The 8th Edition of the TNM Classification for Lung Cancer

An AJCC Webinar

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Nomenclature

- **Components:** T, N and M
- **Categories:** T1a, etc.; N0, etc.; M1a, etc.
- **Descriptors:** what defines the categories

Content of this presentation

- Database
- Innovations and clinical implications of the 8th edition
- Summary
- Conclusions

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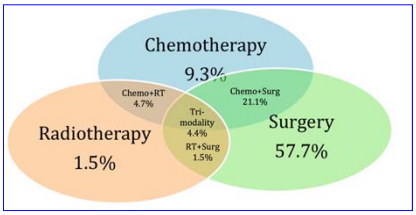
Database for the 8th edition

Region	Number	%
Europe	46,560	49
Asia	41,705	44
North America	4,660	5
Australia	1,593	1.7
South America	190	0.3
TOTAL	**94,708**	**100**



Type of data	Number of cases
Retrospective	73,251
Prospective	3,905
TOTAL	**77,156**

Rami-Porta R et al. J Thorac Oncol 2014; 9: 1618-1624

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T descriptors

- Tumour size
- Endobronchial location
- Atelectasis/pneumonitis
- Visceral pleura invasion
- Invasion of peripheral structures
- Invasion of central structures
- Separate tumour nodules in same lobe, same lung, contralateral lung

24 descriptors

T component

- Pathologic populations
  - pT1-4 N0 M0 R0
  - pT1-4 any N M0 R0
  - pT1-4 any N M0 any R
- Clinical populations
  - cT1-4 N0 M0
  - cT1-4 any N M0

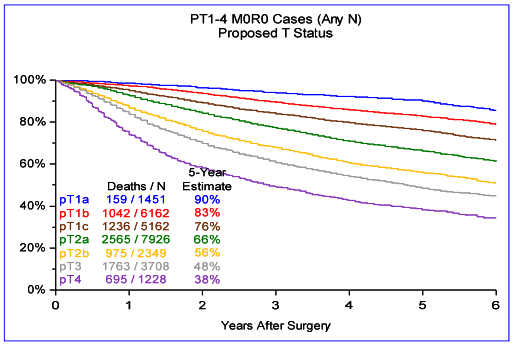
- Univariate and multivariate analyses
- Adjusted for histology, region, age and sex

T: results

- Size: every cm counts
- Tumour size as descriptor in all T categories
- VPI: no change
- T2 & T3 endobronchial: same prognosis
- T2 & T3 atelectasis: same prognosis
- T3 diaphragm has a T4 prognosis
- T3 mediastinal pleura, rarely used

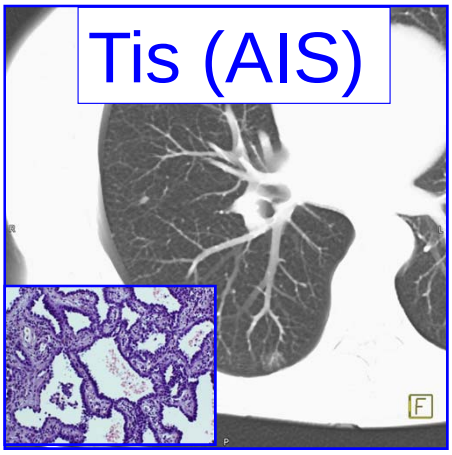
The T component

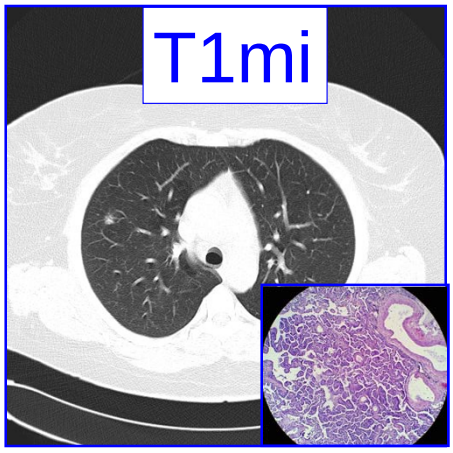
Descriptor	Category
</= 1 cm	T1a
>1-2 cm	T1b
>2-3 cm	T1c
>3-4 cm	T2a
>4-5 cm	T2b
>5-7 cm	T3
>7 cm	T4
Bronchus < 2 cm	T2
Total atelectasis	T2
Diaphragm	T4



Rami-Porta R et al. J Thorac Oncol 2015; 10: 990-1003.

