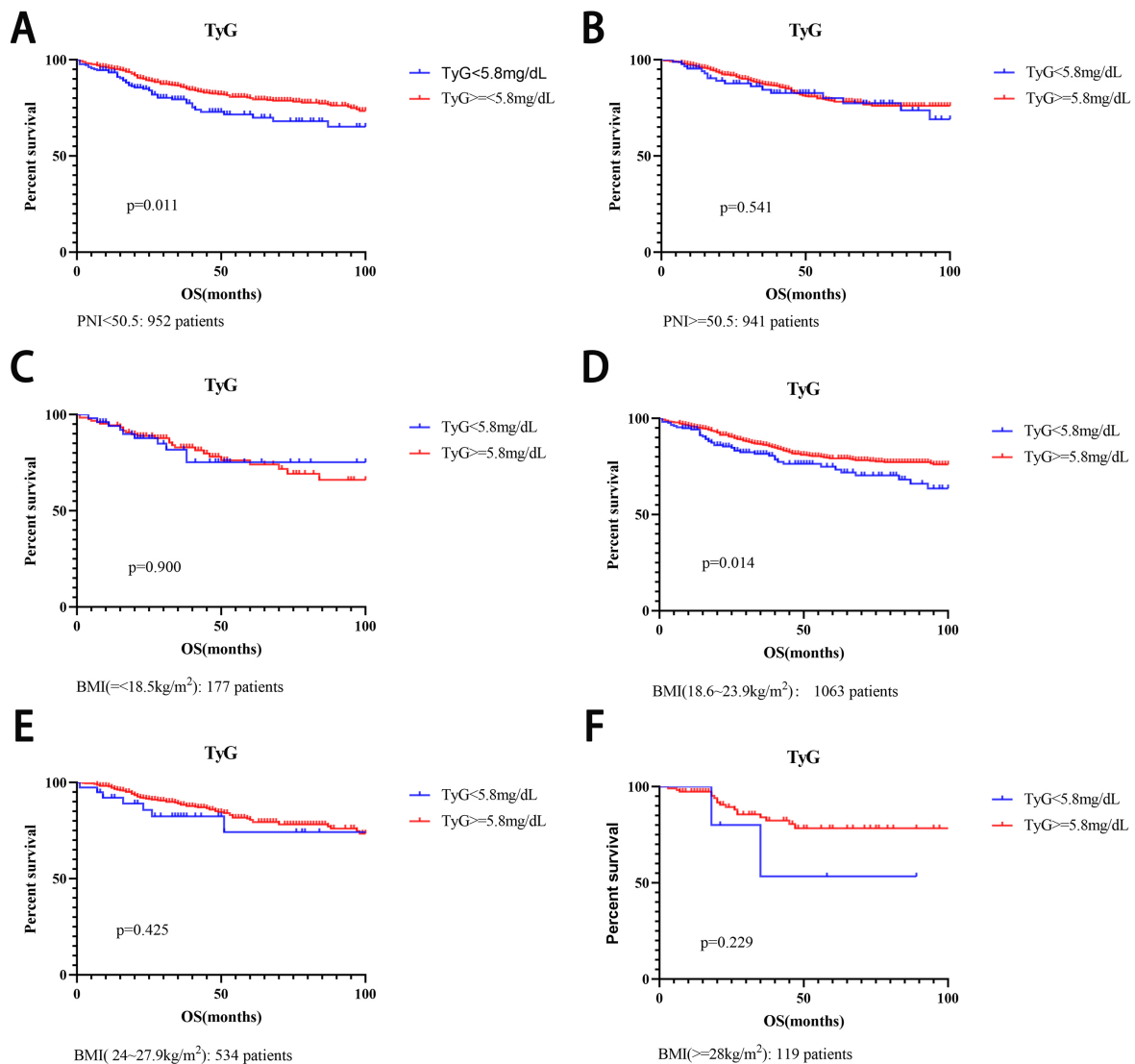
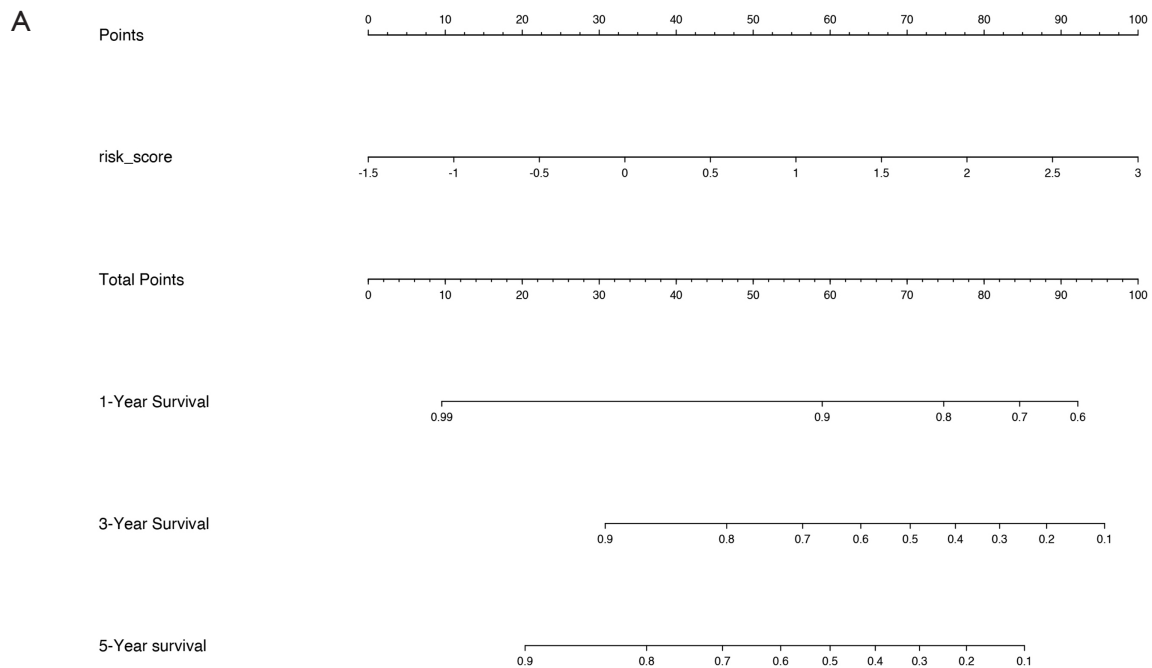


