

Table 1. Proposed WHO-based nested classification of malignant lymphoid neoplasms for epidemiologic research

WHO categories	ICD-O-3 codes	ICD-O-2 codes*	Hierarchical group					
			1	2	3	4	5	6
Classical Hodgkin lymphoma, lymphocyte-rich	9651	9657, 9658	LN	HL	HL-C	HL-C-LR/MC/LD	HL-C-LR	-
Classical Hodgkin lymphoma, mixed cellularity	9652	9652	LN	HL	HL-C	HL-C-LR/MC/LD	HL-C-MC	-
Classical Hodgkin lymphoma, lymphocyte-depleted	9653-9655	9653-9655	LN	HL	HL-C	HL-C-LR/MC/LD	HL-C-LD	-
Classical Hodgkin lymphoma, nodular sclerosis	9663-9667	9663-9667	LN	HL	HL-C	HL-C-NS	-	-
Classical Hodgkin lymphoma, NOS	9650, 9661, 9662	9650, 9661, 9662	LN	HL	HL-C	-	-	-
Nodular lymphocyte predominant Hodgkin lymphoma	9659	9659, 9660	LN	HL	HL-NLP	-	-	-
Precursor lymphoblastic leukemia/lymphoma, B-cell	9727(B), 9728, 9835(B), 9836	9685(B), 9821(B), 9828(B)	LN	NHL	B-NHL	Precursor	Precursor B-NHL	-
Small lymphocytic lymphoma	9670	9670	LN	NHL	B-NHL	Mature B-NHL	CLL/SLL/PLL/MCL	CLL/SLL
Chronic lymphocytic leukemia	9823	9823	LN	NHL	B-NHL	Mature B-NHL	CLL/SLL/PLL/MCL	CLL/SLL
Prolymphocytic leukemia, B-cell	9833, 9832(B)	9825(B)	LN	NHL	B-NHL	Mature B-NHL	CLL/SLL/PLL/MCL	B-PLL
Mantle cell lymphoma	9673	9673, 9674, 9677	LN	NHL	B-NHL	Mature B-NHL	CLL/SLL/PLL/MCL	MCL
Lymphoplasmacytic lymphoma†	9671	9671	LN	NHL	B-NHL	Mature B-NHL	LPL/Waldenstrom	LPL
Waldenstrom macroglobulinemia†	9761	9761	LN	NHL	B-NHL	Mature B-NHL	LPL/Waldenstrom	Waldenstrom
Diffuse large B-cell lymphoma, NOS	9680 (excl. site C49.9), 9684(B)	9680-9683(excl. site C49.9), 9684(B), 9712, 9688§	LN	NHL	B-NHL	Mature B-NHL	DLBCL	DLBCL, NOS
Intravascular large B-cell lymphoma	9680 (site C49.9)	9680 (site C49.9)	LN	NHL	B-NHL	Mature B-NHL	DLBCL	Intravascular
Primary effusion lymphoma	9678	9678	LN	NHL	B-NHL	Mature B-NHL	DLBCL	PEL
Mediastinal large B-cell lymphoma	9679	9679	LN	NHL	B-NHL	Mature B-NHL	DLBCL	MLBCL
Burkitt lymphoma/leukemia	9687, 9826	9687, 9826	LN	NHL	B-NHL	Mature B-NHL	BL	-
Splenic marginal zone lymphoma	9689	9689	LN	NHL	B-NHL	Mature B-NHL	MZL	SMZL
Extranodal marginal zone lymphoma, MALT type	9699 (excl. site C77.0-77.9), 9760, 9764	9710, 9711, 9715 (excl. site C77.0-77.9); 9760, 9764	LN	NHL	B-NHL	Mature B-NHL	MZL	EMZL, MALT
Nodal marginal zone lymphoma	9699 (site C77.0-77.9)	9710, 9711, 9715 (site C77.0-77.9)	LN	NHL	B-NHL	Mature B-NHL	MZL	NMZL
Follicular lymphoma	9690, 9691, 9695, 9698	9690-9693, 9695-9698	LN	NHL	B-NHL	Mature B-NHL	FL	-
Hairy cell leukemia	9940	9940, 9941	LN	NHL	B-NHL	Mature B-NHL	HCL	-
Plasmacytoma	9731, 9734	9731	LN	NHL	B-NHL	Mature B-NHL	PCN	Plasmacytoma
Multiple myeloma/plasma cell leukemia	9732, 9733	9732, 9830	LN	NHL	B-NHL	Mature B-NHL	PCN	MM
Heavy chain disease‡	9762	9762, 9763	LN	NHL	B-NHL	Mature B-NHL	-	-