New T categories





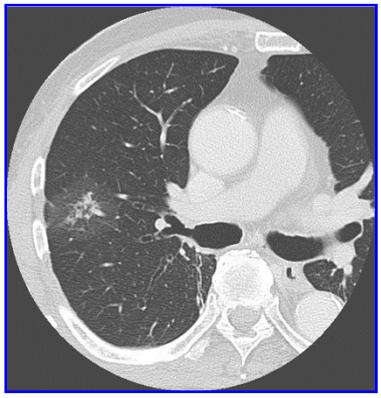
Travis W et al. J Thorac Oncol 2016; 11: 1204-1223.

The T component

Size measurement in part-solid non-mucinous ADK

Clinical size:
size of
solid component

Pathologic size:
size of
invasive component

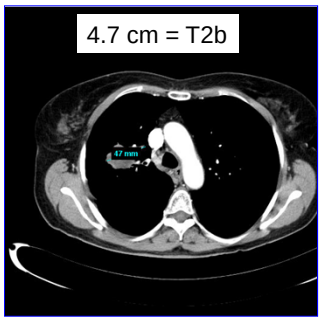


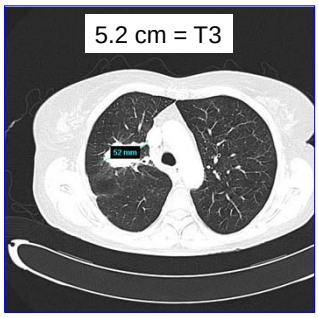
Courtesy of Dr. H. Asamura

Travis W et al. J Thorac Oncol 2016; 11: 1204-1223.

The T component

Measurement of tumour size



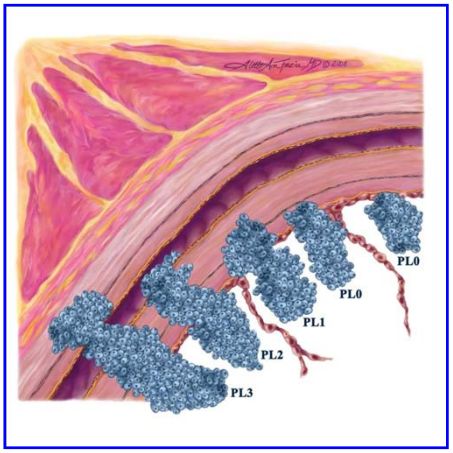


IASLC recommendation for the measurement of tumour size:

Lung window

Travis W et al. J Thorac Oncol 2016; 11: 1204-1223.

Visceral pleura invasion



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PL0:	----
PL1 y PL2:	T2
PL3:	T3

In case of doubt about the visceral pleura involvement, the use of elastic stains is recommended

Travis WD et al.
JTO 2008;3:1384-90

Frequency of VPI

Apparent Stage IA Histological subtype	N of cases	VPI, n (%) Elastic stains
Adenocarcinoma	46	8 (17%)
Bronchioloalveolar	15	0 (0%)
Squamous	31	8 (26%)
Large cell	7	2 (29%)
Adenosquamous	1	1 (100%)
Total	100	**19 (19%)**

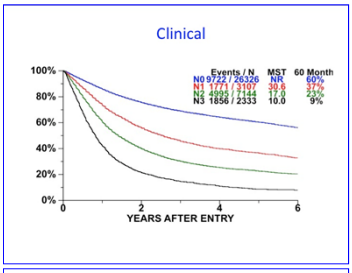
Use of elastic stains: 49 pathologists: never 25 (51%), some times 14 (29%) , always 10 (20%)

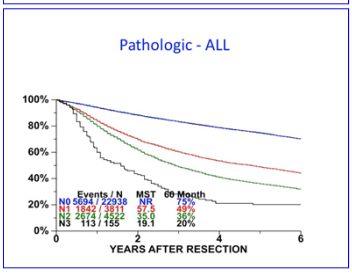
Taube JM et al. Am J Surg Pathol 2007; 31: 953-956

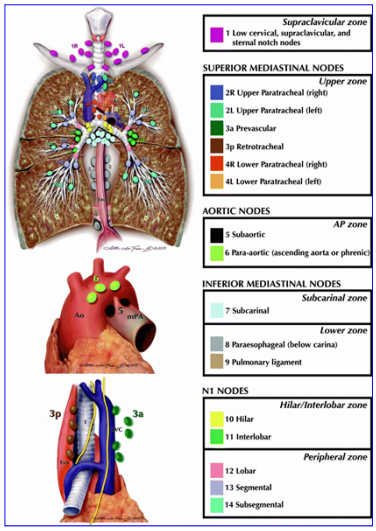
Implications for clinical practice: T

- Every cm counts; careful follow-up
- Accurate tumour size measurement, important
- Worse prognosis of larger tumours
- Better prognosis for endobronchial location and total atelectasis and pneumonitis
- Prognosis refinement
- Better stratification for clinical trials

