TNM Classification of Malignant Tumours - 7th **edition**

Outline of changes between 6th and 7th editions

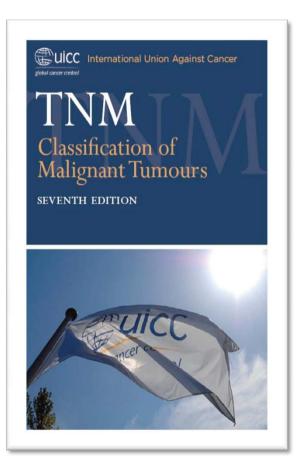




TNM 7th edition available now!

The aim of this presentation is to:

- present the changes between the 6th and 7th edition
- Indicate where no changes have taken place
- provide links to where questions on the use of TNM may be found

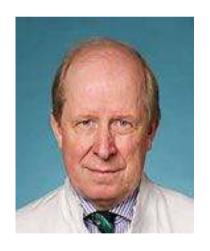




Special thanks to the editors



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Highlights

- Changes to take effect from January 2010
- The rules of classification and staging correspond to those appearing in the seventh edition of the *AJCC Cancer Staging Manual* 2009 and have approval of all national TNM committees
- First time the UICC process for evaluating proposals has been used



Highlights

- 9 new classifications
- 6 major modifications
- Elimination of MX
- Introduction of Anatomical Stage Grouping and Prognostic Grouping



First time the UICC process for evaluating proposals has been used

A continuous systematic approach composed of two arms has been introduced:

- procedures to address formal proposals from investigators
- periodic literature search for articles about improvements to TNM

Proposals and results of the literature search are evaluated by members of a UICC panel of experts, the TNM Prognostic Factors committee, the AJCC and the other national TNM experts

The changes to Lung cancer staging proposed by the IALSC and adopted are an example of this process



TNM-7 New classifications

- Melanoma of upper aerodigestive tract
- Gastroesophageal carcinomas
- Gastrointestinal stromal tumours (GISTs)
- Appendix: carcinomas
- Neuroendocrine tumours: stomach, intestines, appendix; pancreas; lung
- Intrahepatic cholangiocarcinoma
- Merkel cell carcinoma
- Uterine sarcomas
- Adrenal cortex



TNM-7 Major modifications

- Esophagus
- Stomach
- Lung
- Skin
- Vulva
- Prostate



TNM-7 Minor or no modifications

- Head and neck
- Small intestine
- Colon
- Anal canal
- Liver, hepatocellular
- Gallbladder, ampulla, pancreas
- Mesothelioma, pleural
- Skin, melanoma
- · Gynecological sites: except vulva
- Urological sites: except prostate



Elimination of MX

The use of MX may result in exclusion from staging

cMX is inappropriate as the clinical assessment of metastasis can be based on physical examination alone.

If the pathologist does not have knowledge of the clinical M, MX should NOT be recorded. It has been deleted from TNM.

pMX: does not exist; pM0: does not exist (except at autopsy)



Elimination of MX

What remains:

cM0 = clinically no distant metastasis

cM1= distant metastasis clinically, e.g., colon cancer with liver metastasis based on CT

pM1= distant metastasis proven microscopically, e.g., needle biopsy
If a cM1 (e.g., liver met) is biopsied and is negative, it becomes cM0, not pM0



Stage Grouping and Prognostic Grouping

Stage grouping:

 Anatomical extent of disease, composed of T, N, and M categories alone

Prognostic Grouping:

T, N, and M plus other prognostic factors

For most tumour sites only the (Anatomical) Stage Grouping is given



Nasopharynx – 7th edition

T1 Nasopharynx, oropharynx or nasal cavity (was T2a) without parapharyngeal extension

T2 Parapharyngeal extension (was T2b)

T3 Bony structures of skull base and/or paranasal sinuses

T4 Intracranial, cranial nerves, hypopharynx, orbit, infratemporal fossa/ masticator space

N1 Unilateral cervical, unilateral or bilateral retropharyngeal lymph nodes, above supraclavicular fossa; < 6 cm

N2 Bilateral cervical above supraclavicular fossa; < 6 cm

N3a >6 cm; N3b Supraclavicular fossa

Stage I	T1	N0
Stage II	T1	N1
	T2	N0, N1
Stage III	T1, T2	N2
	T3	N0, 1, 2
Stage IVA	T4	N0, 1, 2
Stage IVB	Any T	N3
Stage IVC	Any T	Any N
M1		