NHL, NOS, B-cell	9591(B), 9675(B)	9591-9593(B), 9595(B), 9672(B), 9675(B), 9676(B), 9686(B), 9694(B)	LN	NHL	B-NHL	-	-	-
Precursor lymphoblastic leukemia/lymphoma, T-cell	9727(T), 9729, 9835(T), 9837	9685(T), 9821(T), 9828(T)	LN	NHL	T-NHL	Precursor	Precursor T-NHL	-
Mycosis fungoides	9700	9700	LN	NHL	T-NHL	Mature T-NHL	MF/SS	MF
Sézary syndrome	9701	9701	LN	NHL	T-NHL	Mature T-NHL	MF/SS	SS
Peripheral T-cell lymphoma, NOS	9702, 9675(T)	9702, 9703, 9704, 9706, 9707, 9675(T), 9676(T)	LN	NHL	T-NHL	Mature T-NHL	PTCL	PTCL, NOS
Angioimmunoblastic T-cell lymphoma	9705	9705	LN	NHL	T-NHL	Mature T-NHL	PTCL	Angioimmunoblastic
Subcutaneous panniculitis-like T-cell lymphoma	9708	9708	LN	NHL	T-NHL	Mature T-NHL	PTCL	Subcutaneous panniculitis
Anaplastic large cell lymphoma, T-cell or null-cell type	9714	9714	LN	NHL	T-NHL	Mature T-NHL	PTCL	Anaplastic large cell
Hepatosplenic T-cell lymphoma	9716	9716	LN	NHL	T-NHL	Mature T-NHL	PTCL	Hepatosplenic
Enteropathy-type T-cell lymphoma	9717	9717	LN	NHL	T-NHL	Mature T-NHL	PTCL	Enteropathy
Cutaneous T-cell lymphoma, NOS	9709	9709	LN	NHL	T-NHL	Mature T-NHL	PTCL	Cutaneous T, NOS
Primary cutaneous anaplastic large cell lymphoma	9718	9718	LN	NHL	T-NHL	Mature T-NHL	PTCL	Primary cutaneous anaplastic
Adult T-cell leukemia/lymphoma	9827	9827	LN	NHL	T-NHL	Mature T-NHL	ATLL	-
NK/T-cell lymphoma, nasal-type/aggressive NK-cell leukemia	9719, 9948	9713	LN	NHL	T-NHL	Mature T-NHL	NK/T-cell lymphoma	-
T-cell large granular lymphocytic leukemia	9831	9831	LN	NHL	T-NHL	Mature T-NHL	Large granular lymphocytic leukemia	-
Prolymphocytic leukemia, T-cell	9834, 9832(T)	9825(T)	LN	NHL	T-NHL	Mature T-NHL	T-PLL	-
NHL, NOS, T-cell	9591(T), 9684(T)	9591-9593(T), 9595(T), 9672(T), 9684(T), 9686(T), 9694(T)	LN	NHL	T-NHL	-	-	-
Precursor lymphoblastic leukemia/lymphoma, unknown lineage	9727(U), 9835(U)	9685(U), 9821(U), 9828(U)	LN	NHL	-	Precursor	-	-
Prolymphocytic leukemia, unknown lineage	9832(U)	9825(U)	LN	NHL	-	-	-	-
NHL, NOS, unknown lineage	9591(U), 9675(U), 9684(U)	9591-9593(U), 9595(U), 9672(U), 9675(U), 9676(U), 9686(U), 9694(U)	LN	NHL	-	-	-	-
Composite Hodgkin/NHL, B-cell	9596(B)	9596(B)	LN	HL/NHL	-	-	-	-
Composite Hodgkin/NHL, T-cell	9596(T)	9596(T)	LN	HL/NHL	-	-	-	-
Composite Hodgkin/NHL, unknown lineage	9596(U)	9596(U)	LN	HL/NHL	-	-	-	-
Lymphoid neoplasm, NOS, B-cell	9590(B), 9594(B), 9820(B), 9970(B)	9590(B), 9594(B), 9820(B), 9822(B), 9824(B), 9850(B)	LN	-	-	-	-	-
Lymphoid neoplasm, NOS, T-cell	9590(T), 9594(T), 9820(T), 9970(T)	9590(T), 9594(T), 9820(T), 9822(T), 9824(T), 9850(T)	LN	-	-	-	-	-
Lymphoid neoplasm, NOS, unknown lineage	9590(U), 9594(U), 9820(U), 9970(U)	9590(U), 9594(U), 9820(U), 9822(U), 9824(U), 9850(U)	LN	-	-	-	-	-

