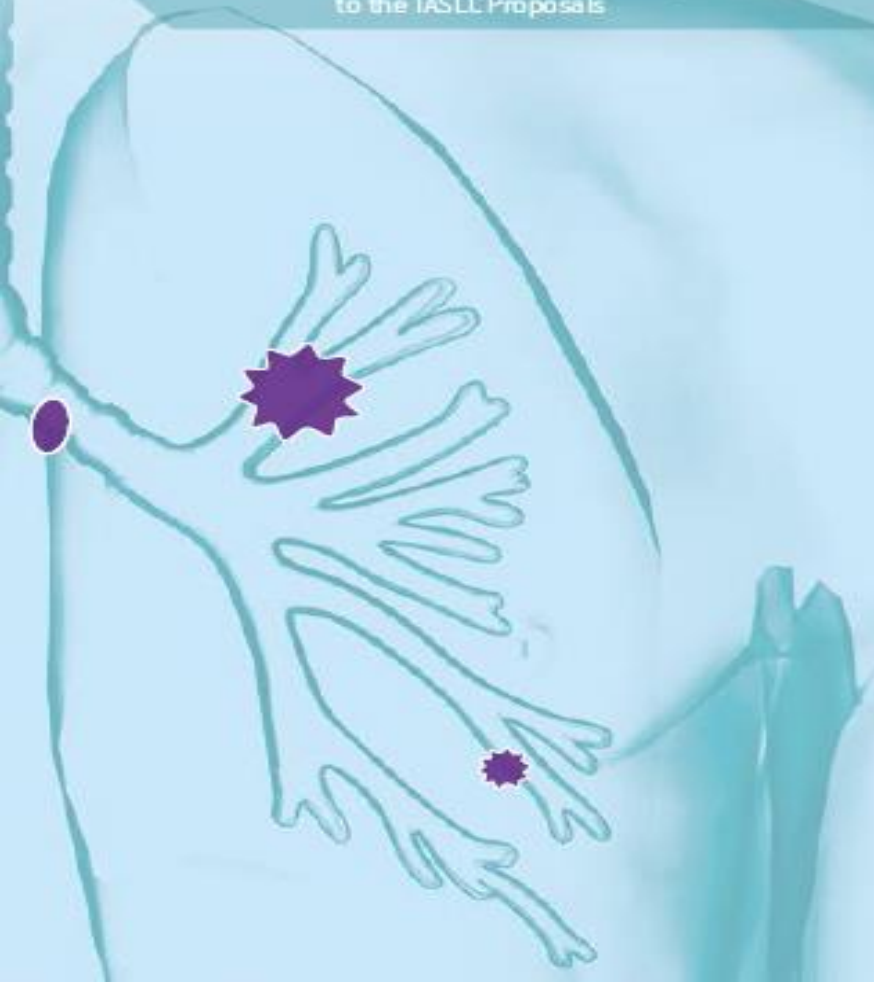


UPDATED
2016

Non-Small Cell Lung Cancer Staging Atlas

TNM Classification according
to the IASLC Proposals



ΕΝΩΣΗ ΠΝΕΥΜΟΝΟΛΟΓΩΝ ΕΛΛΑΔΑΣ

ΕΤΗΣΙΟ ΣΥΝΕΔΡΙΟ



“Νεότερα στη Σταδιοποίηση Καρκίνου Πνεύμονα”

Ιωάννης Χ. Γκιόζος
Πνευμονολόγος MD, PhD, FCCP

Ογκολογική Μονάδα Γ'ΠΠ
ΓΝΝΘΑ “Η Σωτηρία”

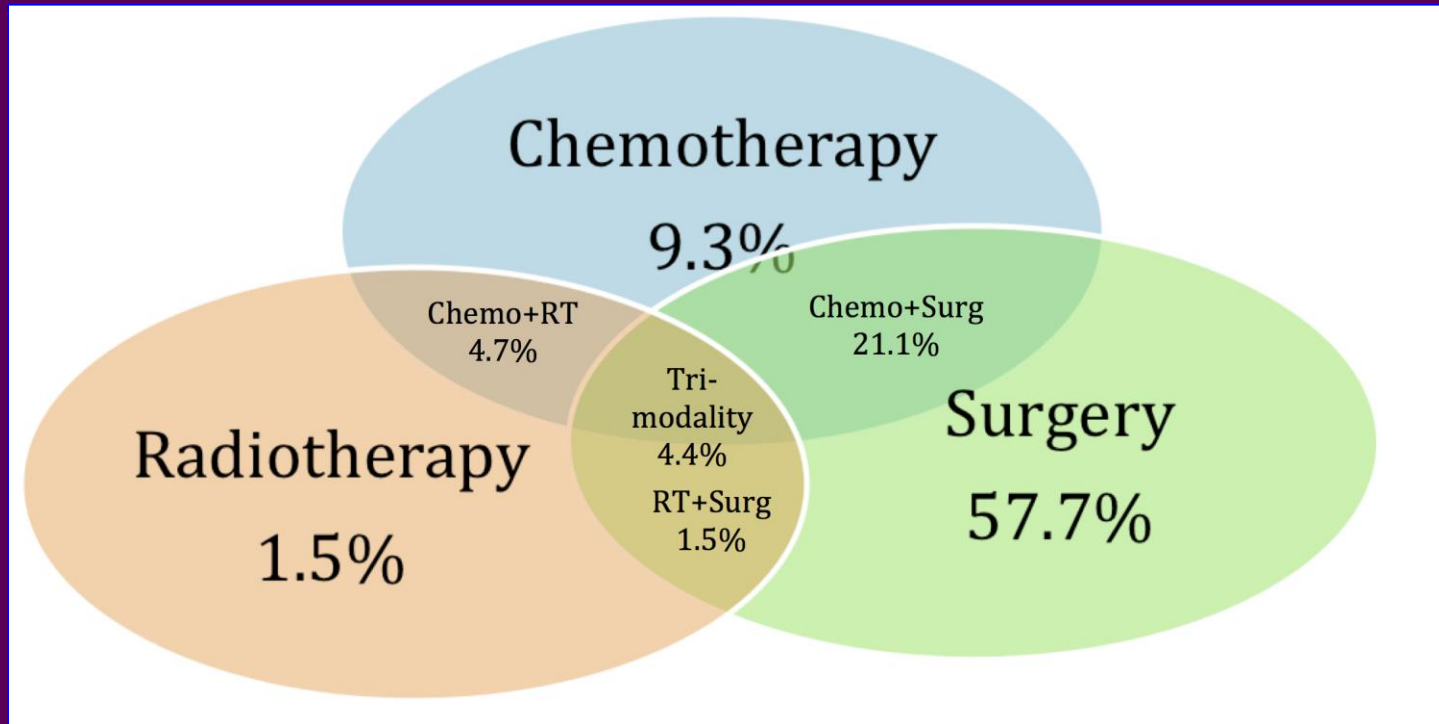
The IASLC Lung Cancer Staging Project: The New Database to Inform the Eighth Edition of the TNM Classification of Lung Cancer

TABLE 2. Number of Cases Submitted by Each Data Source by Continent

Region	Data Source	EDC Source
Asia	EDC	Guangdong General Hospital, China Shanghai Lung Tumor Clinical Medical Center, China
	Japan 1999	
	Japan 2002	
	Japan 2004	
Australia	South Korea	
	EDC	Peter MacCallum Cancer Centre
	Prince Charles Sydney	
Europe	Belgrade, Serbia	
	Denmark	
	EDC	Athens School of Medicine, Greece
		Clinical Center of Serbia, Serbia
		GCCB-S, Spain
		L'Institut Mutualiste Montsouris, France
		Military Medical Academy, Serbia
		Antwerp University Hospital, Multidisciplinary Oncological Centre Antwerp (MOCA), Belgium
		University Hospital Ghent, Belgium
		University of Torino, Italy
North and South America	Norway	
	Turkey	
	EDC	Alexander Fleming Institute, Argentina
		Clinica y Maternidad Suizo Argentina, Argentina
		Fundación Clínica Valle del Lili, Colombia
		Good Samaritan Hospital, USA
		Hospital Británico de Buenos Aires, Argentina
		Hospital Universitario Austral, Argentina
		Hospital Universitario-Fundación Favalaro, Argentina
		Hospital de Rehabilitación Respiratoria, Argentina
		Mayo Clinic Rochester, USA
		New York University Langone Medical Center and Cancer Center, USA
		Penrose Cancer Center, USA
		University of Sao Paulo Medical School, Brazil
		MDACC, USA
		MSKCC, USA