The N component

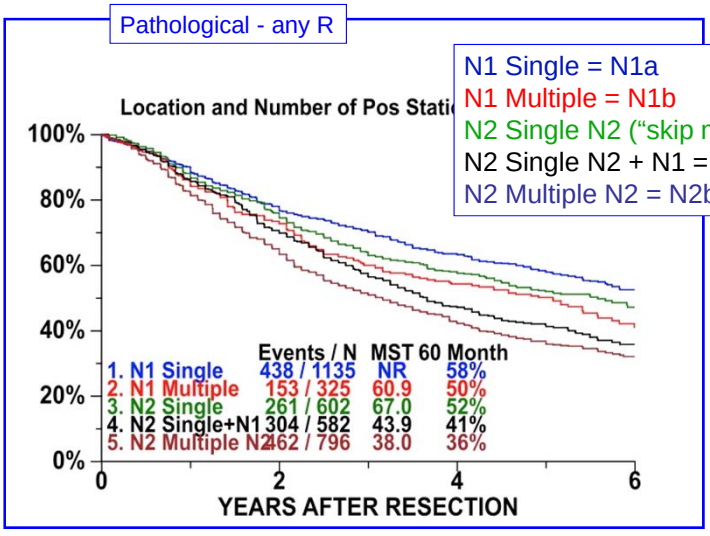






Asamura H et al. J Thorac Oncol 2015; 10: 1675-84.---Rusch V et al. J Thorac Oncol 2009; 4: 568-577.

Quantification of nodal disease



Asamura H et al. J Thorac Oncol 2015; 10: 1675-84.

N: recommendations

- To keep the present descriptors as they are
- To propose new descriptors for prospective testing:
  - pN1a: involvement of single pN1 nodal station
  - pN1b: involvement of multiple pN1 nodal stations
  - pN2a1: involvement of single pN2 nodal station without pN1 (skip pN2)
  - pN2a2: involvement of single pN2 nodal station with pN1
  - pN2b: involvement of multiple pN2 nodal stations
  - pN3: as it is

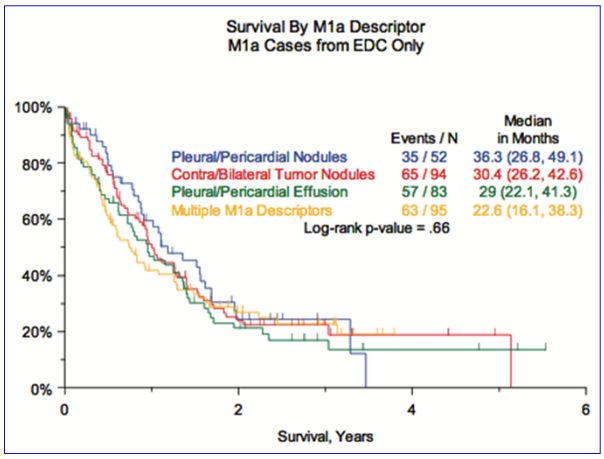
Asamura H et al. J Thorac Oncol 2015; 10: 1675-1684.

Implications for clinical practice: N

- The amount of nodal disease has prognostic impact
- Important to quantify nodal disease both at clinical and pathologic staging
- Upfront resection for single station cN2 will be discussed
- Prognosis refinement
- Better stratification

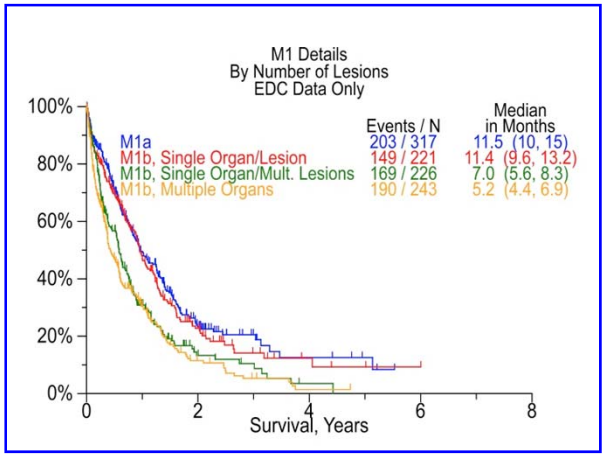
The M component: M1a

Prognosis for the different M1a descriptors is similar.