Abbreviations: adult T-cell leukemia/lymphoma (ATLL); Burkitt lymphoma/leukemia (BL); B-cell non-Hodgkin lymphoma (B-NHL); chronic lymphocytic leukemia (CLL); diffuse large B-cell lymphoma (DLBCL); extranodal marginal zone lymphoma (EMZL); follicular lymphoma (FL); hairy cell leukemia (HCL); Hodgkin lymphoma (HL); composite Hodgkin/non-Hodgkin lymphoma (HL/NHL); classical Hodgkin lymphoma (HL-C); classical Hodgkin lymphoma, lymphocyte-depleted (HL-C-LD); classical Hodgkin lymphoma, lymphocyte-rich (HL-C-LR); classical Hodgkin lymphoma, mixed cellularity (HL-C-MC); classical Hodgkin lymphoma, nodular sclerosis (HL-C-NS); International Classification of Diseases for Oncology (ICD-O); nodular lymphocyte predominant Hodgkin lymphoma (HL-NLP); lymphoid neoplasm (LN); lymphoplasmacytic lymphoma (LPL); extranodal marginal zone lymphoma of mucosa-associated lymphoid tissue (MALT); mantle cell lymphoma (MCL); mycosis fungoides (MF); mediastinal large B-cell lymphoma (MLBCL); multiple myeloma (MM); marginal zone lymphoma (MZL); non-Hodgkin lymphoma (NHL); natural killer cell (NK); nodal marginal zone lymphoma (NMZL); not otherwise specified (NOS); plasma cell neoplasm (PCN); primary effusion lymphoma (PEL); prolymphocytic leukemia (PLL); peripheral T-cell lymphoma (PTCL); small lymphocytic lymphoma (SLL); splenic marginal zone lymphoma (SMZL); Sézary syndrome (SS); Surveillance, Epidemiology, and End Results (SEER); World Health Organization (WHO).

Notes: Cases of composite lymphoma with more than one type of NHL should be classified according to the low-grade component. Codes followed by parentheses indicate that immunophenotyping data (B-cell, T-/NK-cell, or unknown) should be used to assign cases to that lymphoid neoplasm subtype. Tables organized by ICD-O-2 and ICD-O-3 code are available from the author.

- = Category cannot be assigned.

* Conversion from ICD-O-2 is more valid for cases diagnosed after 1995, when additional ICD-O-2 codes for marginal zone lymphomas were added, than for cases diagnosed before 1995. ICD-O-1 codes can be converted to ICD-O-2 using a SEER conversion algorithm (33).

† Lymphoplasmacytic lymphoma and Waldenstrom macroglobulinemia are recognized as a single entity in the WHO classification; however, Waldenstrom macroglobulinemia may occur with other B-cell types and should be grouped as such when possible.

‡ Heavy chain diseases share a single ICD-O-3 code, but the WHO classification considers gamma heavy chain disease (associated with lymphoplasmacytic lymphoma), mu heavy chain disease (associated with CLL), and alpha heavy chain disease (associated with EMZL, MALT) to be distinct.

§ Such cases should be grouped with specific histological types when possible.

§ ICD-O-2 codes 9680-9683(excl. site C49.9), 9684(B), 9712, and 9688 can be categorized as DLBCL in hierarchical group 5, but should be excluded from analyses in hierarchical group 6.

Table 2. Incidence of lymphoid neoplasm subtypes as defined by the proposed nested classification, 17 SEER registries, 2001-2003

