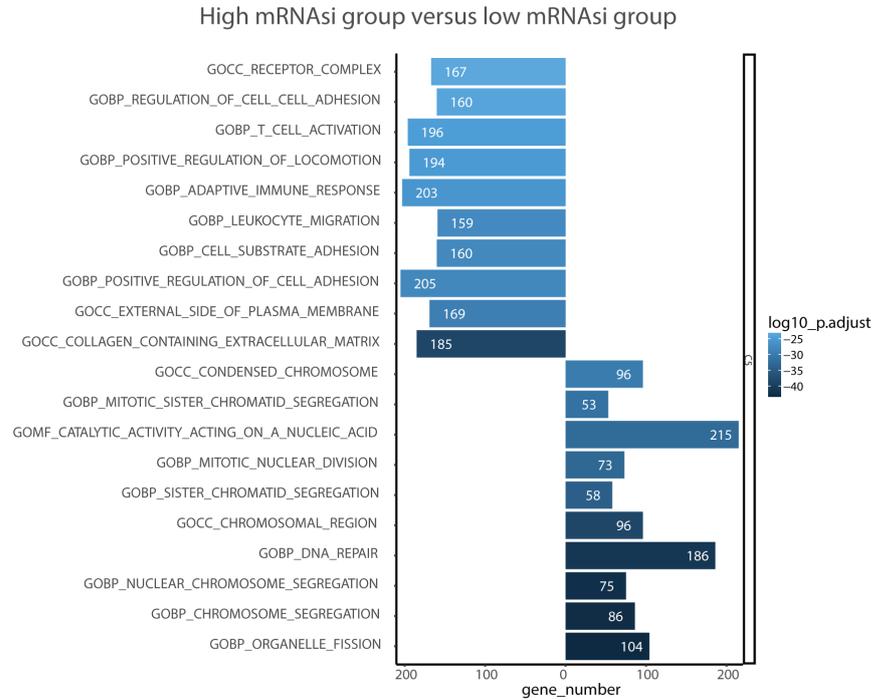


Table S1 Patients Characteristics of the GSE49710 and E-MTAB-8248 dataset

Characteristic	Subtypes	GSE49716	E-MTAB-8248
		Overall, mean \pm SD or N (%)	Overall, mean \pm SD or N (%)
N		498	223
Age (days)		758 \pm 1031	1040 \pm 1320
Age_group	<18 months	300 (60.2)	103 (46.2)
	\geq 18 months	198 (39.8)	120 (53.8)
Status	Live	393 (78.9)	181 (81.2)
	Death	105 (21.1)	42 (18.8)
Overall survival (days)		2185.42 \pm 1370.89	2230 \pm 1450
INSS_STAGE	1	121 (24.3)	29 (13.0)
	2	78 (15.7)	39 (17.5)
	3	63 (12.7)	36 (16.1)
	4	183 (36.7)	89 (39.9)
	4S	53 (10.6)	30 (13.5)
MYCN status	Non-amplification	401 (80.5)	176 (78.9)
	Amplification	92 (18.5)	46 (20.6)
	No data	5 (1.0)	1 (0.4)