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

The IASLC Lung Cancer Staging Project: The New Database to Inform the Eighth Edition of the TNM Classification of Lung Cancer



TNM Classification according to the IASLC Proposals, updated 2016

Descriptor T

T

Primary Tumor

T0

No evidence of primary tumor

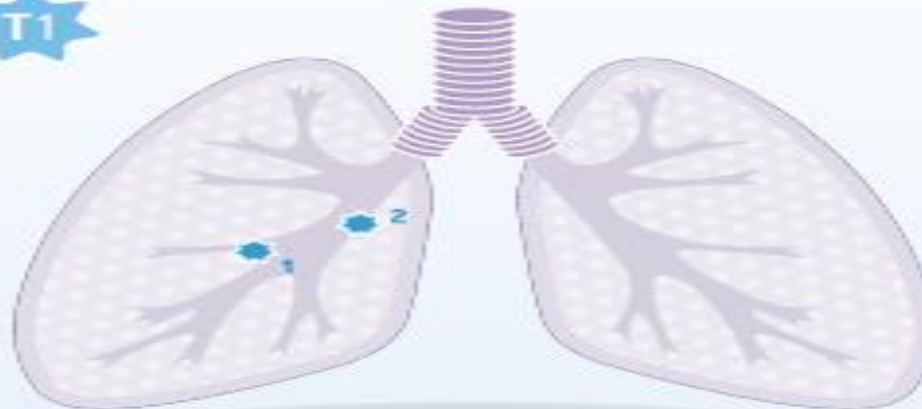
Tx

Primary tumor cannot be assessed or tumor proven by the presence of malignant cells in sputum or bronchial washings but not visualized by imaging or bronchoscopy

Tis

Carcinoma in situ

T1



- Tumor ≤ 3 cm in greatest dimension, surrounded by lung or visceral pleura ①, without bronchoscopic evidence of invasion more proximal than the lobar bronchus (i.e. not in the main bronchus)* ②

T1a(mi): Minimally invasive adenocarcinoma

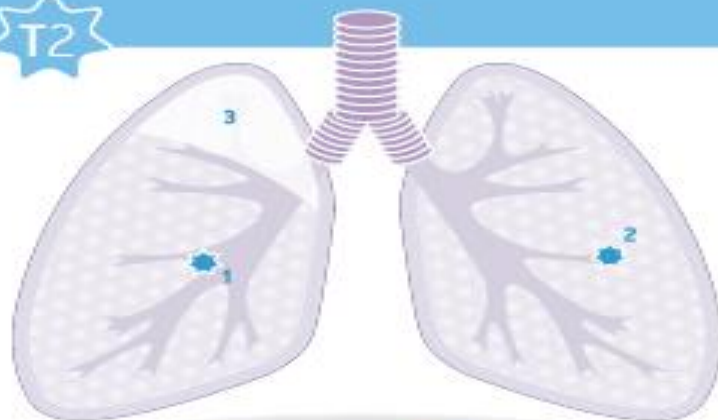
T1a: Tumor ≤ 1 cm in greatest dimension

T1b: Tumor > 1 cm but ≤ 2 cm in greatest dimension

T1c: Tumor > 2 cm but ≤ 3 cm in greatest

* The uncommon superficial spreading tumor of any size with its invasive component limited to the bronchial wall, which may extend proximally to the main bronchus, is also classified as T1a.

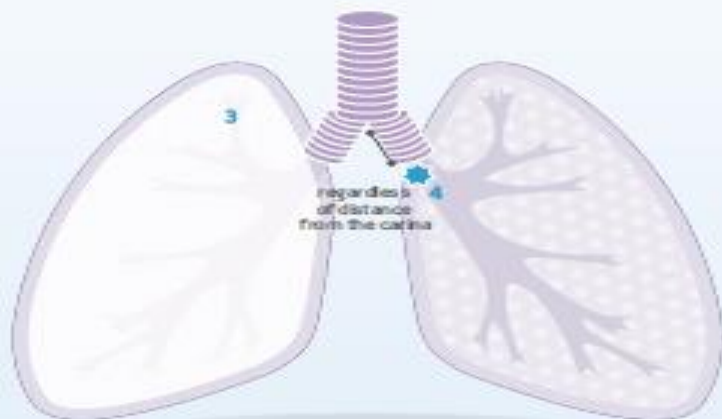
T2



- Tumor $> 3\text{cm}$ but $\leq 5\text{cm}$ ①

or ■ tumor with any of the following features:

- Invades visceral pleura ②
- Associated with atelectasis or obstructive pneumonitis that extends to the hilar region, involving part or all of the lung ③

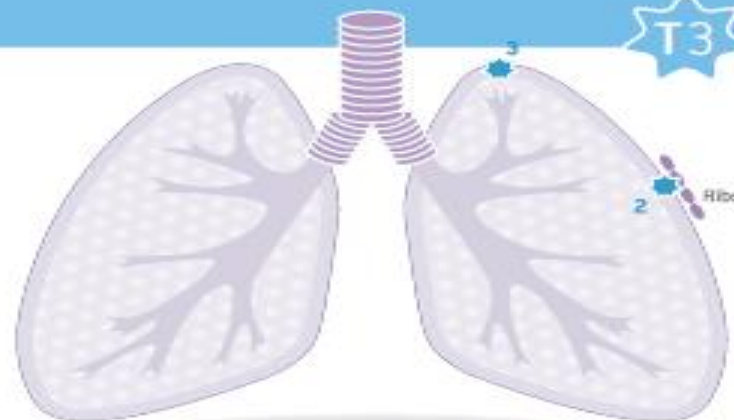


or ■ Involves main bronchus regardless of distance from the carina but without involvement of the carina ④

T2a: Tumor $> 3\text{cm}$ but $\leq 4\text{cm}$ in greatest dimension

T2b: Tumor $> 4\text{cm}$ but $\leq 5\text{cm}$ in greatest dimension

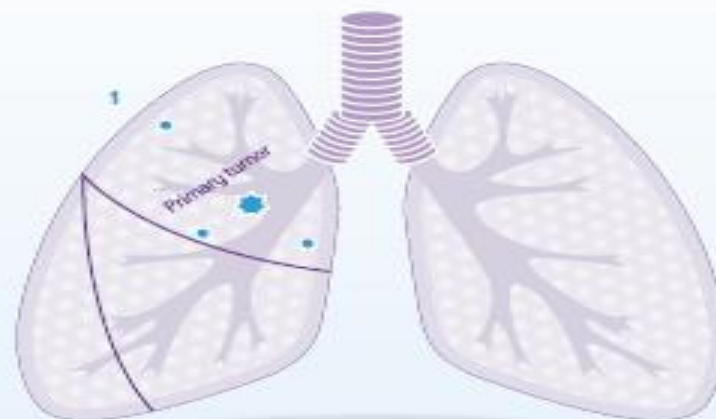
T3



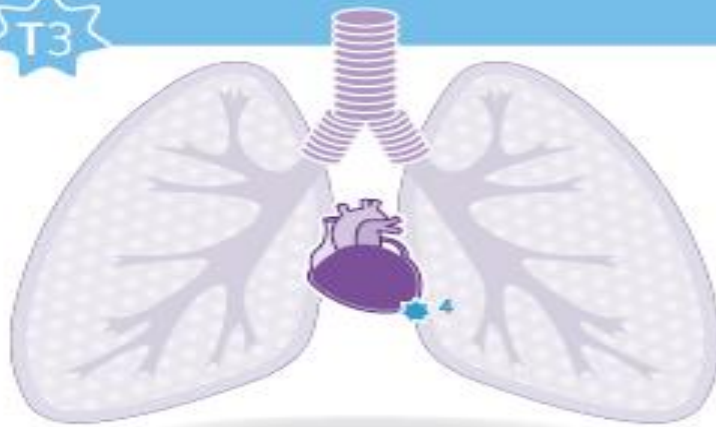
- Tumor $> 5\text{cm}$ but $\leq 7\text{cm}$

or ■ tumor of any size with separate tumor nodule(s) in the same lobe ①

or ■ one that directly invades any of the following structures: chest wall ② (including the parietal pleura and superior sulcus tumors) ③