Lymphoid neoplasms	No. cases	Rate*	% of total	% of HL	% of NHL
Lymphoid neoplasms, total	71,762	33.42			
Hodgkin lymphoma	6,103	2.71	8.5		
Classical Hodgkin lymphoma	5,900	2.62	8.2	96.7	
Classical Hodgkin lymphoma, lymphocyte-rich/mixed cellularity/lymphocyte-depleted	1,097	0.50	1.5	18.0	
Classical Hodgkin lymphoma, lymphocyte-rich	171	0.08	0.2	2.8	
Classical Hodgkin lymphoma, mixed cellularity	858	0.39	1.2	14.1	
Classical Hodgkin lymphoma, lymphocyte-depleted	68	0.03	0.1	1.1	
Classical Hodgkin lymphoma, nodular sclerosis	3,806	1.67	5.3	62.4	
Classical Hodgkin lymphoma, NOS	997	0.45	1.4	16.3	
Nodular lymphocyte predominant Hodgkin lymphoma	203	0.09	0.3	3.3	
NHL	62,982	29.46	87.8		
NHL, B-cell†	56,907	26.68	79.3		90.4
Mature NHL, B-cell	52,208	24.53	72.8		82.9
CLL/SLL/PLL/MCL	12,200	5.78	17.0		19.4
CLL/SLL	10,751	5.10	15.0		17.1
Prolymphocytic leukemia, B-cell	57	0.03	0.1		0.1
Mantle cell lymphoma	1,392	0.66	1.9		2.2
LPL/Waldenström	1,333	0.63	1.9		2.1
Lymphoplasmacytic lymphoma	595	0.28	0.8		0.9
Waldenström macroglobulinemia	738	0.35	1.0		1.2
Diffuse large B-cell lymphoma	14,543	6.80	20.3		23.1
Diffuse large B-cell lymphoma, NOS	14,474	6.77	20.2		23.0
Intravascular large B-cell lymphoma	15	0.01	0.0		0.0
Primary effusion lymphoma	10	0.00	0.0		0.0
Mediastinal large B-cell lymphoma	44	0.02	0.1		0.1
Burkitt lymphoma/leukemia	863	0.39	1.2		1.4
Marginal zone lymphoma	3,563	1.67	5.0		5.7
Splenic marginal zone lymphoma	230	0.11	0.3		0.4
Extranodal marginal zone lymphoma, MALT type	2,371	1.11	3.3		3.8
Nodal marginal zone lymphoma	962	0.45	1.3		1.5
Follicular lymphoma	7,543	3.51	10.5		12.0
Hairy cell leukemia	645	0.30	0.9		1.0
Plasma cell neoplasms	11,510	5.45	16.0		18.3
Plasmacytoma	785	0.37	1.1		1.2
Multiple myeloma/plasma cell leukemia	10,725	5.08	14.9		17.0
Heavy chain disease	8	~	~		~
NHL, NOS, B-cell	2,351	1.11	3.3		3.7
NHL, T-cell†	4,286	1.96	6.0		6.8
Mature NHL, T-cell	3,645	1.68	5.1		5.8
Mycosis fungoides/Sézary syndrome	957	0.44	1.3		1.5
Mycosis fungoides	934	0.43	1.3		1.5
Sézary syndrome	23	0.01	0.0		0.0
Peripheral T-cell lymphoma	2,405	1.11	3.4		3.8
Peripheral T-cell lymphoma, NOS	857	0.40	1.2		1.4
Angioimmunoblastic T-cell lymphoma	177	0.08	0.2		0.3
Subcutaneous panniculitis-like T-cell lymphoma	20	0.01	0.0		0.0
Anaplastic large cell lymphoma, T-cell or null-cell type	629	0.29	0.9		1.0
Hepatosplenic T-cell lymphoma	13	0.01	0.0		0.0
Enteropathy-type T-cell lymphoma	18	0.01	0.0		0.0
Cutaneous T-cell lymphoma, NOS	501	0.23	0.7		0.8
Primary cutaneous anaplastic large cell lymphoma	190	0.09	0.3		0.3
Adult T-cell leukemia/lymphoma	79	0.04	0.1		0.1
NK/T-cell lymphoma, nasal-type/aggressive NK-cell leukemia	130	0.06	0.2		0.2
T-cell large granular lymphocytic leukemia	25	0.01	0.0		0.0
Prolymphocytic leukemia, T-cell	49	0.02	0.1		0.1
NHL, NOS, T-cell	55	0.03	0.1		0.1
Precursor NHL	3,805	1.68	5.3		6.0
Precursor lymphoblastic leukemia/lymphoma, B-cell	2,348	1.04	3.3		3.7
Precursor lymphoblastic leukemia/lymphoma, T-cell	586	0.26	0.8		0.9
Precursor lymphoblastic leukemia/lymphoma, unknown lineage	871	0.39	1.2		1.4
NHL, unknown lineage†	1,789	0.82	2.5		2.8
Prolymphocytic leukemia, unknown lineage	40	0.02	0.1		0.1
NHL, NOS, unknown lineage	878	0.41	1.2		1.4
Composite Hodgkin/NHL	35	0.02	0.0		
Composite Hodgkin/NHL, B-cell	19	0.01	0.0		
Composite Hodgkin/NHL, T-cell	1	~	~		
Composite Hodgkin/NHL, unknown lineage	15	0.01	0.0		
Lymphoid neoplasm, NOS, B-cell	631	0.30	0.9		
Lymphoid neoplasm, NOS, T-cell	104	0.05	0.1		
Lymphoid neoplasm, NOS, unknown lineage	1,907	0.89	2.7		

