



Figure S1. This figure displays the density distribution of LASSO scores across the entire study cohort. This distribution reflects the heterogeneity in preoperative metabolic risk within the patient population.

Variable	Estimate	S.E	HR (95%CI)	Z	P
lasso_score	0.947	0.264	2.579 (1.537, 4.327)	3.587	<0.001
Radiotherapy					
0	Ref				
1	-0.517	0.220	0.596 (0.387, 0.919)	-2.345	0.019
Ki67					
0	Ref				
1	0.537	0.210	1.711 (1.134, 2.584)	2.557	0.011
APTT	-0.047	0.032	0.954 (0.896, 1.015)	-1.488	0.137

Figure S2. Multivariate Cox proportional hazards regression analysis [of the](#) variable selection results.