Table S1 The comparison between the training set and the validation set

Characteristic	Subcategory	No.	Subgroup		P
			Training set	Validation set	
Total No.		5,900	4,131	1,769	
Status	Alive	1,311	898	413	0.396
	Cancer-specific mortality	4,030	2,839	1,191	
	Competing mortality	559	394	165	
Age, years	0–59	2,707	1,903	804	0.840
	60–74	2,138	1,487	651	
	75+	1,055	741	314	
Gender	Female	2,511	1,768	743	0.570
	Male	3,389	2,363	1,026	
Race	White	4,701	3,294	1,407	0.608
	Black	544	372	172	
	Other/unknown	655	465	190	
Marital status	Married	3,083	2,130	953	0.448
	Divorced	456	319	137	
	Single	1,500	1,073	427	
	Widowed	597	427	170	
	Other/unknown	264	182	82	
Tumor site	Supratentorial	3,070	2,143	927	0.088
	Infratentorial	442	289	153	
	Overlapping	687	496	191	
	Brain, NOS	1,701	1,203	498	
Subtype	DLBCL	4,247	2,991	1,256	0.528
	Non-DLBCL	348	242	106	
	Lymphoma, NOS	1,305	898	407	
Surgery	Biopsy	4,394	3,079	1,315	0.092
	STR	220	138	82	
	GTR	198	136	62	
	Partial lobectomy	277	208	69	
	Lobectomy	311	222	89	
	Unknown-type	500	348	152	
Radiation	No	3,242	2,263	979	0.691
	Yes	2,658	1,868	790	
Chemotherapy	No	2,706	1,898	808	0.562
	Yes	3,194	2,333	961	
Coexistence with other malignancy	No	5,689	3,982	1,707	0.847
	Yes	211	149	62	
HIV	Negative	4,993	3,489	1,504	0.584
	Positive	907	642	265	

NOS, not otherwise specified; DLBCL, diffuse large B-cell lymphoma; STR, subtotal resection; GTR, gross total resection; HIV, human immunodeficiency virus.

Table S2 Formulae for the calculation of survival probability

Overall survival

  Model =0

    +0 (if age, 0–59)

    +0.526293 (if age, 60–74)

    +0.939317 (if age, 75+)

    +0 (if gender, female)

    +0.115300 (if gender, male)

    +0 (if marital, married)

    +0.193418 (if marital, divorced)

    −0.034595 (if marital, single)

    +0.126721 (if marital, widowed)

    −0.008761 (if marital, other/unknown)

    +0 (if site, supratentorial)

    +0.112518 (if site, infratentorial)

    +0.134057 (if site, overlapping)

    +0.159675 (if site, brain, NOS)

    +0 (if subtype, DLBCL)

    −0.645093 (if subtype, non-DLBCL)

    −0.085316 (if subtype, lymphoma, NOS)

    +0 (if surgery, biopsy)

    −0.247200 (if surgery, STR)

    −0.667991 (if surgery, GTR)

    −0.163686 (if surgery, partial lobectomy)

    −0.330330 (if surgery, lobectomy)

    −0.152034 (if surgery, unknown-type)

    +0 (if radiation, NO)

    −0.180341 (if radiation, Yes)

    +0 (if chemotherapy, NO)

    −0.908290 (if chemotherapy, Yes)

    +0 (if coexistence, only one)

    −0.682990 (if coexistence, multi-primaries)

    +0 (if HIV, negative)

    +1.214581 (if HIV, positive)

  Estimated 1-year survival probability $=0.814123^{\exp(model)}$

  Estimated 3-year survival probability $=0.6765877^{\exp(model)}$

  Estimated 5-year survival probability $=0.5864965^{\exp(model)}$

Cancer-specific survival

  Model =0

    +0 (if age, 0–59)

    +0.36130 (if age, 60–74)

    +0.61834 (if age, 75+)

    +0 (if site, supratentorial)

    +0.05679 (if site, infratentorial)

    +0.14933 (if site, overlapping)