Stage II compressed ←Changes from TNM 6 WWW.UICC.OFS



Mucosal Melanoma (upper aerodigestive) 7th ed - (new site)

T3 Epithelium/ submucosa (mucosal disease)

T4a Deep soft tissue, cartilage, bone, or

overlying skin

T4b Brain, dura, skull base, lower cranial

nerves, masticator space, carotid artery, prevertebral space, mediastinal structures, cartilage, skeletal muscle, or bone

STAGE GROUPING

Stage III T3 N0
Stage IVA T4a N0

T3-T4a N1

Stage IVB T4b Any N
Stage IVC Any T Any N
M1

Mucosal melanomas are aggressive tumours, therefore T1 and T2 and Stages I and II are omitted



TNM-7 Oesophagogastric junction tumours

A tumour the epicenter of which is within 5 cm of the esophagogastric junction and also extends into the oesophagus is classified and staged according to the oesophageal scheme

All other tumours with an epicenter in the stomach greater than 5 cm from the oesophagogastric junction or those within 5 cm of the EGJ *without* extension into the oesophagus are staged using the gastric carcinoma scheme



Oesophagus 7th edition

TNM definitions: AJCC = UICC

Tis	Carcinoma in situ /High-grade dysplasia
T1	lamina propria or submucosa
	T1a lamina propria or muscularis
	mucosae
	T1b submucosa
T2	muscularis propria
T3	adventitia
T4	adjacent structures
	T4a pleura, pericardium,
	diaphragm, or adjacent
	peritoneum
	T4b other adjacent structures,
	e.g. aorta, vertebral body,
	trachea

N0	No regional lymph node metastasis
N1	1 to 2 regional lymph nodes
N2	3 to 6
N3	>6
[N1	was site dependent]

M - Distant MetastasisM1 Distant metastasis[M1a,b were site dependent]

Changes from 6th edition



Oesophagus 7th edition

Anatomical Stage Groups (adeno & squamous) [UICC]

Stage IA	T1	N0	MO
Stage IB	T2	N0	MO
Stage IIA	T3	N0	MO
Stage IIB	T1, T2	N1	MO
Stage IIIA	T4a	N0	MO
	Т3	N1	MO
	T1, T2	N2	MO
Stage IIIB	T3	N2	MO
Stage IIIC	T4a	N1, N2	MO
	T4b	Any N	MO
	Any T	N3	MO
Stage IV	Any T	Any N	M1
			Major changes

VWW.UICC.OFS



Oesophageal Squamous Cell Carcinoma <u>Prognostic</u> Grouping

[AJCC adds type, grade & site]

	Т	N	M	Grade	Location
Stage IA	1	0	0	1,X	Any
IB	1	0	0	2,3	Any
	2, 3	0	0	1,X	Lower
Stage IIA	2, 3	0	0	1,X	Upper, middle
	2, 3	0	0	2,3	Lower
Stage IIB	2, 3	0	0	2,3	Upper, middle
	1, 2	1	0	Any	Any
Stage IIIA	1,2		2	0	Any
	3	1	0	Any	Any
	4a	0	0	Any	Any
Low Stages: AJCC not all = UICC.			Stage	s IIIA,B, C & IV	: AJCC=UICC



Oesophageal <u>Adenocarcinoma</u> Prognostic Grouping

[AJCC adds type & grade]

	Т	N	M	Grade
Stage IA	1	0	0	1, 2, X
Stage IB	1	0	0	3
	2	0	0	1, 2, X
Stage IIA	2	0	0	3
Stage IIB	3 (IIA)	0	0	Any
	1, 2	1	0	Any
Stage IIIA	1, 2	2	0	Any
	3	1	0	Any
	4a	0	0	Any
Stage IIIB, IIIC, & IV				
Low Stages: AJCC not all = UICC. Stages IIIB, C & IV:				



Stomach 7th edition

T1 Lamina propria, submucosa T1a Lamina propria

T1b Submucosa

T2 Muscularis propria

T3 Subserosa (was T2b)

T4a Perforates serosa (was T3)

T4b Adjacent structures

N1 1 to 2 nodes

N2 3 to 6 nodes (was N1)

N3a 7 - 15 nodes (was N2)

N3b 16 or more (was N3)

Changes from 6th edition

Stage IA	T1	N0		
Stage IB	T2	N0		
	T1	N1		
Stage IIA	T3	N0		
	T2	N1		
	T1	N2		
Stage IIB	T4a	N0		
	T3	N1		
	T2	N2		
	T1	N3		
Stage IIIA	T4a	N1		
	T3	N2		
	T2	N3		
Stages IIIB,	IIIC, IV			
	Stages: most changed			