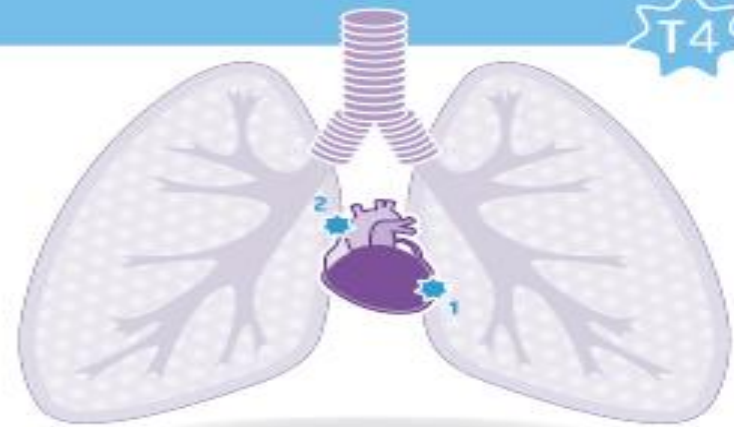


T3

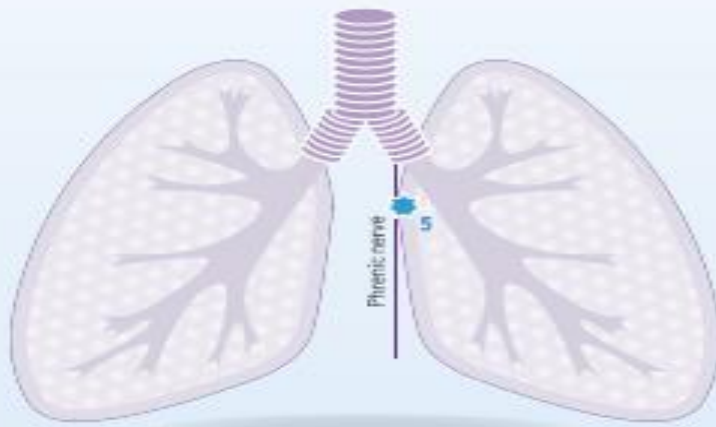


Parietal pericardium ④

T4



- Tumor > 7cm in greatest dimension
- Tumor of any size that invades any of the following:
 - Mediastinum
 - Heart ①
 - Great vessels
(i.e. aorta, superior vena cava, inferior vena cava, main pulmonary artery, intrapericardial portions of the right and left pulmonary artery, intrapericardial portions of the superior and inferior right and left pulmonary veins) ②

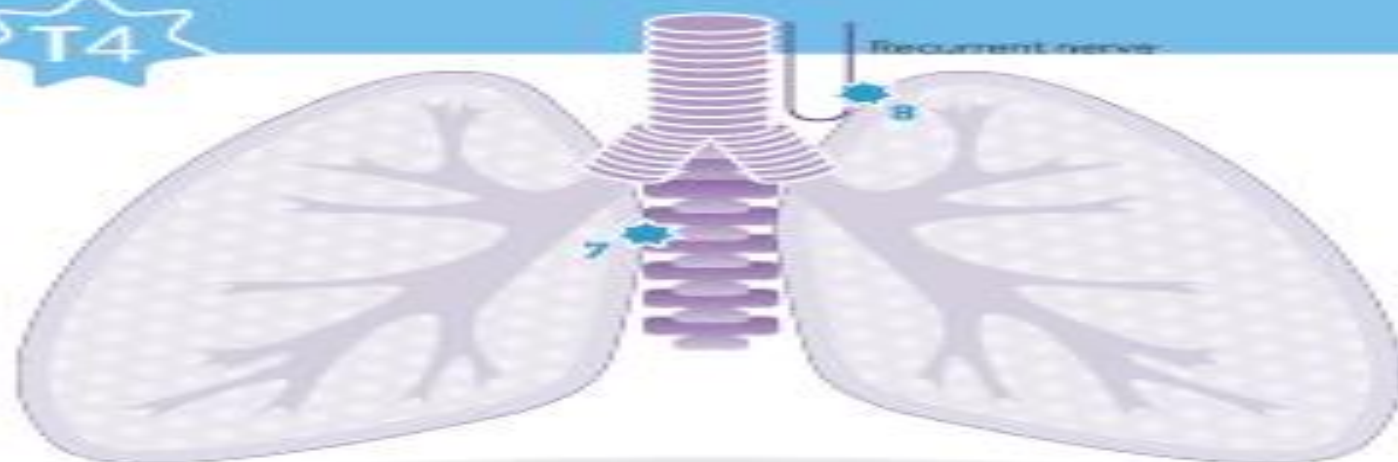


Phrenic nerve ⑤

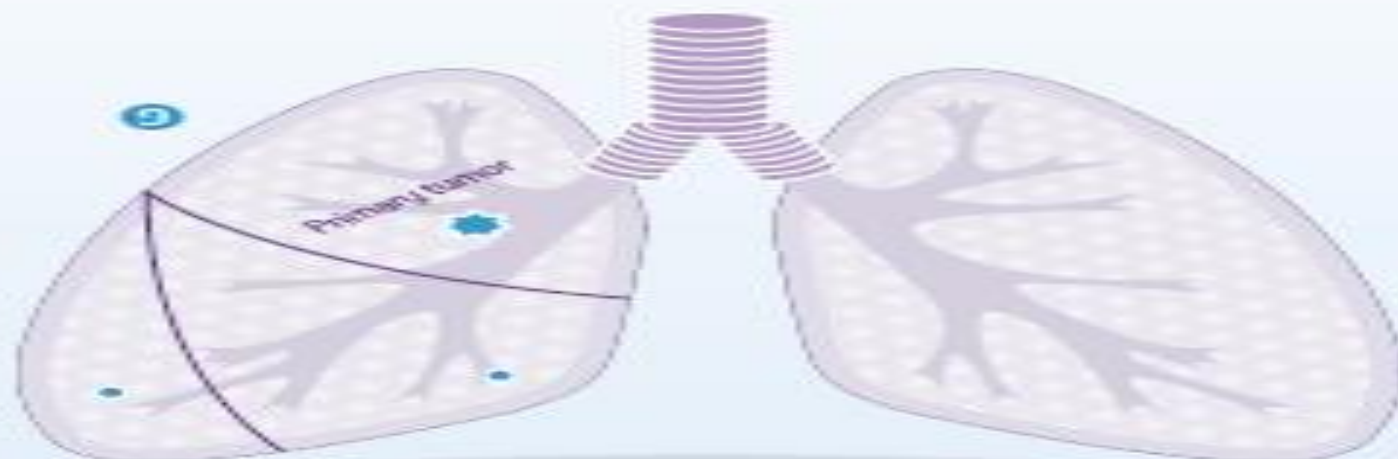


- Diaphragm ③
- Trachea ④
- Esophagus ⑤
- Carina ⑥

T4



- Vertebral body ⑦
- Recurrent laryngeal nerve ⑧



- Tumor of any size with separate tumor nodule(s) in a different ipsilateral lobe ⑨

The IASLC Lung Cancer Staging Project

Proposals for the Revisions of the T Descriptors in the Forthcoming Eighth Edition of the TNM Classification for Lung Cancer