Eberhardt W et al. J Thorac Oncol 2015; 10: 1515-1522.

The M component: M1b



M1a

M1b

M1c

M1c

Eberhardt W et al. J Thorac Oncol 2015; 10: 1515-1522.

Implications for clinical practice: M

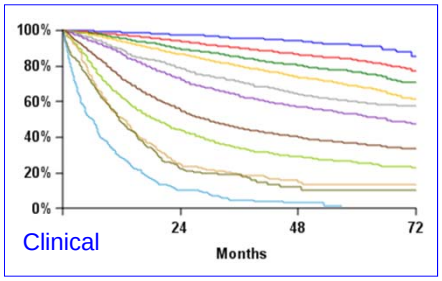
- Number of M1s is more important than their location
- M1b: baseline definition of oligometastases and oligoprogression
- Prognosis refinement
- Better stratification

Stage groupings

	N0	N1	N2	N3	M1a any N	M1b any N	M1c any N
T1a	IA1	IIB	IIIA	IIIB	IVA	IVA	IVB
T1b	IA2	IIB	IIIA	IIIB	IVA	IVA	IVB
T1c	IA3	IIB	IIIA	IIIB	IVA	IVA	IVB
T2a	IB	IIB	IIIA	IIIB	IVA	IVA	IVB
T2b	IIA	IIB	IIIA	IIIB	IVA	IVA	IVB
T3	IIB	IIIA	IIIB	IIIC	IVA	IVA	IVB
T4	IIIA	IIIA	IIIB	IIIC	IVA	IVA	IVB

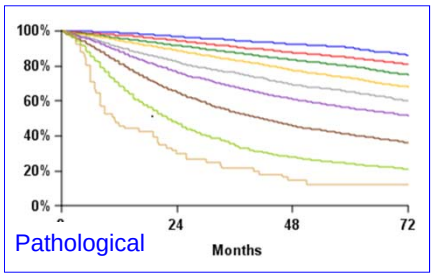
Goldstraw P et al. J Thorac Oncol 2016; 11: 39-51.

Stage grouping for the 8th edition



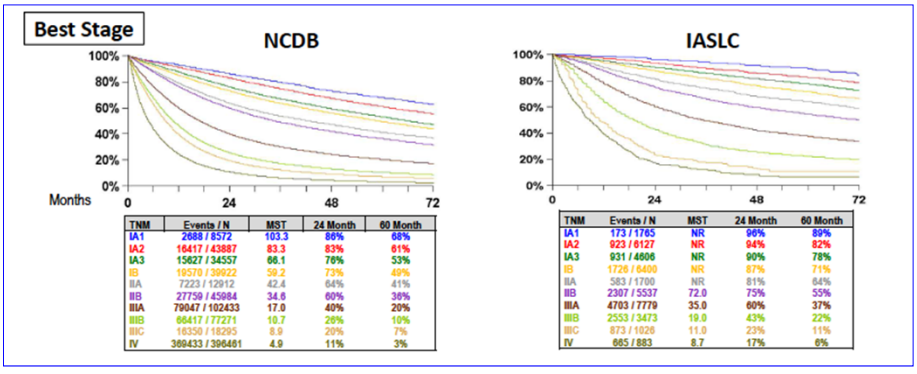
	Events/N	MST	24 months	60 months
IA1	68/781	NR	97%	92%
IA2	505/3105	NR	94%	83%
IA3	546/2417	NR	90%	77%
IB	560/1928	NR	87%	68%
IIA	215/585	NR	79%	60%
IIB	605/1453	66.0	72%	53%
IIIA	2052/3200	29.3	55%	36%
IIIB	1551/2140	19.0	44%	26%
IIIC	831/986	12.6	24%	13%
IVA	336/484	11.5	23%	10%
IVB	328/398	6.0	10%	0%

Goldstraw P et al. J Thorac Oncol 2016; 11: 39-51.



	Events/N	MST	24 months	60 months
IA1	139/1389	NR	97%	90%
IA2	823/5633	NR	94%	85%
IA3	875/4401	NR	92%	80%
IB	1618/6095	NR	89%	73%
IIA	556/1638	NR	82%	65%
IIB	2175/5226	NR	76%	56%
IIIA	3219/5756	41.9	65%	41%
IIIB	1215/1729	22.0	47%	24%
IIIC	55/69	11.0	30%	12%

Validation with National Cancer Database



Chansky K et al. J Thorac Oncol 2017; 12: 1109-1121.