A



B

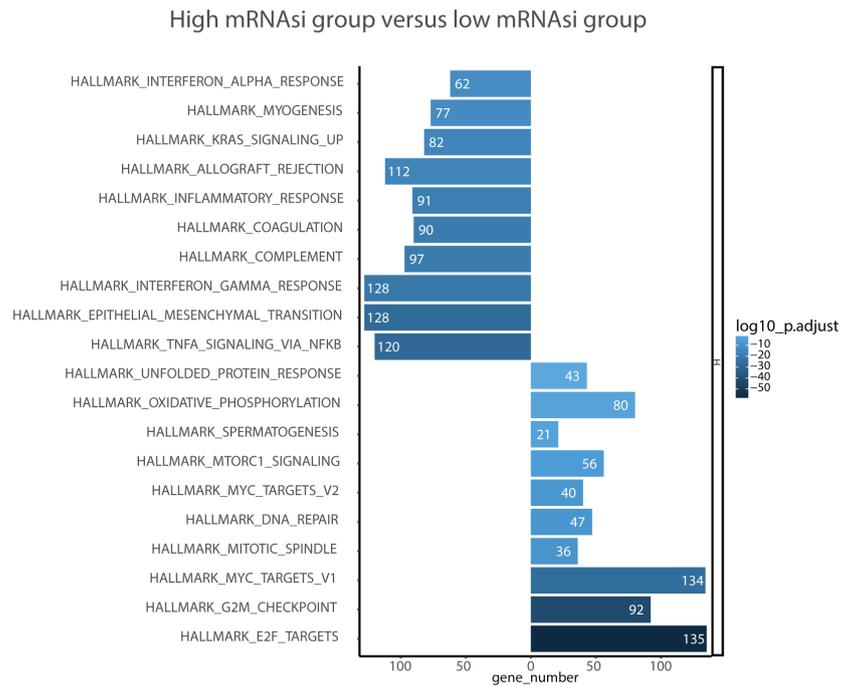


Figure S1 The GSEA of DEGs between high and low mRNasi. (A) The top 10 GO gene sets enrichment (C5). (B) The top 10 hallmark gene sets enrichment. The gene sets with NES < 0 are listed on the left, and the gene sets with NES > 0 are listed on the right. GO, Gene Ontology; NES, normalized enrichment score; GSEA, gene set enrichment analysis; DEGs, differentially expressed genes; mRNasi, messenger RNA expression-based stemness index.

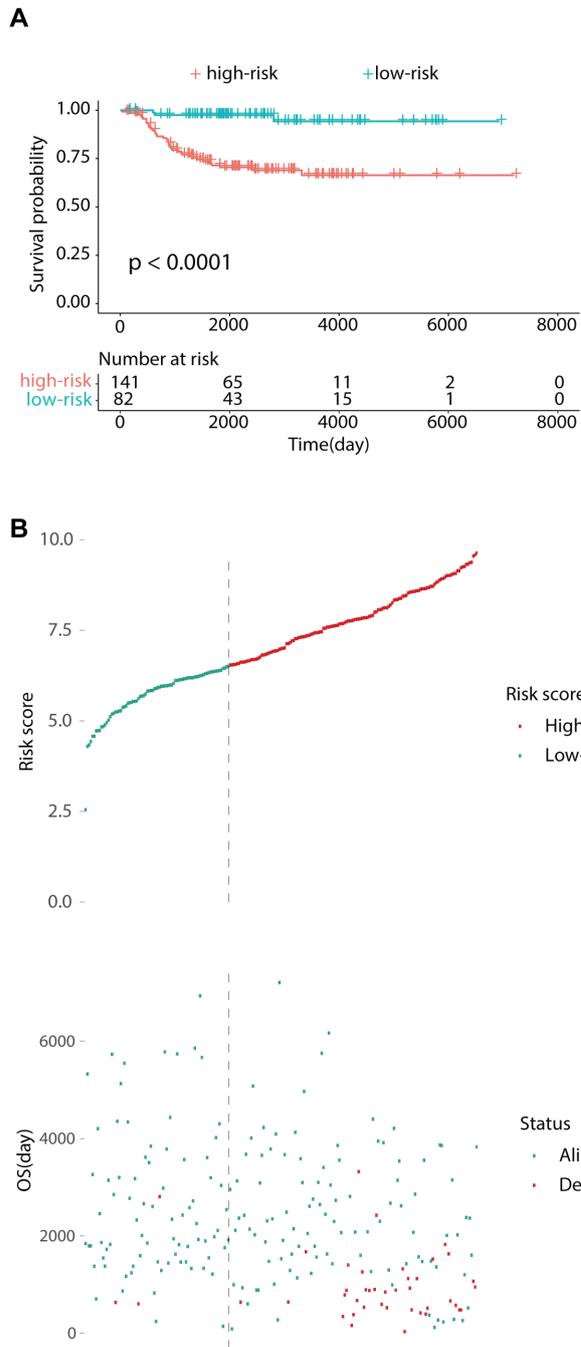


Figure S2 The external verification of the four-gene signature. (A) The KM curve for OS predicting of the four-gene signature in E-MTAB-8248. (B) The distribution of risk scores, the association of risk scores and OS in E-MTAB-8248. KM, Kaplan-Meier curve; OS, overall survival.