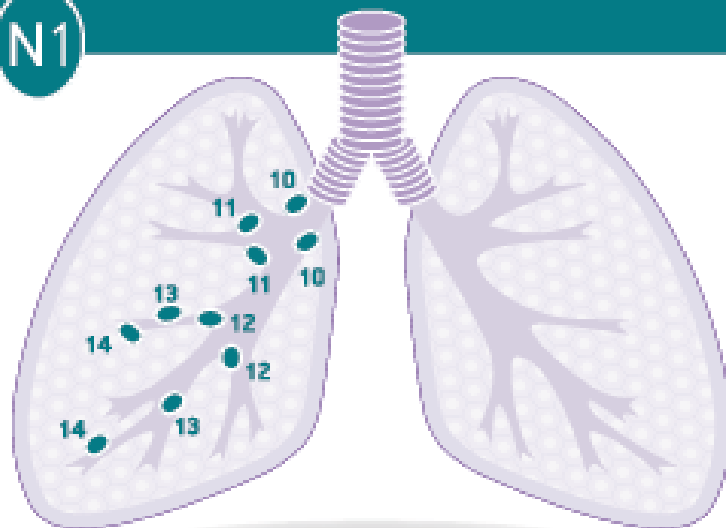
- Size: every cm counts
- Tumour size as descriptor in all T categories
- VPI: no change
- T2 & T3 endobronchial: same prognosis
- T2 & T3 atelectasis: same prognosis
- T3 diaphragm has a T4 prognosis
- T3 mediastinal pleura, rarely used

The IASLC Lung Cancer Staging Project

Proposals for the Revisions of the T Descriptors in the Forthcoming Eighth Edition of the TNM Classification for Lung Cancer

Descriptor	7th edition	Proposal for 8th edition
≤ 1 cm	T1a	T1a
> 1 - 2 cm	T1a	T1b
> 2 - 3 cm	T1b	T1c
> 3 - 4 cm	T2a	T2a
> 4 - 5 cm	T2a	T2b
> 5 - 7 cm	T2b	T3
> 7 cm	T3	T4
Bronchus < 2 cm	T3	T2
Complete atelectasis/pn	T3	T2
Diaphragm invasion	T3	T4
Mediastinal pleura	T3	-

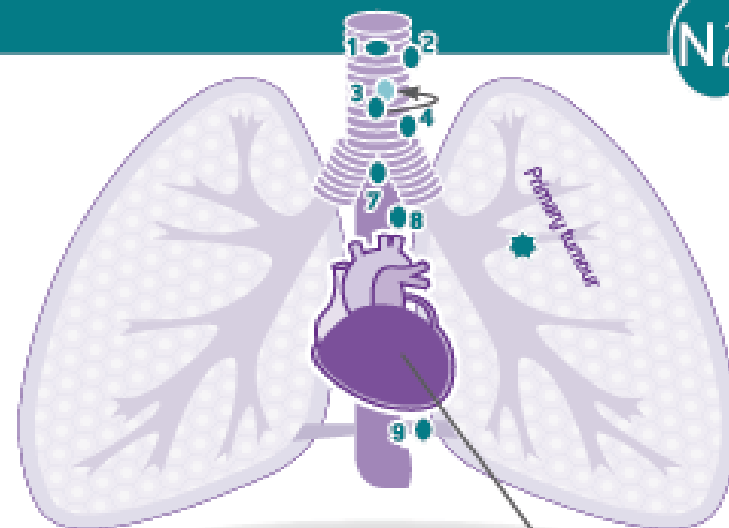
N1



Metastasis in:

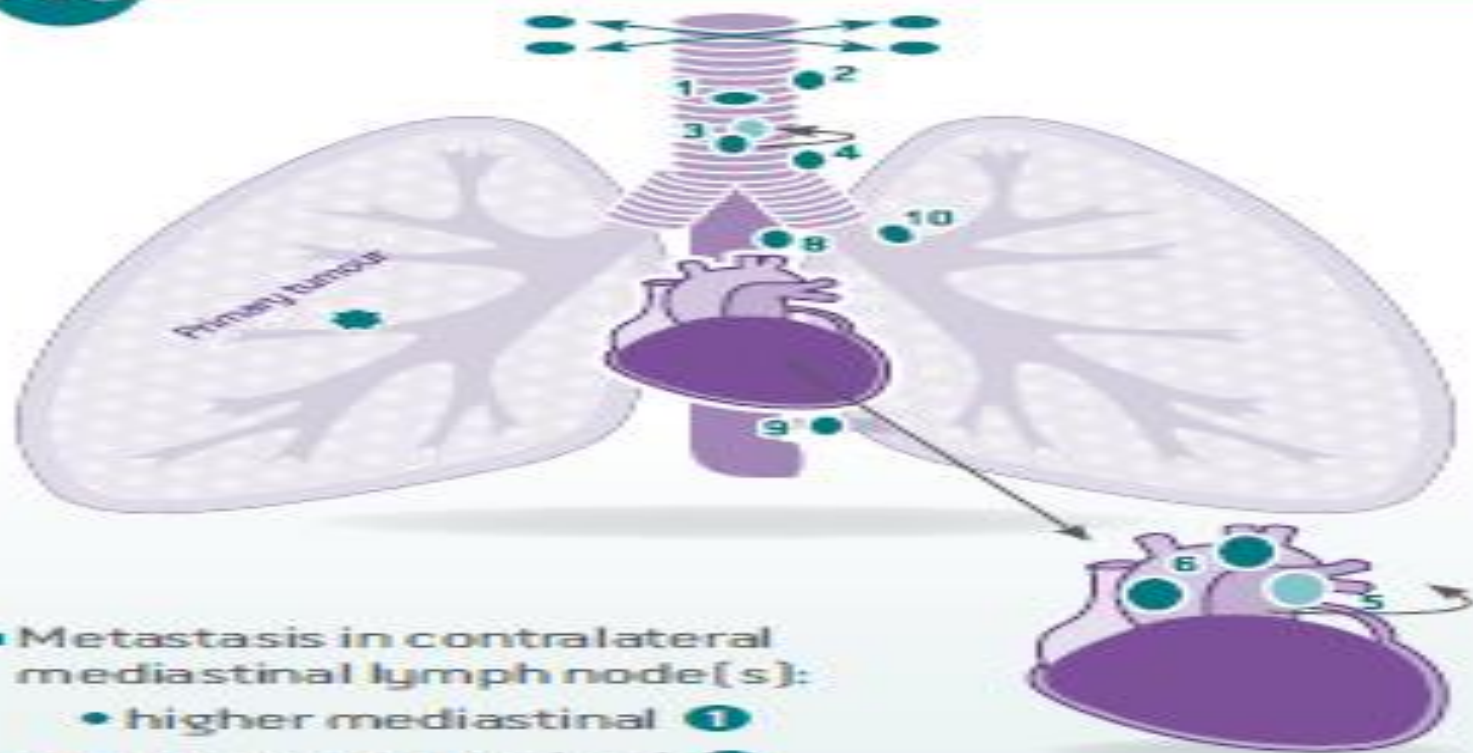
- Ipsilateral hilar lymph node(s) ⑩
- or ■ Ipsilateral interlobar lymph node(s) ⑪
- or ■ Ipsilateral intrapulmonary node(s)
(lobar ⑫, segmental ⑬, subsegmental ⑭)