Cancers with multiple lesions

Multiplicity of lesions is defined by DISEASE PATTERN

1. Second primary lung cancers
2. Separate tumour nodules
3. Multiple adenocarcinomas with GG/ lepidic features
4. Pneumonic type adenocarcinoma

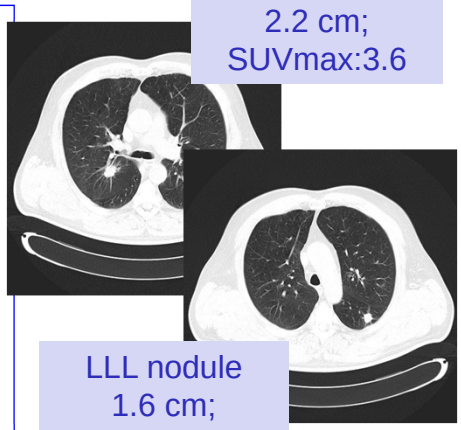
Detterbeck F et al. J Thorac Oncol 2016; 11: 639-650

Lung cancers with multiple lesions

Second primary tumours

Clinical data

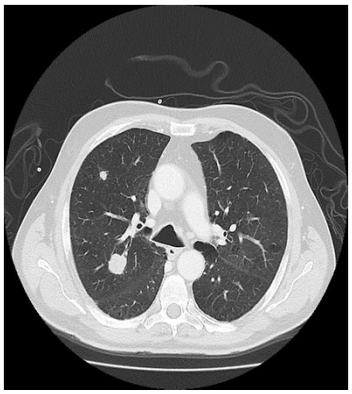
- Different histologic type
- Different radiographic appearance
- Different metabolic features
- Different biomarkers
- Different growth rate
- No nodal involvement or M1



Separate tumour nodules

- One typical solid lung cancer
- One or more separate solid nodules with similar CT features, with pressumed or confirmed same histologic type
- Thought NOT to be synchronous tumours
- WITHOUT GG features

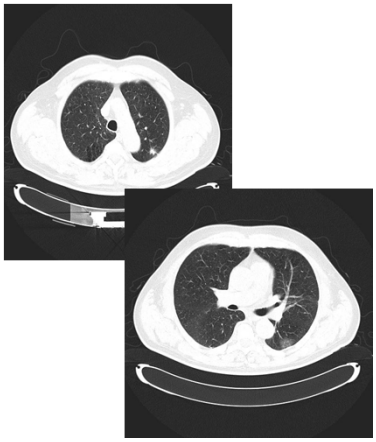
Clinical data



Multiple adenocarcinomas with GG/lepidic features

- Multiple sub-solid nodules (pure or part-solid) with at least one suspected (or proven) to be cancer
- With or without biopsy
- It applies to AIS, MIA and LPA
- GGOs <5cm suggestive of AAH do not count for TNM

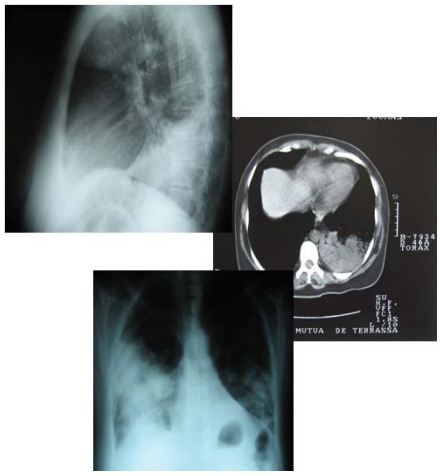
Clinical data



Pneumonic type adenocarcinomas

- Single or multiple areas of infiltrates or consolidation
- One lobe, one or both lungs
- GG, consolidation or both
- With or without biopsy
- NO discrete GG nodules
- NO pneumonia or atelectasis

Clinical data



Cancers with multiple lesions

1. Multiple primary tumours:
   - **One TNM for each tumour**
2. Separate tumour nodules:
   - **T3, T4, M1a**
3. Multiple adenos with GGO/lepidic features:
   - **Highest T (#/m) N M**
4. Pneumonic type adenocarcinoma:
   - **T3, T4, M1a**

Detterbeck F et al.
J Thorac Oncol
2016; 11 (5):
639-650
651-665
666-680
681-692

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Summary

- More relevance to tumour size
- Reclassification of some T descriptors
- Validation of present N descriptors
- Acknowlegment of relevance of quantification of nodal disease
- Three metastatic groups
- More stages for better prognostic stratification
- More recommendations for uniform staging

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Conclusions

The innovations in the 8th edition of the TNM classification of lung cancer:

- increase our capacity to refine prognosis
- improve tumour stratification in future trials
- prompt future research
- facilitate homogeneous tumour classification and collection of prospective data