Table S2 Comparison of immune infiltration-related genes as assessed by ESTIMATE, CIBERSORT, MCPcounter, and xCell

Sig_names	Pvalue	High	Low	Statistic	P.adj	Log10pvalue	Significance
pro_B-cells_xCell	7.59E-52	0.624503	-0.65648	1.28098	7.51E-50	51.11974	****
Melanocytes_xCell	2.57E-47	-0.60958	0.588222	-1.1978	1.27E-45	46.58964	****
Tgd_cells_xCell	1.52E-44	0.602928	-0.61795	1.220878	5.03E-43	43.81732	****
Th2_cells_xCell	8.38E-33	0.511512	-0.5229	1.03441	2.07E-31	32.07679	****
Th1_cells_xCell	5.91E-30	0.49735	-0.50403	1.001382	1.17E-28	29.22868	****
Osteoblast_xCell	1.50E-26	0.432907	-0.46269	0.895594	2.47E-25	25.82401	****
HSC_xCell	3.00E-25	-0.45143	0.415564	-0.86699	4.24E-24	24.52357	****
CLP_xCell	2.24E-23	0.412387	-0.42497	0.837353	2.77E-22	22.64973	****
Erythrocytes_xCell	8.44E-23	0.361926	-0.43594	0.797871	9.28E-22	22.07385	****
CD4+_naive_T-cells_xCell	6.26E-22	-0.40959	0.365033	-0.77462	6.20E-21	21.20322	****
CD8+_naive_T-cells_xCell	8.41E-22	0.408336	-0.42712	0.835461	7.57E-21	21.07499	****
Mast_cells_xCell	1.19E-20	-0.41393	0.408401	-0.82233	9.82E-20	19.92451	****
Macrophages_M2_xCell	1.77E-17	-0.36736	0.319039	-0.6864	1.35E-16	16.75229	****
CD4+_Tem_xCell	4.49E-17	-0.35314	0.322876	-0.67602	3.18E-16	16.3475	****
Mesangial_cells_xCell	1.16E-16	-0.373	0.365348	-0.73835	7.63E-16	15.9373	****
Sebocytes_xCell	2.21E-15	-0.35344	0.324693	-0.67813	1.37E-14	14.65609	****
Monocytic_lineage_MCPcounter	1.31E-14	-0.31702	0.331742	-0.64876	7.65E-14	13.88132	****
Plasma_cells_xCell	7.90E-14	0.292339	-0.34219	0.634534	4.35E-13	13.10226	****
aDC_xCell	2.04E-13	-0.31209	0.344778	-0.65686	1.06E-12	12.69127	****
Myeloid_dendritic_cells_MCPcounter	4.65E-13	-0.30445	0.309747	-0.6142	2.30E-12	12.33209	****
CD8+_Tem_xCell	5.25E-13	-0.28343	0.243849	-0.52728	2.48E-12	12.2797	****
ImmuneScore_estimate	2.00E-12	-0.30277	0.28725	-0.59002	9.00E-12	11.69908	****
ESTIMATEScore_estimate	2.19E-12	-0.29812	0.296791	-0.59491	9.41E-12	11.66027	****
Class-switched_memory_B-cells_xCell	7.58E-12	-0.2531	0.165702	-0.4188	3.13E-11	11.12053	****
CD8+_T-cells_xCell	1.31E-11	-0.28693	0.238596	-0.52552	5.20E-11	10.88188	****
CD4+_T-cells_xCell	5.61E-11	-0.28669	0.250334	-0.53703	2.14E-10	10.25117	****
Neurons_xCell	7.02E-11	-0.20129	0.282099	-0.48339	2.57E-10	10.15364	****
MEP_xCell	5.33E-10	0.227634	-0.38165	0.609285	1.89E-09	9.273112	****
NK_cells_MCPcounter	1.97E-09	-0.25785	0.244688	-0.50254	6.71E-09	8.706543	****
Megakaryocytes_xCell	2.07E-09	-0.26074	0.246052	-0.50679	6.84E-09	8.683333	****
StromalScore_estimate	3.09E-09	-0.25252	0.255219	-0.50774	9.88E-09	8.509465	****
CD4+_Tcm_xCell	3.46E-09	-0.28923	0.222837	-0.51207	1.07E-08	8.460616	****