RNATIONAL UNION AGAINST CANCE



Gastrointestinal Stromal Tumours (GIST) 7th ed - new chapter

All sites:

 $T1 \le 2 \text{ cm} T3 > 5-10 \text{ cm}$ T2 > 2 - 5 cm T4 > 10

cm

StageGrouping - Small Intestine

Mitotic rate

Stage I T1-2 N0 M0 Low
Stage II T3 Low
Stage IIIA T1 High

T4 Low

Stage IIIB T2, 3, 4 High

Stage IV Any T N1 M0 Any

Any T Any N M1 Any

Prognostic factors: site, size, mitotic rate

Stage Grouping - Stomach

<u>Mitotic</u>

<u>rate</u>

Stage IA T1-2 N0 M0 Low

Stage 1B T3 Low

Stage II T-2 High

T4 Low

Stage IIIA T3 High

IIIB T4 High

Stage IV Any T N1 M0 Any

Any T Any N M1 Any



Carcinoids and Neuroendocrine tumours

Staging

GI tract:

- Carcinoid: separate staging by site
- Small cell/large cell: stage as carcinoma

Pancreas: stage as carcinoma

Lung: stage as carcinoma

Skin: separate classification for Merkel cell carcinoma



Carcinoids (NET) — 7th edition Gastrointestinal

Appendix

 $T1 \leq 2 \text{ cm}$

T2 > 2 - 4 cm; cecum

T3 > 4 cm; ileum

T4 Perforates peritoneum; other organs, structures

Small Intestine

T1 Lam propria/ submucosa and ≤ 1 cm

T2 Muscularis propria or > 1 cm

T3 Jejunal, ileal: subserosa.

Ampullary, duodenal: pancreas or retroperitoneum`

T4 Perforates serosa; adjacent structures

Stomach

Tis < 0.5 mm confined to mucosa

T1 Lam propria or submucosa & ≤ 1cm

T2 Muscularis propria or > 1 cm

T3 Subserosa

T4 Perforates serosa; adjacent structures

Large Intestine

T1 Lam propria or submucosa or <2cm T1a <1 cm; T1b 1 to 2 cm

T2 Muscularis propria or >2 cm

T3 Subserosa, or pericolorectal tissues

T4 Perforates serosa; adjacent structures



Carcinoids (NET) – 7th edition

Stage Groups

Carc	ino	id:	Ap	pen	dix
Odio			, , , p	POI	

Stage I T1 N0
Stage II T2, T3 N0
Stage III T4 N0
Any T N1
Stage IV Any T Any N M1

Carcinoid: other GI sites

Stage I T1 N₀ T2 Stage IIA N0 IIB T3 N0 Stage IIIA T4 N0 IIIB Any T N1 Stage IV Any T Any N M1

ery || similar



Appendix— 7th edition

Carcinoid

Carcinoma

T1 < 2 cm

T2 > 2 - 4 cm; cecum

T3 > 4 cm; ileum

T4 Perforates peritoneum; other organs, structures

N1 Regional

Stage I T1 N0

Stage II T2, T3 N0

Stage III T4 N0

Any T N1

Stage IV Any T Any N M1

Based mainly on size

T1 Submucosa

T2 Muscularis propria

T3 Subserosa, non-peritonealize periappendiceal tissues

T4a Perforates visceral peritoneum/Mucinous peritoneal tumour within right lower quadrant

T4b Other organs or structures

N1 ≤3 regional

N2 > 3 regional

M1a Intraperitoneal metastasis beyond right lower quadrant

M1b Non-peritoneal metastasis

Like colon, based on depth; includes goblet cell carcinoid



Appendix— 7th edition

Carcinoma (was part of colon classification)

Colon - Rectum

T4 Tumour directly invades other

organs or structures and/or perforates visceral peritoneum

T4a perforates visceral peritoneum

T4b directly invades other organ or

structures

M – Distant Metastasis: colon

M1 Distant metastasis

M1a one organ

M1b > one organ or peritoneum

Changes from TNM 6

Appendix - Carcinoma: Separate mucinous from nonmucinous carcinomas

T4a Perforates visceral peritoneum/Mucinous peritoneal tumour within right lower quadrant