N2



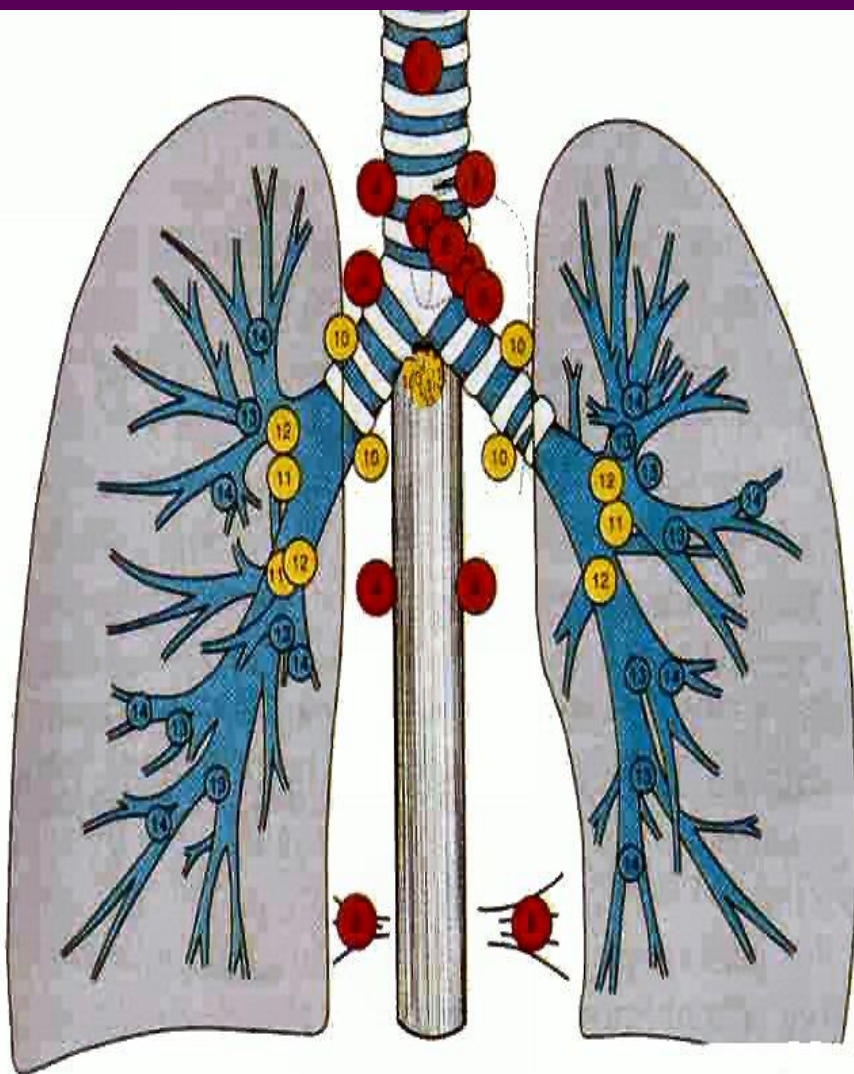
- Metastasis in ipsilateral mediastinal lymph node(s):
 - higher mediastinal ①
- or • upper paratracheal ②
- or • prevascular and retrotracheal ③
- or • lower paratracheal ④
(including azygos nodes)
- or • sub-aortic ⑤ (A-P window)
- or • para-aortic ⑥
(ascending aorta or phrenic)
- or • paraesophageal ⑧ (below carina)
- or • pulmonary ligament ⑨

and/or Subcarinal ⑦ lymph node(s)

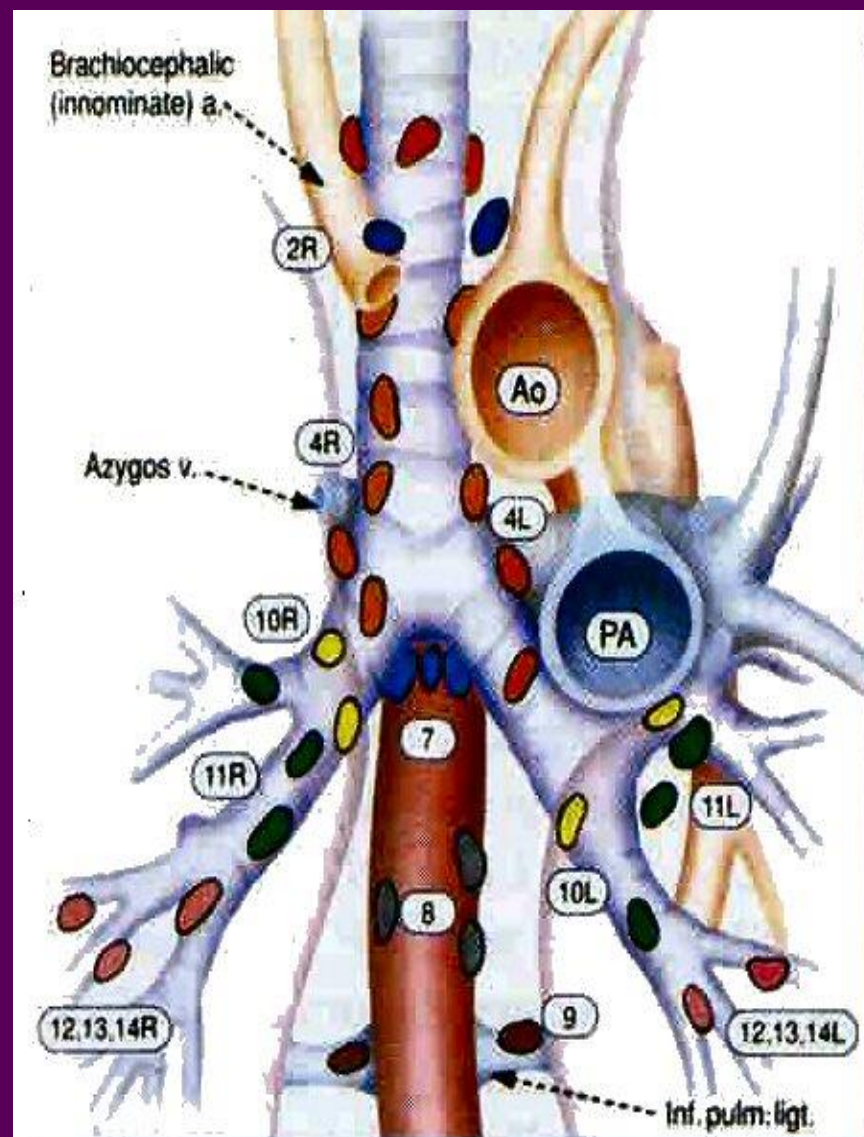


■ Metastasis in contralateral mediastinal lymph node(s):

- higher mediastinal ①
- or • upper paratracheal ②
- or • pre-vascular and retrotracheal ③
- or • lower paratracheal ④ (including azygos nodes)
- or • sub-aortic ⑤ (A-P window)
- or • para-aortic ⑥ (ascending aorta or phrenic)
- or • paraesophageal ⑧ (below carina)
- or • pulmonary ligament ⑨
- or • Metastasis to contralateral hilar ⑩ lymph node(s)
- or • Metastasis to ipsilateral or contralateral scalene or supraclavicular lymph node(s)



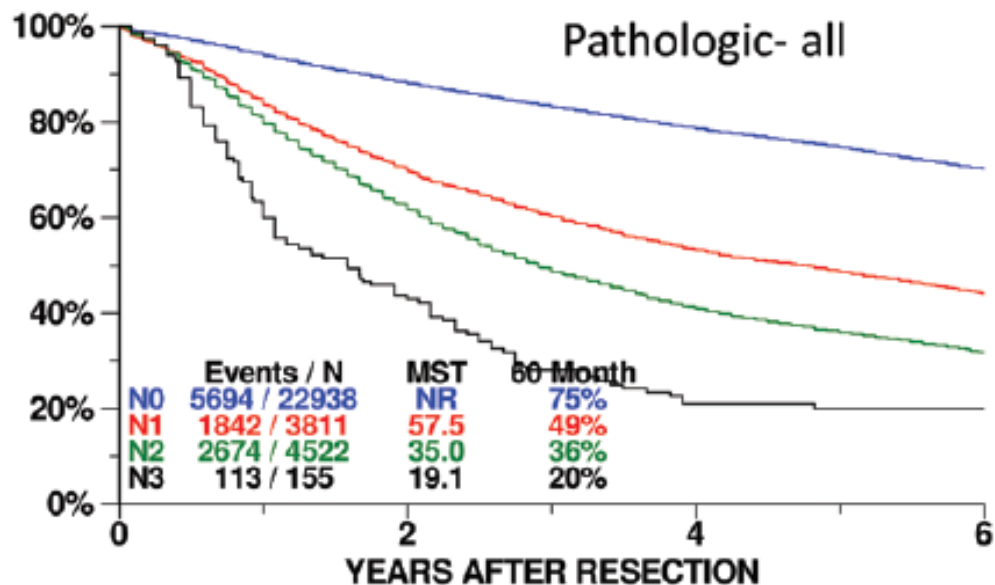
**NARUKE
LYMPH NODE MAP**



**MOUNTAIN-DRESLER
ATS-LYMPH NODE MAP**

The International Association for the Study of Lung Cancer Lung Cancer Staging Project