Figure S2 Survival analysis of TyG in subgroups of BMI and PNI patients. KM curves of OS in the PNI <50.5, PNI ≥50.5, BMI ≤18.5 kg/m², BMI 18.6–23.9 kg/m², BMI 24–27.9 kg/m², BMI ≥28 kg/m² respectively. TyG, triglyceride-to-glucose index; KM, Kaplan-Meier; BMI, body mass index; PNI, prognostic nutritional index; OS, overall survival.



B Clinical Risk Score and Survival Probability Calculator

Please fill in the clinical parameters:

Age

☒ <60y

☐ ≥60y

LMR

☒ <3.8

☐ ≥3.8

TyG

☒ <5.8

☐ ≥5.8

CEA (ng/mL)

☒ ≤5

☐ >5

CA199 (U/mL)

☒ <30

☐ ≥30

Tumor differentiation

high differentiated

UICC stage

☒ I-II stage

☐ III-IV stage

Perineural invasion

☒ Pos

☐ Neg

calculate

Calculation result:

Risk score = -0.81

Survival probability:

1-year survival probability = 99.76%

3-year survival probability = 99.41%

5-year survival probability = 99.17%

Parameter Description:

1. TyG = $\ln[\text{fasting triglycerides(mg/dL)} \times \text{fasting blood glucose(mg/dL)} / 2]$

2. For other parameter units, please refer to the clinical test report.

Figure S3 Clinical application of colorectal cancer survival prediction model. (A) The nomogram of the model risk score. (B) Online procedures for the clinical application of the model. LMR, lymphocyte-to-monocyte ratio; TyG, triglyceride-to-glucose index; CA19-9, carbohydrate antigen 19-9; CEA, carcinoembryonic antigen; UICC, Union for International Cancer Control.