T4b Other organs or structures

M1a Intraperitoneal metastasis beyond RLO

M1b Non-peritoneal metastasis

Changes from colon



Colon - Rectum - 7th edition

T4 Tumour directly invades other organs or structures and/or perforates visceral peritoneum

T4a perforates visceral peritoneum T4b directly invades other organ or structures

M1 Distant metastasis

M1a one organ

M1b > one organ or peritoneum

Basic categories unchanged Subdivisions expanded

N1 Metastasis in 1 to 3 regional lymph nodes

N1a 1 node

N1b 2-3 nodes

N1c satellites in subserosa, *without* regional nodes*

N2 Metastasis in 4 or more regional lymph nodes

N2a 4 - 6 nodes

N2b 7 or more nodes

Basic categories unchanged Subdivisions expanded

Changes from 6th edition



Colon - Rectum - 7th edition

Stage 0	Tis	N0
Stage I	T1, T2	N0
Otomo II	TO T4	NO
Stage II	T3, T4	N0
Stage IIA		T3
N	0	
Stage IIB		T4a
N	0	
Stage IIC		T4b
N	0	
Basic catego	ories unchanged	
Subdivisions	expanded	
	Changes	from TNM 6

Stage III	Any T N1-2		
Stage IIIA	T1, T2		N1
	T1		
	N2a		
Stage IIIB	T3, T4a		N1
	T2-T3		
	N2a		
	T1-T2		
	N2b		
Stage IIIC	T4a		
	N2a		
	T3-T4a		
	N2b		
	T4b		
	N1-2		
Stage IV	Any T	Any N	
	M1		
Stage IVA	Any T	Any N	
	M1a		
Stage IVB	Any T	Any N	
	M1b		



Extrahepatic bile ducts 7th ed

Proximal bile duct (New site)

(right, left and common hepatic ducts)

T1 Ductal wall

T2a Beyond ductal wall

T2b Adjacent hepatic parenchyma

T3 Unilateral portal vein or hepatic artery branches

T4 Main portal vein or branches bilaterally;

. . .

N1 Regional

STAGE GROUPS (Proximal)

Stage I T1 N0

Stage II T2a-b N0

Stage IIIA T3 N0

Stage IIIB T1-3 N1

Stage IVA T4 Any N

Stage IVB Any T Any N M1

Distal Extrahepatic Bile Ducts

(from cystic duct insertion into common hepatic duct)

T1 Ductal wall

T2 Beyond ductal wall

T3 adjacent organs

T4 Celiac axis, or superior mesenteric artery

N1 Regional

STAGE GROUPS (Distal)

Stage IA T1 N0

Stage IB T2 N0

Stage IIA T3 N0

Stage IIB T1 – 3 N1

Stage III T4 Any N

Stage IV Any T Any N M1

No change



Lung – 7th edition

includes non-small cell and small cell carcinoma & carcinoid

T1 <3 cm

T1a <2 cm

T1b > 2 - 3 cm

T2 Main bronchus ≥2 cm from carina, invades visceral pleura, partial atelectasis

T2a > 3-5 cm

T2b > 5 cm - 7 cm

T3 >7 cm; chest wall, diaphragm, pericardium, mediastinal pleura, main bronchus <2 cm from carina, total atelectasis, separate nodule(s) in same lobe (was T4)

T4 Mediastinum, heart, great vessels, carina, trachea, oesophagus, vertebra; separate tumour nodule(s) in a different ipsilateral lobe (was M1)

N1 Ipsilateral peribronchial, ipsilateral hilar

N2 Ipsilateral mediastinal, subcarinal

N3 Contralateral mediastinal or hilar, scalene or supraclavicular

M1a Separate tumour nodule(s) in a contralateral lobe; pleural nodules or malignant pleural or pericardial effusion (was T4)

M1b Distant metastasis

Changes from 6th edition



Lung – 7th edition

includes non-small cell and small cell carcinoma & carcinoid

Occult ca	rcinoma N0	TX	
Stage 0	N0	Tis	
Stage IA	NO	T1a, b	
Stage IB	NO	T2a	
Stage IIA		T2b	
	N0	NIA	T1a, b
	T2a	N1	N1
Stage IIB	N1	T2b	
	INI	T3	
	N0		

Stage IIIA T1a,b, T2a,b	N2
Т3	N1, N2
T4	N0, N1
Stage IIIB T4	N2
Any T	N3
Stage IV Any T Any N	M1

Changes to the 6th edition are based upon recommendations from the IASLC Lung Cancer Staging Project (retrospective study of 80,000 cases)

One classification for several tumor types; must separate tumors by histology.