    +0.10229 (if site, brain, NOS)

    +0 (if subtype, DLBCL)

    −0.52090 (if subtype, non-DLBCL)

    −0.09284 (if subtype, lymphoma, NOS)

    +0 (if surgery, biopsy)

    −0.19801 (if surgery, STR)

    −0.63428 (if surgery, GTR)

    +0.03171 (if surgery, partial lobectomy)

    −0.25750 (if surgery, lobectomy)

    −0.08247 (if surgery, unknown-type)

    +0 (if chemotherapy, no)

    −0.57635 (if chemotherapy, yes)

    +0 (if coexistence, only one)

    −0.95608 (if coexistence, multi-primaries)

    +0 (if HIV, negative)

    +1.18983 (if HIV, positive)

  Estimated 1-year survival probability $=0.8305324^{\exp(model)}$

  Estimated 3-year survival probability $=0.6941114^{\exp(model)}$

  Estimated 5-year survival probability $=0.6140659^{\exp(model)}$

NOS, not otherwise specified; DLBCL, diffuse large B-cell lymphoma; STR, subtotal resection; GTR, gross total resection; HIV, human immunodeficiency virus.

Table S3 Clinical characteristics of the external validation cohort

Characteristic	Subcategory	No.	Percent (%)
Median survival time	27 months		
Total No.		163	100.0
Status	Alive	103	63.2
	Cancer-specific mortality	59	36.2
	Competing mortality	1	0.6
Age, years	0–59	112	68.7
	60–74	49	30.0
	75+	2	1.2
Gender	Female	68	41.7
	Male	95	58.3
Race	White	0	0
	Black	0	0
	Other/unknown	163	100.0
Marital status	Married	153	93.9
	Divorced	4	2.5
	Single	4	2.5
	Widowed	2	1.2
	Other/unknown	0	0
Tumor site	Supratentorial	78	47.9
	Infratentorial	14	8.6
	Overlapping	71	43.6
	Brain, NOS	0	0
Subtype	DLBCL	162	99.4
	Non-DLBCL	1	0.6
	Lymphoma, NOS	0	0
Surgery	Biopsy	130	79.8
	STR	9	5.5
	GTR	24	14.7
	Partial lobectomy	0	0
	Lobectomy	0	0
	Unknown-type	0	0
Radiation	No	107	65.6
	Yes	56	34.4
Chemotherapy	No	46	28.2
	Yes	117	71.8
Coexistence with other malignancy	No	160	98.2
	Yes	3	1.8
HIV	Negative	163	100.0
	Positive	0	0