Tregs_xCell	6.80E-09	-0.24958	0.126033	-0.37561	2.04E-08	8.167262	****
Macrophages_M2_CIBERSORT	9.37E-09	-0.25036	0.19064	-0.441	2.73E-08	8.028062	****
Endothelial_cells_MCPcounter	2.19E-08	-0.21682	0.221515	-0.43834	6.21E-08	7.658569	****
T_cells_MCPcounter	3.51E-08	-0.24834	0.219247	-0.46759	9.66E-08	7.454143	****
Platelets_xCell	1.13E-07	-0.23725	0.219874	-0.45712	3.01E-07	6.9486	****
B_cells_memory_CIBERSORT	1.40E-07	0.117725	-0.23613	0.35385	3.66E-07	6.852464	****
cDC_xCell	1.78E-07	-0.23876	0.215837	-0.4546	4.51E-07	6.75046	****
Monocytes_xCell	2.48E-07	-0.20594	0.147721	-0.35366	6.13E-07	6.606303	****
iDC_xCell	1.94E-06	0.200012	-0.22561	0.425625	4.68E-06	5.712619	****
Plasma_cells_CIBERSORT	2.89E-06	0.063779	-0.20606	0.269841	6.81E-06	5.539192	****
Smooth_muscle_xCell	3.09E-06	0.1174	-0.27333	0.390731	7.11E-06	5.51046	****
Cytotoxic_lymphocytes_MCPcounter	5.61E-06	-0.20408	0.19616	-0.40024	1.26E-05	5.250774	****
CMP_xCell	6.58E-06	0.146851	-0.18558	0.332435	1.45E-05	5.182073	****
T_cells_CD4_memory_resting_CIBERSORT	7.84E-06	-0.21436	0.129451	-0.34381	1.69E-05	5.105585	****
Chondrocytes_xCell	3.80E-05	-0.18345	0.142869	-0.32632	8.01E-05	4.419815	****
Adipocytes_xCell	4.13E-05	-0.1941	0.158121	-0.35223	8.53E-05	4.38364	****
Skeletal_muscle_xCell	5.40E-05	0.035792	-0.17556	0.211354	1.09E-04	4.267362	****
CD8+_Tcm_xCell	7.08E-05	-0.18586	0.122644	-0.30851	1.40E-04	4.150135	****
Fibroblasts_MCPcounter	1.50E-04	-0.157	0.19706	-0.35406	2.91E-04	3.823753	***
Eosinophils_xCell	1.84E-04	-0.17355	0.154897	-0.32845	3.47E-04	3.735455	***
Neutrophils_xCell	1.86E-04	0.10236	-0.18902	0.291377	3.47E-04	3.730593	***
Hepatocytes_xCell	2.51E-04	-0.12878	-0.05211	-0.07667	4.60E-04	3.600515	***
Macrophages_xCell	3.20E-04	-0.17599	0.141214	-0.3172	5.75E-04	3.494816	***
ly_Endothelial_cells_xCell	3.25E-04	-0.1372	0.129039	-0.26624	5.75E-04	3.487546	***
B_cells_naive_CIBERSORT	0.001635	-0.13531	0.029551	-0.16486	0.00284	2.786407	**
MSC_xCell	0.002266	0.131946	-0.12956	0.261509	0.003868	2.644725	**
NK_cells_resting_CIBERSORT	0.002739	-0.01073	-0.17912	0.168389	0.004537	2.562474	**
CD8_T_cells_MCPcounter	0.00275	-0.12974	0.114663	-0.2444	0.004537	2.560687	**
Macrophages_M0_CIBERSORT	0.004947	-0.12929	0.096471	-0.22576	0.008028	2.305689	**
Myocytes_xCell	0.011185	-0.10466	-0.03279	-0.07187	0.017859	1.951379	*
Mast_cells_activated_CIBERSORT	0.013301	-0.17647	0.082774	-0.25925	0.020902	1.876115	*
NKT_xCell	0.014771	-0.13352	0.097664	-0.23119	0.022849	1.830596	*
DC_xCell	0.016906	-0.10336	0.108747	-0.2121	0.025749	1.771962	*
Preadipocytes_xCell	0.018384	0.092771	-0.12549	0.218264	0.027576	1.735564	*