Changes from 6th edition



Skin 7th ed - carcinomas

6th ed

T1 <2 cm

T2 >2 to 5 cm

T3 >5 cm

T4 Deep extradermal structures

(bone, muscle...)

N1 Regional

7th ed

T1 <2 cm

T2 >2 cm

T3 Deep: Muscle, bone, cartilage, jaws, orbit

T4 Skull base, axial skeleton

N1 single <3 cm

N2 single ≥3 to 6 cm, multiple ≤6 cm

N3 >6 cm



Skin 7th ed - carcinomas

6th ed

Stage I T1 N0

Stage II T2, T3 N0

Stage III T4 or N1

Stage IV Any T Any N M1

High Risk Factors (AJCC)

>4 mm thickness, Clark IV

Perineural invasion

Lymphovascular invasion

Ear, non-glabrous lip

Poorly or undifferentiated

*Stage I with > one high risk factor = Stage II →

Anatomical Stage Groups

Stage I T1 N0

Stage II T2 N0

Stage III T3 N0

T1, 2, 3 N1

Stage IV T1, 2, 3 N2

T4 or N3 or M1

AJCC Prognostic Groups

Stage I * T1 N0

Stage II T2 N0

Stage III and IV: Same as anatomical

above



Skin 7th edition

Skin Carcinoma

Merkel Cell carcinoma

7th ed

T1 <2 cm

T2 >2 cm

T3 Deep: Muscle, bone, cartilage, jaws, orbit

T4 Skull base, axial skeleton

N1 single <3 cm

N2 single \geq 3 to 6 cm, multiple \leq 6 cm

N3 >6 cm

Merkel cell

T1 <2 cm

T2 > 2 to 5 cm

T3 >5 cm

T4 Deep extradermal structures (bone, muscle...)

N1a microscopic metastasis

N1b macroscopic metastasis

N2 In transit metastasis

M1a skin, subcut, non-regional nodes

M1b lung

M1c other sites

Differs from other skin carcinoma



Skin 7th edition

Skin Carcinoma

Merkel cell

carcinoma

Stage I	T1	N0		
Stage II	T2	N0		
Stage III	T3	N0		
	T1, 2, 3	N1		
Stage IV	T1, 2, 3	N2		
	T4 or	N3	or	M1

pN0 = microscopically confirmed

cN0 = nodes neg. clinically; not micro confirmed

Merkel cell carcinoma		
Stage I IA IB T1	T1 T1 cN0	N0 pN0
Stage IIA IIB IIC	T2, 3 T2, 3 T4	pN0 cN0 N0
Stage IIIA IIIB	Any T Any T	N1a N1b, N2
Stage IV Any T	Any N	M1



Vulva-7th ed

T1	Confined to vulva/perineum
T1a T1b T2	≤ 2 cm with stromal invasion ≤ 1.0 mm > 2 cm or stromal invasion > 1.0 mm Lower urethra/vagina/anus
ТЗ	Upper urethra/vagina, bladder
N1a	rectal/mucosa, bone, fixed to pelvic bone One or two nodes < 5 mm
N1b	One node ≥ 5 mm
N2a	3 or more nodes < 5 mm
N2b	2 or more nodes ≥ 5 mm
N2c	Extracapsular spread
N3	Fixed, ulcerated
M1 Major cha	Distant nges in T & N categories and stage grouping

STAGE GROUPING			
Stage 0	Tis	N0	MO
Stage I	T1	N0	MO
Stage IA	T1a	N0	MO
Stage IB	T1b	N0	MO
Stage II	T2	N0	MO
Stage IIIA	T1, T2	N1a, N1b	MO
Stage IIIB	T1, T2	N2a, N2b	MO
Stage IIIC	T1, T2	N2c	MO
Stage IVA	T1, T2	N3	MO
		T3	Any N
	MO		
Stage IVB	Any T	Any N	M1



Uterine Sarcomas - 7th ed

Leiomyos sarcoma	sarcoma/E	ndometrial stromal	
1	Tumor I	Tumor limited to uterus	
	IA	< 5 cm	
	IB	> 5 cm	
Ш	Beyond	Beyond uterus, in pelvis	
	IIA	Adnexal	
	IIB	Other pelvic tissues	
III	Tumor i	Tumor invades abdominal tissues	
	IIIA	One site	
	IIIB	> one site	
	IIIC	Pelvic/para-aortic nodes	
	IVA	Tumor invades bladder/rectum	
	IVB	Distant metastasis	
Carcinos carcinom		aged as endometrial	