Abbreviations: adult T-cell leukemia/lymphoma (ATLL); Burkitt lymphoma/leukemia (BL); B-cell non-Hodgkin lymphoma (B-NHL); chronic lymphocytic leukemia (CLL); diffuse large B-cell lymphoma (DLBCL); extranodal marginal zone lymphoma (EMZL); follicular lymphoma (FL); hairy cell leukemia (HCL); Hodgkin lymphoma (HL); composite Hodgkin/non-Hodgkin lymphoma (HL/NHL); classical Hodgkin lymphoma (HL-C); classical Hodgkin lymphoma, lymphocyte-depleted (HL-C-LD); classical Hodgkin lymphoma, lymphocyte-rich (HL-C-LR); classical Hodgkin lymphoma, mixed cellularity (HL-C-MC); classical Hodgkin lymphoma, nodular sclerosis (HL-C-NS); International Classification of Diseases for Oncology (ICD-O); nodular lymphocyte predominant Hodgkin lymphoma (HL-NLP); lymphoid neoplasm (LN); lymphoplasmacytic lymphoma (LPL); extranodal marginal zone lymphoma of mucosa-associated lymphoid tissue (MALT); mantle cell lymphoma (MCL); mycosis fungoides (MF); mediastinal large B-cell lymphoma (MLBCL); multiple myeloma (MM); marginal zone lymphoma (MZL); non-Hodgkin lymphoma (NHL); natural killer cell (NK); nodal marginal zone lymphoma (NMZL); not otherwise specified (NOS); plasma cell neoplasm (PCN); primary effusion lymphoma (PEL); prolymphocytic leukemia (PLL); peripheral T-cell lymphoma (PTCL); small lymphocytic lymphoma (SLL); splenic marginal zone lymphoma (SMZL); Sézary syndrome (SS); Surveillance, Epidemiology, and End Results (SEER); World Health Organization (WHO).

~ Statistic was not calculated when fewer than ten cases occurred.

* Incidence rates were age adjusted to the 2000 US population and are expressed per 100,000 person-years.

† Includes both mature and precursor neoplasms.

Table 3. Incorporation of lymphoid neoplasm subtypes defined by the REAL classification into the proposed WHO-based nested classification of malignant lymphoid neoplasms

