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Classification and staging of melanoma

A revised version of the internationally accepted classification and staging system for melanoma was published in 2002 by the American Joint Committee on Cancer (AJCC) and the International Union Against Cancer (UICC).^{1,2} The review was based on analysis of prognostic factors involving 17,600 patients from 13 cancer centres and organisations.

The AJCC Melanoma Staging Committee used the following guidelines to determine which criteria should be used in the tumour-node metastases (TNM) classification and the stage groupings:

- (i) The staging system must be practical, reproducible, and applicable to the diverse needs of all medical disciplines.
- (ii) The criteria must accurately reflect the biology of melanoma based on consistent outcome results of patients treated at multiple institutions from multiple countries.
- (iii) The criteria used must be evidence-based and reflect the dominant prognostic factors consistently identified in Cox multivariate regression analyses.
- (iv) The criteria must be relevant to current clinical practice and regularly incorporated in clinical trials.
- (v) The required data must be sufficiently easy for tumour registrars to identify in medical records to code staging information.

Major changes from the previous version of the AJCC/UICC melanoma classification and staging system included:

- (i) Melanoma thickness and ulceration but not level of invasion to be used in the T category (except for T1 melanomas).
- (ii) The number of metastatic lymph nodes rather than their gross dimensions and the delineation of clinically occult (i.e. microscopic) versus clinically apparent (i.e. macroscopic) nodal metastases to be used in the N category.
- (iii) The site of distant metastases and the presence of elevated serum lactic dehydrogenase to be used in the M category.
- (iv) An upstaging of all patients with stage I, II and III disease when a primary melanoma is ulcerated.
- (v) A merging of satellite metastases around a primary melanoma and in-transit metastases into a single staging entity that is grouped into stage III disease.
- (vi) A new convention for defining clinical and pathologic staging to take into account the staging information gained from intraoperative lymphatic mapping and sentinel node biopsy.

An extract from the 2002 AJCC classification and staging system is provided under section 4.1 *Extract from AJCC Cancer Staging Manual, 6th edition, 2002.*

The AJCC Melanoma Staging Committee reconvened in 2006 to begin preparation of the next version of the AJCC staging system, scheduled to become official with publication of the seventh edition of the AJCC Cancer Staging Manual which is expected to be published in late 2009 and will become operative in 2010.

Evidence summary	Level	Reference
Analysis of staging and survival data from 17,600 melanoma patients demonstrated the following results which informed the 2002 6th edition of the AJCC melanoma staging system. For primary tumours (T), the most powerful predictors of survival were thickness and ulceration. Level of invasion had a significant impact only within the subgroup of thin (< 1 mm) melanomas. Three independent factors for the classification of regional lymph nodes (N) were found to be the number of metastatic nodes, whether nodal metastases were clinically occult or clinically apparent, and the presence or absence of primary tumour ulceration. Finally, in the category of distant metastasis (M), nonvisceral metastases were associated with a better survival compared with visceral metastases. The results of this study were used to inform the 2002 edition of the AJCC/UICC melanoma staging system	II	3

Recommendation		Grade
1. That the current AJCC/UICC classification system be used for staging patients with melanoma	B	

4.1 Extract from AJCC Cancer Staging Manual, 6th edition, 2002²

Rules for classification

There should be histological confirmation of the disease. The following are the procedures for assessing T (Primary Tumour), N (Regional Lymph Nodes) and M (Distant Metastasis) categories, shown in Table 3.

Table 3 Melanoma TNM classification

T classification	Thickness	Ulceration status
TX	Primary tumour cannot be assessed	
T0	No evidence of primary tumour	
Tis	Melanoma in situ	
T1	</= 1.0mm	a: without ulceration and level II/III b: with ulceration or level IV/V
T2	1.01–2.0mm	a: without ulceration b: with ulceration
T3	2.01–4.0mm	a: without ulceration b: with ulceration
T4	> 4.0 mm	a: without ulceration b: with ulceration
N classification	No. of metastatic nodes	Nodal metastatic mass
NX	Regional lymph nodes cannot be assessed	
N0	No regional lymph node metastasis	
N1	1 node	a: clinically occult (microscopic) metastasis b: clinically apparent (macroscopic) metastasis
N2	2–3 nodes	a: clinically occult (microscopic) metastasis b: clinically apparent (macroscopic) metastasis c: in transit met(s)/satellite(s) without metastatic nodes
N3	4 or more metastatic nodes, or matted nodes, or in transit met(s)/satellite(s) with metastatic nodes	
M classification	Site	Serum lactate dehydrogenase
MX	Distant metastasis cannot be assessed	
M0	No distant metastasis	
M1a	Distant skin, subcutaneous, or nodal mets	Normal
M1b	Lung metastasis	Normal
M1c	All other visceral metastasis	Normal
	Any distant metastasis	Elevated

Table 4 Stage groupings for cutaneous melanoma

	Clinical stage grouping			Pathologic stage grouping		
	T	N	M	T	N	M
O	Tis	N0	M0	Tis	N0	M0
IA	T1a	N0	M0	T1a	N0	M0
IB	T1b	N0	M0	T1b	N0	M0
	T2a	N0	M0	T2b	N0	M0
IIA	T2b	N0	M0	T2b	N0	M0
	T3a	N0	M0	T3a	N0	M0
IIB	T3b	N0	M0	T3b	N0	M0
	T4a	N0	M0	T4a	N0	M0
IIC	T4b	N0	M0	T4b	N0	M0
III	Any T	N1	M0			
	Any T	N2	M0			
	Any T	N3	M0			
IIIA				T1–4a	N1a	M0
				T1–4a	N2a	M0
IIIB				T1–4b	N1a	M0
				T1–4b	N2a	M0
				T1–4a	N1b	M0
				T1–4a	N2b	M0
				T1–4a/b	N2c	M0
IIIC				T1–4b	N1b	M0
				T1–4b	N2b	M0
				Any T	N3	M0
IV	Any T	Any N	M1	Any T	Any N	M1

References

1. Balch CM, Buzaid AC, Soong SJ, et al. Final version of the American Joint Committee on Cancer staging system for cutaneous melanoma. *J Clin Oncol* 2001; 19(16):3635–48.
2. AJCC. American Joint Committee Cancer Staging Manual. 6th edn. 2002. New York: Springer-Verlag.
3. Balch CM, Soong SJ, Gershenwald JE, Thompson JF, Reintgen DS, et al. Prognostic factors analysis of 17,600 melanoma patients: validation of the American Joint Committee on Cancer melanoma staging system. *J Clin Oncol* 2001; 19(16):3622–3634.