NOS, not otherwise specified; DLBCL, diffuse large B-cell lymphoma; STR, subtotal resection; GTR, gross total resection; HIV, human immunodeficiency virus.
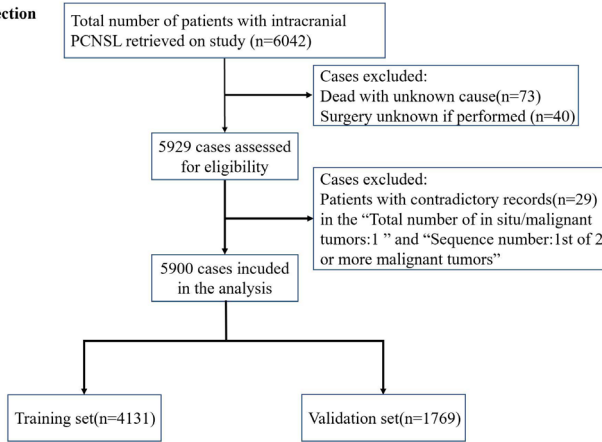
Figure S1 Flow diagram of the patient selection process. PCNSL, primary central nervous system lymphoma.
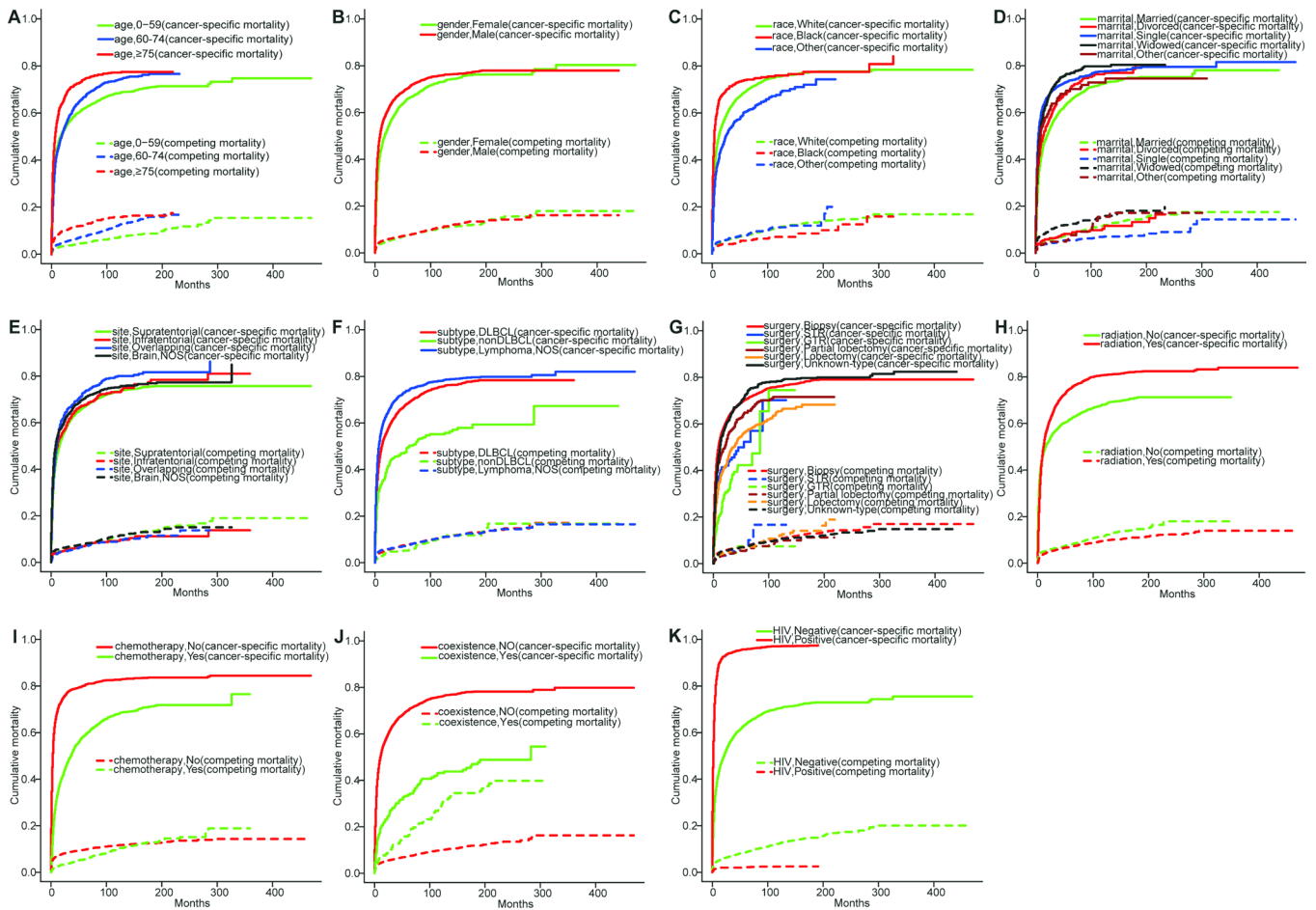