REAL classification categories	Hierarchical group					
	1	2	3	4	5	6
B-cell neoplasms						
I. Precursor B-cell neoplasm: precursor B-lymphoblastic leukemia/lymphoma	LN	NHL	B-NHL	Precursor	Precursor B-NHL	-
II. Peripheral B-cell neoplasms						
A. B-cell chronic lymphocytic leukemia/prolymphocytic leukemia/small lymphocytic lymphoma	LN	NHL	B-NHL	Mature B-NHL	CLL/SLL/PLL/MCL	CLL/SLL
B. Lymphoplasmacytoid lymphoma/immunocytoma	LN	NHL	B-NHL	Mature B-NHL	LPL/Waldenstrom	LPL
C. Mantle cell lymphoma	LN	NHL	B-NHL	Mature B-NHL	CLL/SLL/PLL/MCL	MCL
D. Follicle center cell lymphoma, follicular	LN	NHL	B-NHL	Mature B-NHL	FL	-
E. Marginal zone B-cell lymphoma						
1. Extranodal (MALT-type)	LN	NHL	B-NHL	Mature B-NHL	MZL	EMZL, MALT
2. Provisional subtype: nodal	LN	NHL	B-NHL	Mature B-NHL	MZL	NMZL
F. Provisional entity: splenic marginal zone lymphoma	LN	NHL	B-NHL	Mature B-NHL	MZL	SMZL
G. Hairy cell leukemia	LN	NHL	B-NHL	Mature B-NHL	HCL	-
H. Plasmacytoma/plasma cell myeloma	LN	NHL	B-NHL	Mature B-NHL	PCN	-
I. Diffuse large B-cell lymphoma	LN	NHL	B-NHL	Mature B-NHL	DLBCL	DLBCL
1. Subtype: primary mediastinal (thymic) B-cell lymphoma	LN	NHL	B-NHL	Mature B-NHL	DLBCL	MLBCL
J. Burkitt's lymphoma	LN	NHL	B-NHL	Mature B-NHL	BL	-
K. Provisional entity: high-grade B-cell lymphoma, Burkitt-like*	LN	NHL	B-NHL	Mature B-NHL	BL	-
T-cell and putative NK-cell neoplasms						
I. Precursor T-cell neoplasm: precursor T-lymphoblastic lymphoma/leukemia	LN	NHL	T-NHL	Precursor	Precursor T-NHL	-
II. Peripheral T-cell and NK-cell neoplasms						
A. T-cell chronic lymphocytic leukemia / prolymphocytic leukemia	LN	NHL	T-NHL	Mature T-NHL	T-PLL	-
B. Large granular lymphocyte leukemia						
1. T-cell type	LN	NHL	T-NHL	Mature T-NHL	T-LGL	-
2. NK-cell type	LN	NHL	T-NHL	Mature T-NHL	-	-
C. Mycosis fungoides/Sézary's syndrome	LN	NHL	T-NHL	Mature T-NHL	MF/SS	-
D. Peripheral T-cell lymphomas, unspecified						
1. Combine all provisional cytologic categories (medium-sized cell, mixed medium and large large cell, large cell, lymphoepithelioid cell)	LN	NHL	T-NHL	Mature T-NHL	PTCL	PTCL, NOS
2. Provisional subtype: hepatosplenic gamma/delta T-cell lymphoma	LN	NHL	T-NHL	Mature T-NHL	PTCL	Hepatosplenic
3. Provisional subtype: subcutaneous panniculitic T-cell lymphoma	LN	NHL	T-NHL	Mature T-NHL	PTCL	Subcutaneous panniculitis
E. Angioimmunoblastic T-cell lymphoma	LN	NHL	T-NHL	Mature T-NHL	PTCL	Angioimmunoblastic
F. Angiocentric lymphoma	LN	NHL	T-NHL	Mature T-NHL	NK/T-cell lymphoma	-
G. Intestinal T-cell lymphoma (+/- enteropathy associated)	LN	NHL	T-NHL	Mature T-NHL	PTCL	Enteropathy
H. Adult T-cell lymphoma/leukemia	LN	NHL	T-NHL	Mature T-NHL	ATLL	-
I. Anaplastic large cell lymphoma						
1. Primary cutaneous (CD30+) type	LN	NHL	T-NHL	Mature T-NHL	PTCL	Primary cutaneous anaplastic
2. T-cell type	LN	NHL	T-NHL	Mature T-NHL	PTCL	Anaplastic large cell
3. Null-cell type	LN	NHL	T-NHL	Mature T-NHL	PTCL	Anaplastic large cell
J. Provisional entity: anaplastic large cell lymphoma, Hodgkin's-like	LN	-	-	-	-	-
Hodgkin's Disease						
I. Lymphocyte predominance	LN	HL	HL-NLP	-	-	-
II. Nodular sclerosis	LN	HL	HL-C	HL-C-NS	-	-
III. Mixed cellularity	LN	HL	HL-C	HL-C-LR/MC/LD	HL-C-MC	-
IV. Lymphocyte depletion	LN	HL	HL-C	HL-C-LR/MC/LD	HL-C-LD	-
V. Provisional entity: lymphocyte-rich classical Hodgkin's disease	LN	HL	HL-C	HL-C-LR/MC/LD	HL-C-LR	-