*Proposals for the Revision of the N Descriptors in the Forthcoming
8th Edition of the TNM Classification for Lung Cancer*

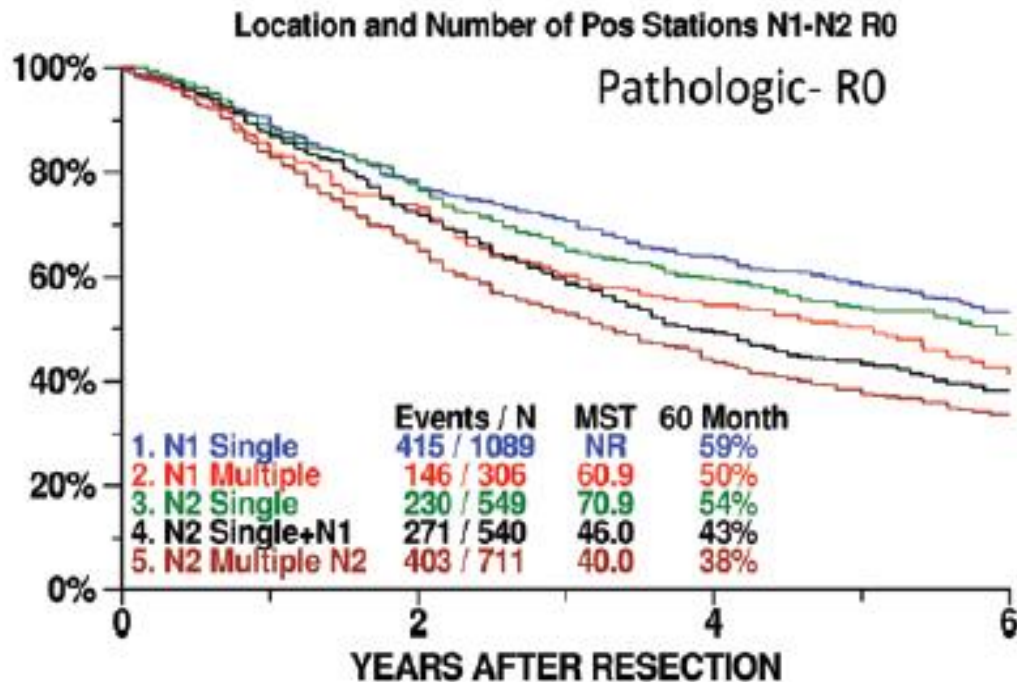


**N0 vs N1 vs N2 vs N3 Comparisons
Adjusted for Histology (adeno vs others),
Sex, Age 60+ , R0 resection, and Region.
(Cox PH regression on all cases)**

comparison	HR	P
N1 vs N0	2.10	<0.0001
N2 vs N1	1.63	<0.0001
N3 vs N2	1.66	<0.0001

The International Association for the Study of Lung Cancer
Lung Cancer Staging Project

*Proposals for the Revision of the N Descriptors in the Forthcoming
8th Edition of the TNM Classification for Lung Cancer*



- N1 Single = N1a
- N1 Multiple = N1b
- N2 Single N2 ("skip mets") = N2a1
- N2 Single N2 + N1 = N2a2
- N2 Multiple N2 = N2b

The International Association for the Study of Lung Cancer
Lung Cancer Staging Project

*Proposals for the Revision of the N Descriptors in the Forthcoming
8th Edition of the TNM Classification for Lung Cancer*

- 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

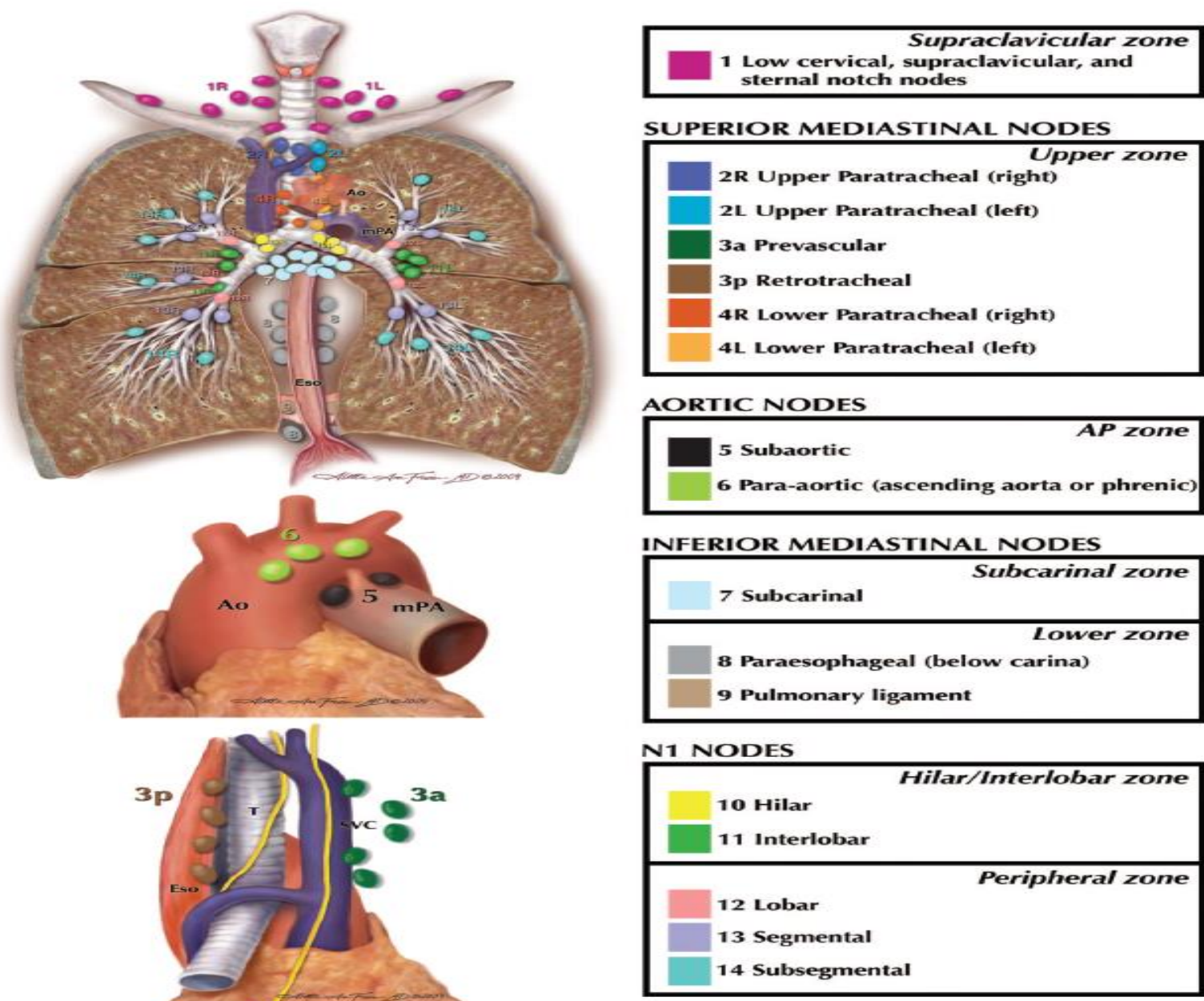
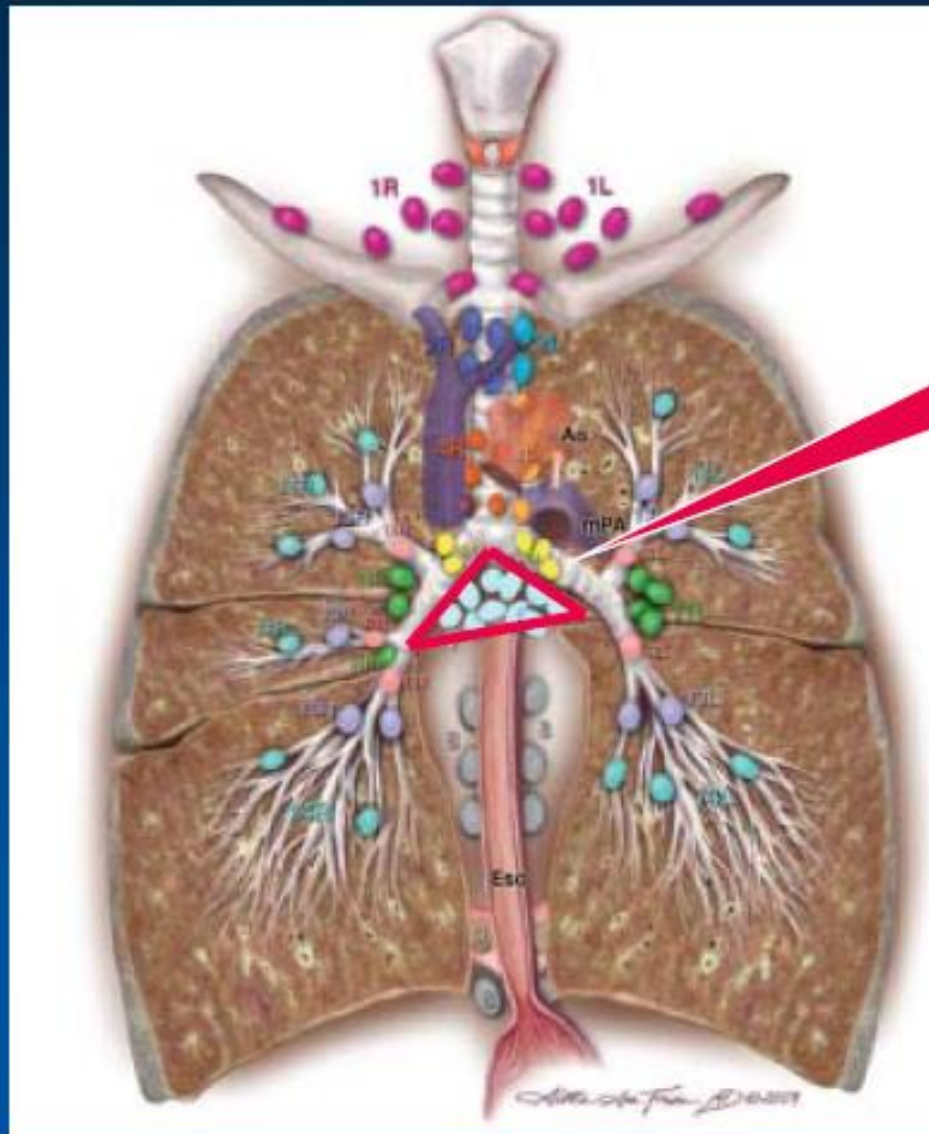