Figure S2 Cumulative incidence function (CIF) curves stratified by age (A), gender (B), race (C), marital status (D), tumor site (E), tumor subtype (F), surgery (G), radiotherapy (H), chemotherapy (I), coexisting malignancies (J), and HIV status (K).
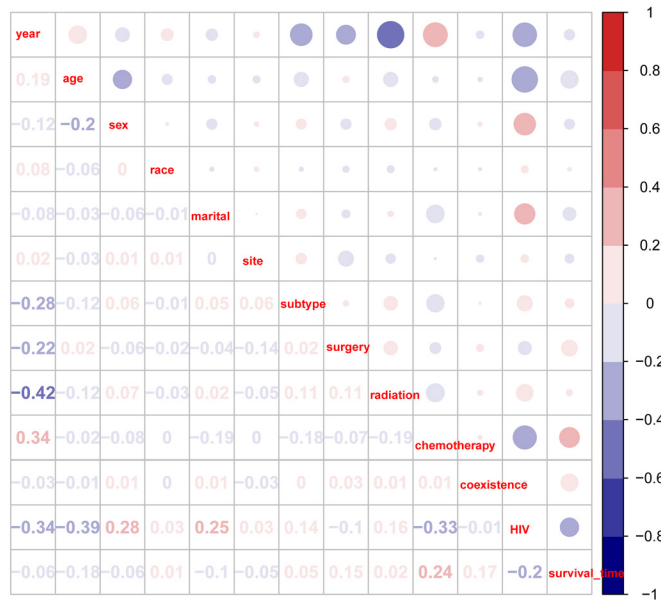
Figure S3 Correlation analysis of factors including year, age, gender, race, marital status, tumor site, tumor subtype, radiotherapy, chemotherapy, surgery, coexisting malignancies, HIV status, and survival time.
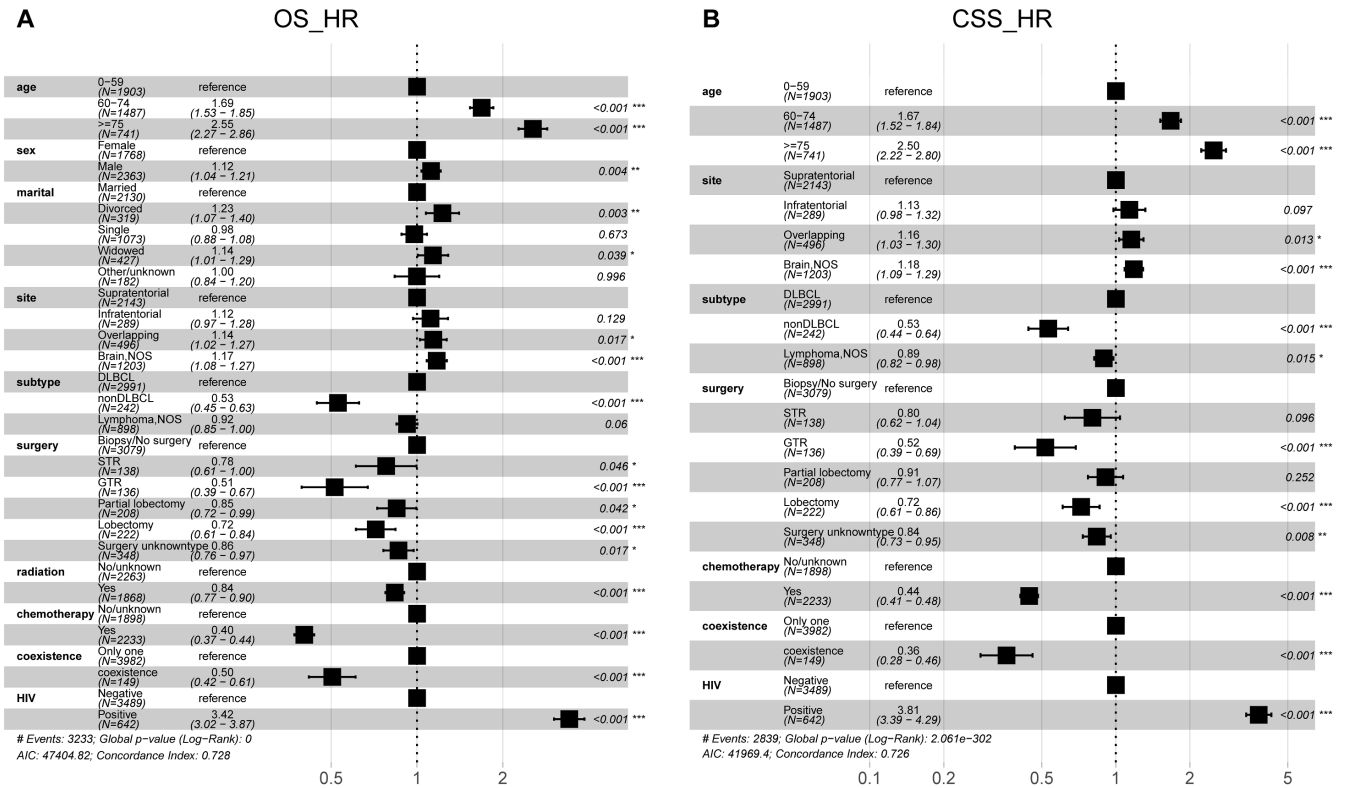