Abbreviations: adult T-cell leukemia/lymphoma (ATLL); Burkitt lymphoma/leukemia (BL); B-cell non-Hodgkin lymphoma (B-NHL); chronic lymphocytic leukemia (CLL); diffuse large B-cell lymphoma (DLBCL); extranodal marginal zone lymphoma (HCL); Hodgkin lymphoma (HL); composite Hodgkin/non-Hodgkin lymphoma (HL/NHL); classical Hodgkin lymphoma (HL-C); classical Hodgkin lymphoma, lymphocyte-depleted (HL-C-LD); classical Hodgkin lymphoma, lymphocyte-rich (HL-C-LR); classical Hodgkin lymphoma, mixed cellularity (HL-C-MC); classical Hodgkin lymphoma, nodular sclerosis (HL-C-NS); International Classification of Diseases for Oncology (ICD-O); nodular lymphocyte predominant Hodgkin lymphoma (HL-NLP); lymphoid neoplasm (LN); lymphoplasmacytic lymphoma (LPL); extranodal marginal zone lymphoma of mucosa-associated lymphoid tissue (MALT); mantle cell lymphoma (MCL); mycosis fungoides (MF); mediastinal large B cell lymphoma (MLBCL); multiple myeloma (MM); marginal zone lymphoma (MZL); non-Hodgkin lymphoma (NHL); natural killer cell (NK); nodal marginal zone lymphoma (NMZL); not otherwise specified (NOS); plasma cell neoplasm (PCN); primary effusion lymphoma (PEL); prolymphocytic leukemia (PLL); peripheral T-cell lymphoma (PTCL); small lymphocytic lymphoma (SLL); splenic marginal zone lymphoma (SMZL); Sézary syndrome (SS); Surveillance, Epidemiology, and End Results (SEER); World Health Organization (WHO).

- = Category cannot be assigned.

* High-grade B-cell lymphoma, Burkitt-like should be coded as Burkitt lymphoma only if the growth fraction is nearly 100%, CD10+, Bcl2-, and proven or strong presumptive evidence of MYC translocation; otherwise code to DLBCL. Without these data, cases of high-grade B-cell lymphoma, Burkitt-like cannot be classified beyond mature B-NHL.

Table 4. Incorporation of lymphoid neoplasm subtypes defined by the Working Formulation into the proposed WHO-based nested classification of malignant lymphoid neoplasms, without immunophenotype data*

Working Formulation categories	Hierarchical group					
	1	2	3	4	5	6
A. Small lymphocytic	LN	NHL	B-NHL	Mature B-NHL	-	-
B. Follicular, small cleaved cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
C. Follicular, mixed small cleaved and large cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
D. Follicular, large cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
E. Diffuse, small cleaved cell	LN	NHL	B-NHL	Mature B-NHL	-	-
F. Diffuse, mixed small and large cell	LN	NHL	-	-	-	-
G. Diffuse, large cell	LN	NHL	B-NHL	Mature B-NHL	DLBCL	-
H. Large cell, immunoblastic	LN	NHL	-	-	-	-
I. Lymphoblastic	LN	NHL	-	Precursor	-	-
J. Small non-cleaved cell	LN	NHL	B-NHL	Mature B-NHL	-	-
K. Unclassified	LN	NHL	-	-	-	-

Abbreviations: Burkitt lymphoma/leukemia (BL); diffuse large B-cell lymphoma (DLBCL); follicular lymphoma (FL); non-Hodgkin lymphoma (NHL); World Health Organization (WHO).

- = Category cannot be assigned.

* Without immunophenotype data, this translation is appropriate for predominantly Caucasian populations only.

Table 5. Incorporation of lymphoid neoplasm subtypes defined by the Working Formulation into the proposed WHO-based nested classification of malignant lymphoid neoplasms, with basic immunophenotype data (i.e., B-cell versus T-cell)