Adenosarcoma		
	Tumor limited to uterus	
	IA	Endometrium/endocervix
	IB	< half myometrium
	IC	>half myometrium
	Beyond uterus, in pelvis	
	IIA	Adnexal
	IIB	Other pelvic tissues
III	Tumor invades abdominal tissues	
	IIIA	One site
	IIIB	> one site
	IIIC	Pelvic/para-aortic nodes IVA
	Invades bla	adder/rectum
IVB	Distant me	tastasis



Prostate- 7th edition

T1 Not palpable or visible

T1a ≤5% or less

T1b >5%

T1c Detected by needle biopsy

T2 Confined within prostate

T2a \leq half of one lobe

T2b > half of one lobe

T2c Both lobes

T3 Through prostate capsule

T3a Extracapsular

T3b Seminal vesicle(s)

T4 Fixed or invades adjacent structures

No change from 6th

STAGE GROUPING (ANATOMIC)

(UICC)

Stage I T1, T2a N0

Stage II T2b-2c N0

Stage III T3 N0

Stage IV T4 N0

Any T N1

Any T Any N M1

Change from 6th Grade was in 6th

WWW.UICC.OFS



Prostate- 7th ed

I T1a-c N0 PSA <10 Gle \leq 6 T2a N0 PSA <10 Gle < 6

IIA T1 a - c N0 PSA < 20 Gle 7 T1 a - c N0 PSA \geq 10 < 20 Gle < 6 T2a,b N0 PSA \geq 10 < 20 Gle \leq 7 IIB T₂c N0 Any PSA Any Gle T 1-2 N0 $PSA \ge 20$ Any Gle T 1-2 N0 Any PSA Gle \geq 8 Ш T3a-c N0 Any PSA Any Gle IV T4 Any PSA Any Gle N0 Any PSA Any Gle Any T N1 Any T Any N M1 Any PSA Any Gle

If PSA or Gleason is missing, use whatever is available

If both missing, no prognostic grouping is possible



Adrenal Cortical Carcinoma - 7th **edition**

(new site)

T1 \leq 5 cm, no extra-adrenal invasion

T2 > 5 cm, no extra-adrenal invasion

T3 Local invasion

T4 Adjacent organs

N1 Regional

M1 Distant

Stage I T1 N₀ T2 Stage II N₀ Stage III T1, T2 N1 T3 N₀ Stage IV T3 N1 T4 Any N

Any T Any N M1



What else is new?

Pn Perineural Invasion

PnX Perineural invasion cannot be

assessed

Pn0 No perineural invasion

Pn1 Perineural invasion



What else is new?

Tumour deposit or satellite in colorectal cancer

- N1c
 Tumour deposit(s), i.e. satellites, in the subserosa, or in non-peritonealized pericolic or perirectal soft tissue without regional lymph node metastasis
- If a nodule is considered by the pathologist to be a totally replaced lymph node (generally having a smooth contour), it should be recorded as a positive lymph node and counted as such i.e., N1a,N1b, N2a or N2b



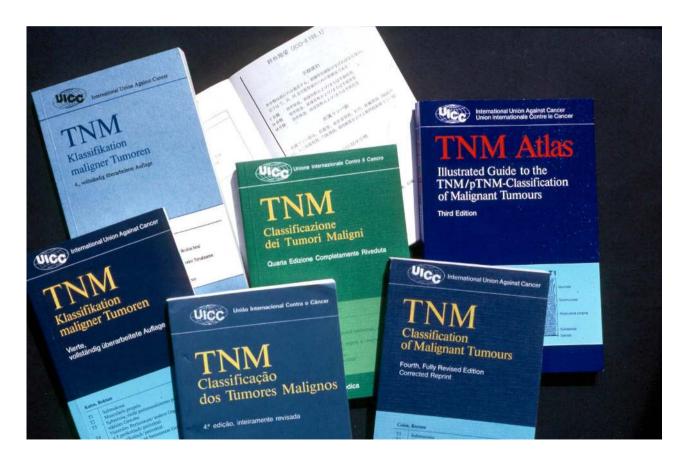
Additional Material

www.uicc.org/tnm

- Web page
- FAQ: Answers to frequently asked questions about TNM
- Helpdesk for questions on TNM not answered by the FAQ
- Guidelines on how to use TNM
- Glossary of terms used
- How to propose changes for the 8th edition



Translations of 7th edition planned





Coming Soon