Figure S4 Forest plots showing hazard ratios (HRs) of the prognostic factors of the overall survival (OS) (A) and cancer-specific survival (CSS) (B) models in the training set.

A Individualized Survival Prediction of Primary Central Nervous System Lymphoma

Overall Survival

Age: 0-59

Gender: ● Female ○ Male

Marital status: Married

Tumor site: Supratentorial

Pathological subtype: DLBCL

Surgery: Biopsy

Radiation: ● NO ○ Yes

Chemotherapy: ● NO ○ Yes

Have other malignancy: ● NO ○ Yes

HIV infection: ● Negative ○ Positive

[Submit]

Estimated Years	Survival probability
<1-year	0.91
1-year	0.814
2-year	0.734
3-year	0.677
4-year	0.624
5-year	0.586
6-year	0.554
7-year	0.531
8-year	0.507
9-year	0.486
10-year	0.471
15-year	0.404
20-year	0.364
25-year	0.325
30-year	0.294
35-year	0.274
40-year	0.248

paper title: Nomograms for Predicting Cancer-Specific Survival for Patients With Primary Central Nervous System Lymphoma: A Population-Based Analysis
For more information, please contact: Chuanwei Yang (yangcw08@126.com)

B Individualized Survival Prediction of Primary Central Nervous System Lymphoma

Cancer-Specific Survival

Age: 0-59

Tumor site: Supratentorial

Pathological subtype: DLBCL

Surgery: Biopsy

Chemotherapy: ● NO ○ Yes

Have other malignancy: ● NO ○ Yes

HIV infection: ● Negative ○ Positive

[Submit]

Estimated Years	Survival probability
<1-year	0.919
1-year	0.831
2-year	0.749
3-year	0.694
4-year	0.645
5-year	0.614
6-year	0.578
7-year	0.552
8-year	0.53
9-year	0.509
10-year	0.489
15-year	0.418
20-year	0.373
25-year	0.339
30-year	0.296
35-year	0.264
40-year	0.239

paper title: Nomograms for Predicting Cancer-Specific Survival for Patients With Primary Central Nervous System Lymphoma: A Population-Based Analysis
For more information, please contact: Chuanwei Yang (yangcw08@126.com)