Working Formulation categories	Hierarchical group					
	1	2	3	4	5	6
A. Small lymphocytic, B-cell	LN	NHL	B-NHL	Mature B-NHL	-	-
A. Small lymphocytic, T-cell	LN	NHL	T-NHL	Mature T-NHL	-	-
A. Small lymphocytic, unknown cell	LN	NHL	-	-	-	-
B. Follicular, small cleaved cell, B-cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
B. Follicular, small cleaved cell, unknown cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
C. Follicular, mixed small cleaved and large cell, B-cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
C. Follicular, mixed small cleaved and large cell, unknown cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
D. Follicular, large cell, B-cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
D. Follicular, large cell, unknown cell	LN	NHL	B-NHL	Mature B-NHL	FL	-
E. Diffuse, small cleaved cell, B-cell	LN	NHL	B-NHL	Mature B-NHL	-	-
E. Diffuse, small cleaved cell, T-cell	LN	NHL	T-NHL	Mature T-NHL	-	-
E. Diffuse, small cleaved cell, unknown cell	LN	NHL	-	-	-	-
F. Diffuse, mixed small and large cell, B-cell	LN	NHL	B-NHL	Mature B-NHL	-	-
F. Diffuse, mixed small and large cell, T-cell	LN	NHL	T-NHL	Mature T-NHL	PTCL	-
F. Diffuse, mixed small and large cell, unknown cell	LN	NHL	-	-	-	-
G. Diffuse, large cell, B-cell	LN	NHL	B-NHL	Mature B-NHL	DLBCL	-
G. Diffuse, large cell, T-cell	LN	NHL	T-NHL	Mature T-NHL	PTCL	-
G. Diffuse, large cell, unknown cell	LN	NHL	-	-	-	-
H. Large cell, immunoblastic, B-cell	LN	NHL	B-NHL	Mature B-NHL	DLBCL	-
H. Large cell, immunoblastic, T-cell	LN	NHL	T-NHL	Mature T-NHL	PTCL	-
H. Large cell, immunoblastic, unknown cell	LN	NHL	-	-	-	-
I. Lymphoblastic, B-cell	LN	NHL	-	Precursor	Precursor B-NHL	-
I. Lymphoblastic, T-cell	LN	NHL	-	Precursor	Precursor T-NHL	-
I. Lymphoblastic, unknown cell	LN	NHL	-	Precursor	-	-
J. Small non-cleaved cell, B-cell*	LN	NHL	B-NHL	Mature B-NHL	BL	-
J. Small non-cleaved cell, T-cell	LN	NHL	T-NHL	Mature T-NHL	PTCL	-
J. Small non-cleaved cell, unknown cell	LN	NHL	-	-	-	-
K. Unclassified, B-cell	LN	NHL	B-NHL	-	-	-
K. Unclassified, T-cell	LN	NHL	T-NHL	-	-	-
K. Unclassified, unknown cell	LN	NHL	-	-	-	-

Abbreviations: Burkitt lymphoma/leukemia (BL); diffuse large B-cell lymphoma (DLBCL); follicular lymphoma (FL); non-Hodgkin lymphoma (NHL); peripheral T-cell lymphoma (PTCL); World Health Organization (WHO).

- = Category cannot be assigned.

* Small non-cleaved cell lymphoma should be coded as Burkitt lymphoma only if the growth fraction is nearly 100%, CD10+, Bcl2-, and proven or strong presumptive evidence of MYC translocation; otherwise code to DLBCL. Without these data, cases of small non-cleaved cell lymphoma cannot be classified beyond mature B-NHL.

Table 6. Categorization of lymphoma subtypes according to the Working Formulation and proposed nested classification for 4685 cases from four studies

Nested classification categories	Working Formulation categories (column %)								
	A: Small lymphocytic (n=513)	B-D: Follicular lymphoma (n=1381)	E: Diffuse small cleaved cell (n=244)	F: Diffuse mixed small and large cell (n=167)	G: Diffuse large cell (n=1165)	H: Large cell Immunoblastic (n=447)	I: Lymphoblastic (n=83)	J: Small non-cleaved cell (n=159)	K: Unknown (n=526)
Precursor lymphoblastic leukemia/lymphoma, B- and T-cell	0	0	0	0	2	1	75	2	0
B-NHL	498	1341	202	84	1075	275	27	154	259
Mature B-NHL	498	1341	202	84	1073	274	6	152	259
CLL/SLL/PLL/MCL	294	65	103	6	8	0	6	1	40
LPL/Waldenstrom	70	0	1	2	0	0	0	0	4
DLBCL	1	10	4	40	1027	272	0	5	13
BL*	0	0	0	0	3	0	0	144	1
MZL	130	38	64	21	21	2	0	2	158
FL	3	1228	30	15	14	0	0	0	11
T-NHL	2	0	19	62	41	159	54	3	31
Mature T-NHL	2	0	19	62	41	159	0	3	31
MF/SS	0	0	6	0	0	0	0	0	10
PTCL	1	0	10	56	27	140	0	3	8
Unknown	13	40	23	21	49	13	2	2	236

Abbreviations: Burkitt lymphoma/leukemia (BL); B-cell non-Hodgkin lymphoma (B-NHL); chronic lymphocytic leukemia (CLL); diffuse large B-cell lymphoma (DLBCL); follicular lymphoma (FL); lymphoplasmacytic lymphoma (LPL); mantle cell lymphoma (MCL); mycosis fungoides (MF); marginal zone lymphoma (MZL); non-Hodgkin lymphoma (NHL); peripheral T-cell lymphoma (PTCL); small lymphocytic lymphoma (SLL); splenic marginal zone lymphoma (SMZL); Sézary syndrome (SS).

* BL refers to the combined categories of Burkitt lymphoma and high-grade B-cell lymphoma, Burkitt-like.