FIGURE 3. The International Association for the Study of Lung Cancer (IASLC) lymph node map, including the proposed grouping of lymph node stations into “zones” for the purposes of prognostic analyses.

The IASLC Lymph Node Map



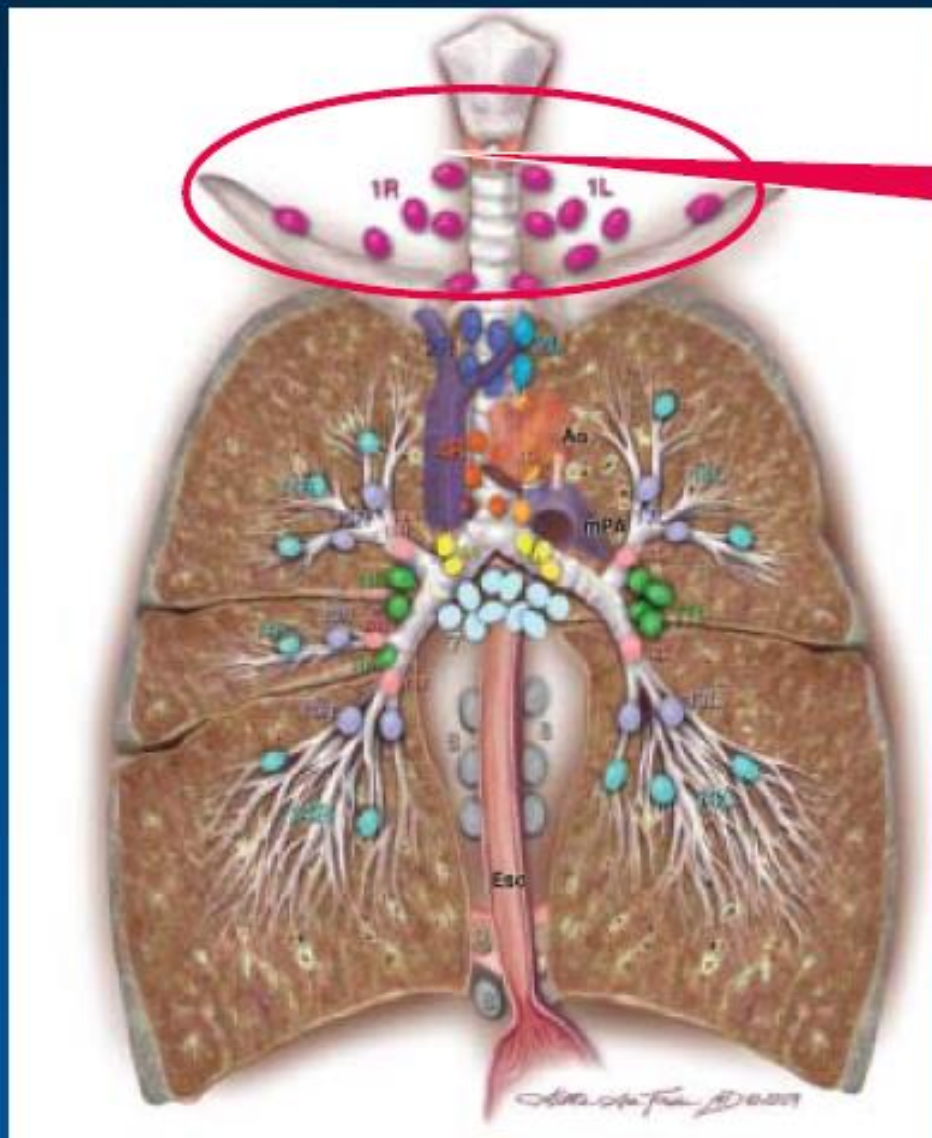
Enlargement of the subcarinal station

Upper border: the carina of the trachea

Lower border: the upper border of the lower lobe bronchus on the left; the lower border of the bronchus intermedius on the right