Monocytes_CIBERSORT	0.025282	-0.10741	0.001993	-0.1094	0.037357	1.597192	*
pDC_xCell	0.027544	-0.11099	0.030046	-0.14104	0.040101	1.559968	*
Neutrophils_CIBERSORT	0.032906	-0.0526	-0.10597	0.053378	0.047213	1.482727	*
naive_B-cells_xCell	0.036533	-0.09526	-0.02248	-0.07278	0.051669	1.43731	*
T_cells_follicular_helper_CIBERSORT	0.041315	0.005431	-0.13411	0.139544	0.057608	1.383891	*
T_cells_CD8_CIBERSORT	0.048048	-0.12291	0.041053	-0.16396	0.066067	1.318321	*
MPP_xCell	0.060971	0.062202	-0.12066	0.182866	0.082687	1.214877	+
Memory_B-cells_xCell	0.066906	-0.09823	-0.04316	-0.05506	0.089509	1.174534	+
Macrophages_M1_CIBERSORT	0.084148	-0.06063	-0.04395	-0.01668	0.111075	1.074956	+
Pericytes_xCell	0.097515	0.06508	-0.07266	0.137739	0.127026	1.010927	+
Macrophages_M1_xCell	0.118875	-0.06599	0.068703	-0.13469	0.15284	0.924908	+
T_cells_CD4_naive_CIBERSORT	0.136547	-0.11527	-0.04897	-0.06629	0.172592	0.864716	+
NK_cells_activated_CIBERSORT	0.137725	-0.10295	0.033783	-0.13673	0.172592	0.860987	+
T_cells_CD4_memory_activated_CIBERSORT	0.143946	-0.11947	-0.05846	-0.06101	0.178133	0.841801	+
Basophils_xCell	0.153977	0.034953	-0.10776	0.142709	0.188194	0.812544	+
mv_Endothelial_cells_xCell	0.223623	-0.04889	0.026174	-0.07507	0.269984	0.650484	+
Dendritic_cells_activated_CIBERSORT	0.238855	-0.04326	-0.08503	0.041776	0.284899	0.621866	+
T_cells_gamma_delta_CIBERSORT	0.27677	-0.06823	-0.10448	0.036254	0.326194	0.55788	+
Mast_cells_resting_CIBERSORT	0.308185	-0.04197	-0.08704	0.045073	0.358945	0.511188	+
Endothelial_cells_xCell	0.318709	-0.04281	0.03971	-0.08252	0.366886	0.496605	+
Eosinophils_CIBERSORT	0.362759	-0.02664	-0.05918	0.032536	0.412795	0.440381	+
B_lineage_MCPcounter	0.395245	-0.05244	-0.00442	-0.04802	0.444651	0.403133	+
CD4+_memory_T-cells_xCell	0.425404	0.001076	-0.05692	0.057995	0.473202	0.371198	+
Fibroblasts_xCell	0.445453	-0.10574	-0.00843	-0.09731	0.488115	0.351198	+
T_cells_regulatory_(Tregs)_CIBERSORT	0.448672	-0.05767	-0.02854	-0.02914	0.488115	0.348071	+
Epithelial_cells_xCell	0.459906	-0.05085	9.07E-04	-0.05176	0.494899	0.337331	+
Neutrophils_MCPcounter	0.487413	-0.02897	-0.06849	0.039523	0.518859	0.312103	+
NK_cells_xCell	0.529771	-0.04409	-0.02236	-0.02172	0.557951	0.275911	+
B-cells_xCell	0.537145	-0.0503	-0.06909	0.018789	0.559762	0.269908	+
Astrocytes_xCell	0.668341	-0.05423	-0.04964	-0.00459	0.689227	0.175002	+
Keratinocytes_xCell	0.704456	-0.01324	-0.00849	-0.00474	0.718981	0.152146	+
GMP_xCell	0.941392	0.002616	-0.01869	0.021307	0.950998	0.026229	+
Dendritic_cells_resting_CIBERSORT	0.988882	-0.08526	-0.07567	-0.00959	0.988882	0.004856	+