Figure S5 Free software for individualized prediction of overall survival (OS) (A) and cancer-specific survival (CSS) (B) in patients with PCNSL. OS, overall survival; CSS, cancer-specific survival; PCNSL, primary central nervous system lymphoma.
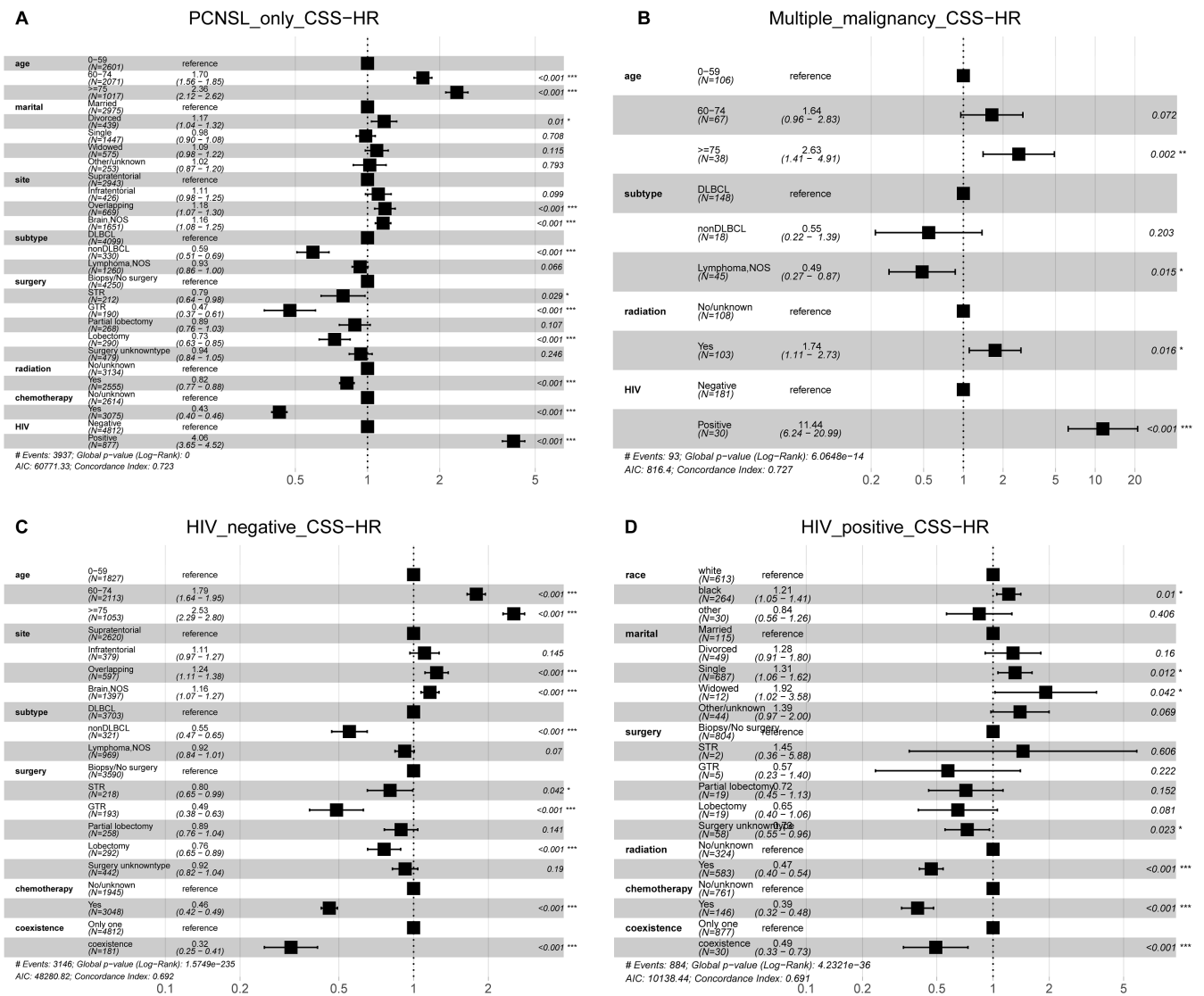
Figure S6 Subgroup analysis of the overall survival (OS) and cancer-specific survival (CSS) in the primary central nervous system lymphoma (PCNSL) patient cohort with or without HIV infection or coexisting malignancies. Forest plots showing hazard ratio (HR) of the prognostic factors of the CSS models in the subgroup of patients with PCNSL only (A), in the subgroup of patients with multiple malignancies (B), in the subgroup of patients who were HIV negative (C), and in the subgroup of patients who were HIV positive (D).