*, P<0.05; **, P<0.01; ***, P<0.001; ****, P<0.0001; +, not significant.

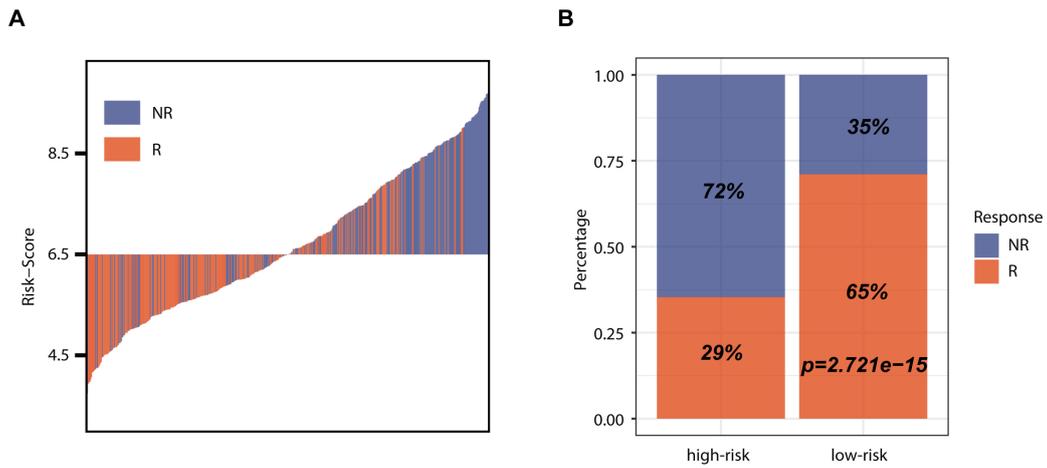


Figure S3 Differences in immunotherapy estimated response between high- and low-risk score groups revealed by TIDE algorithm. (A) Risk score stratification reveals diverse immune response patterns in patients. (B) Proportion of patients responding to immunotherapy in each risk group. R, response; NR, no response

Global Schoenfeld Test p: 4.907e-05

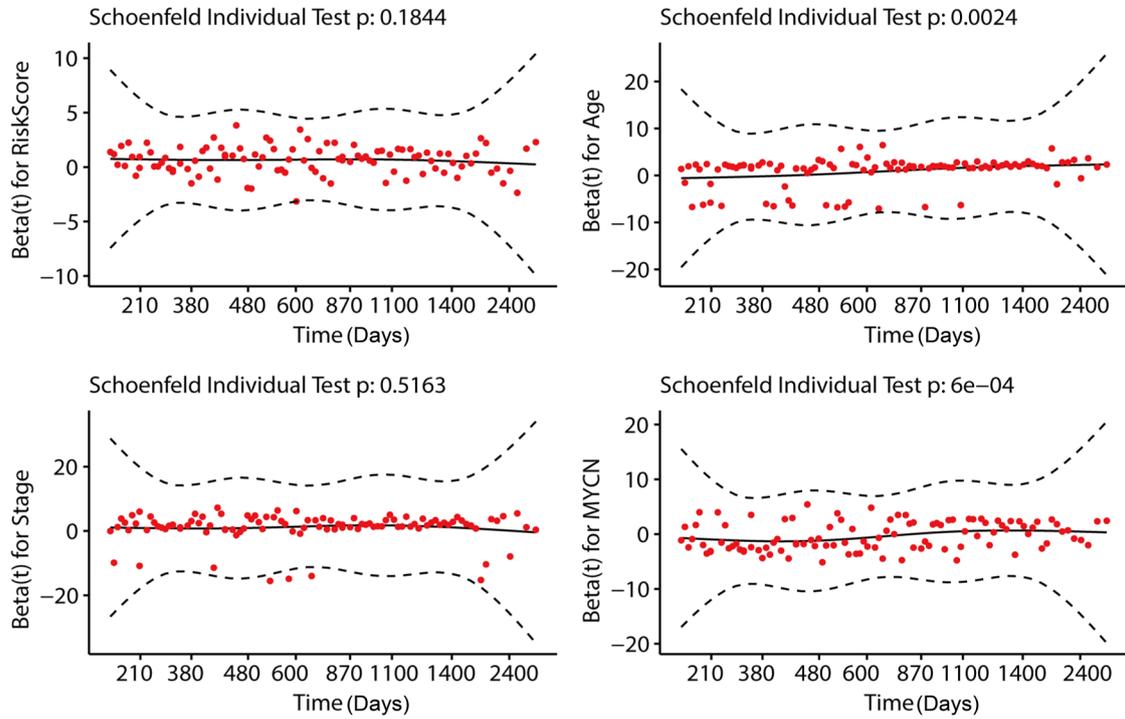


Figure S4 Schoenfeld test on proportional hazard assumption for the nomogram model. The Schoenfeld test for estimating time-varying covariance of the nomogram model.