All these nodes are N2 if involved, regardless of the side of the tumour

The IASLC Lymph Node Map



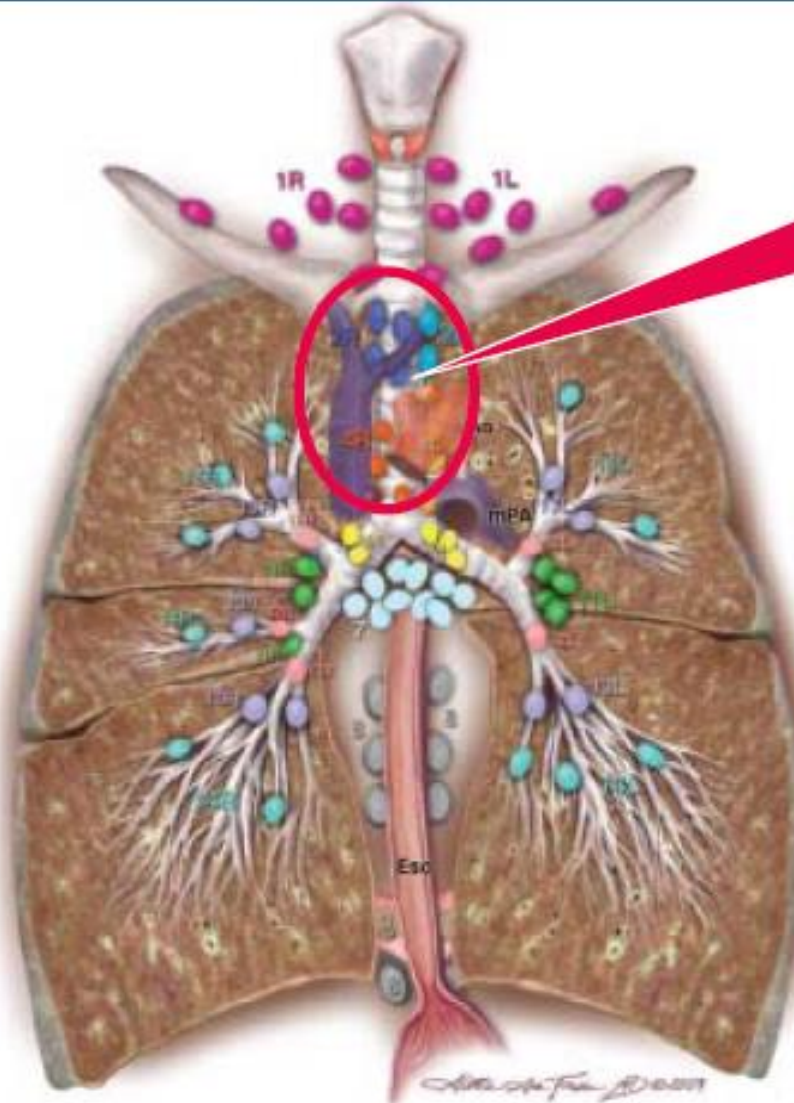
New supraclavicular zone

Upper border: lower margin of cricoid cartilage

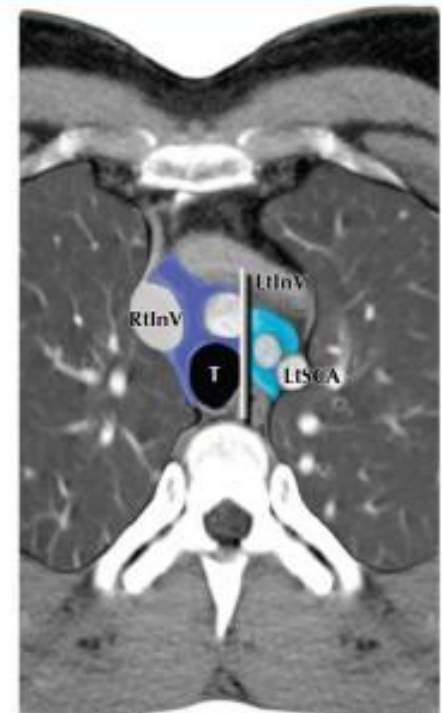
Lower border: clavicles bilaterally and, in the midline, the upper border of manubrium #L1 and #R1 limited by the midline of the trachea.

All these nodes are N3 if involved, regardless of the side of the tumour

The IASLC Lymph Node Map



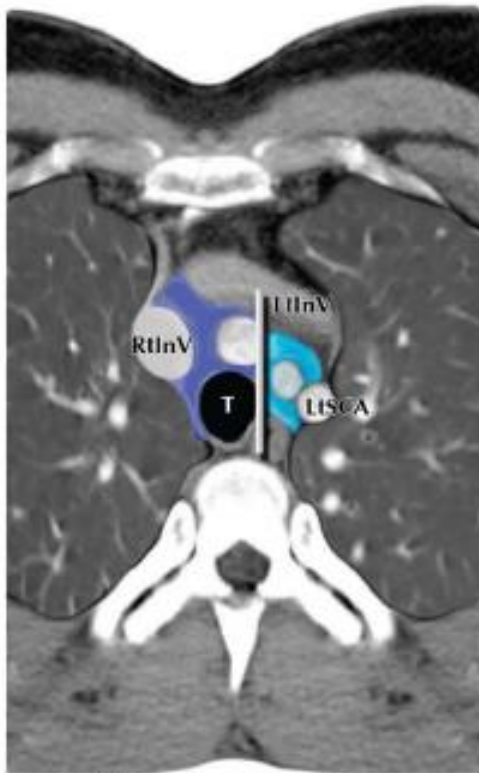
**Shift of the anatomic
midline to the
left paratracheal border**



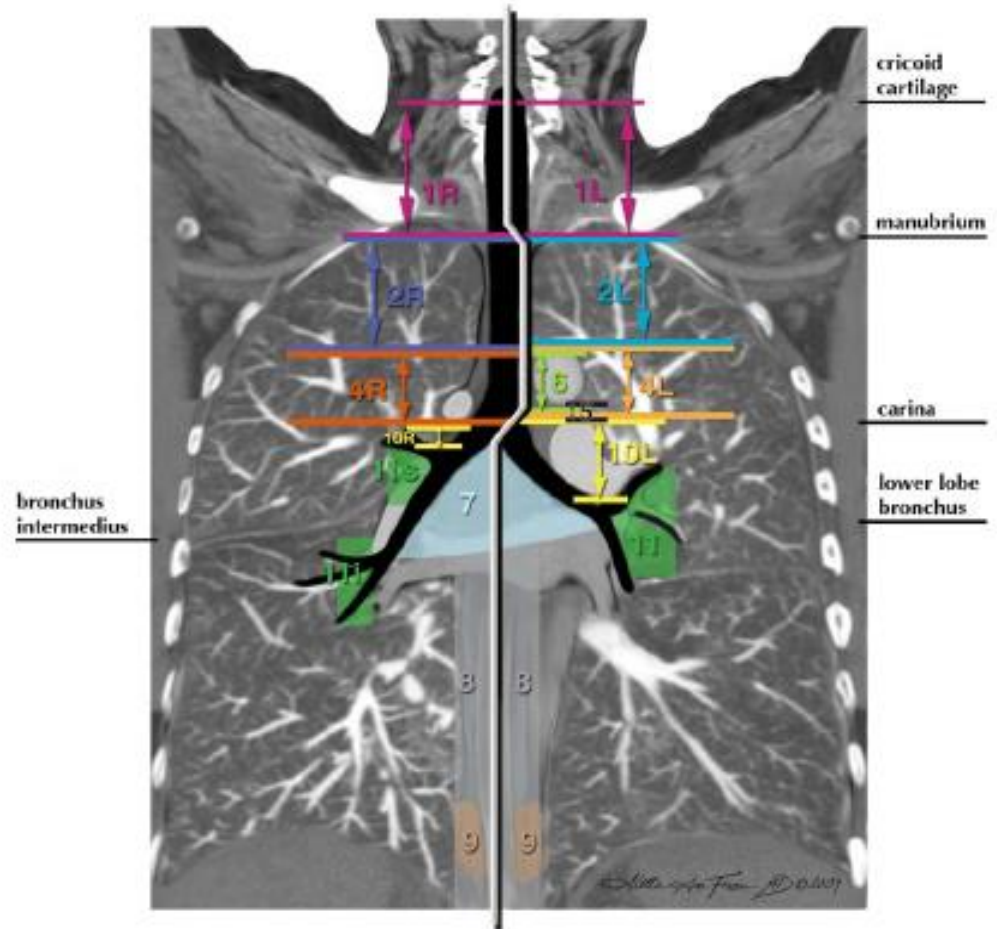
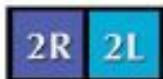
Alta Arc Frisco MD ©2008

CT Atlas

Axial #1



Alotta Ann Frazin MD ©2008



TNM Classification according to the IASLC Proposals, updated 2016

M

Distant Metastasis

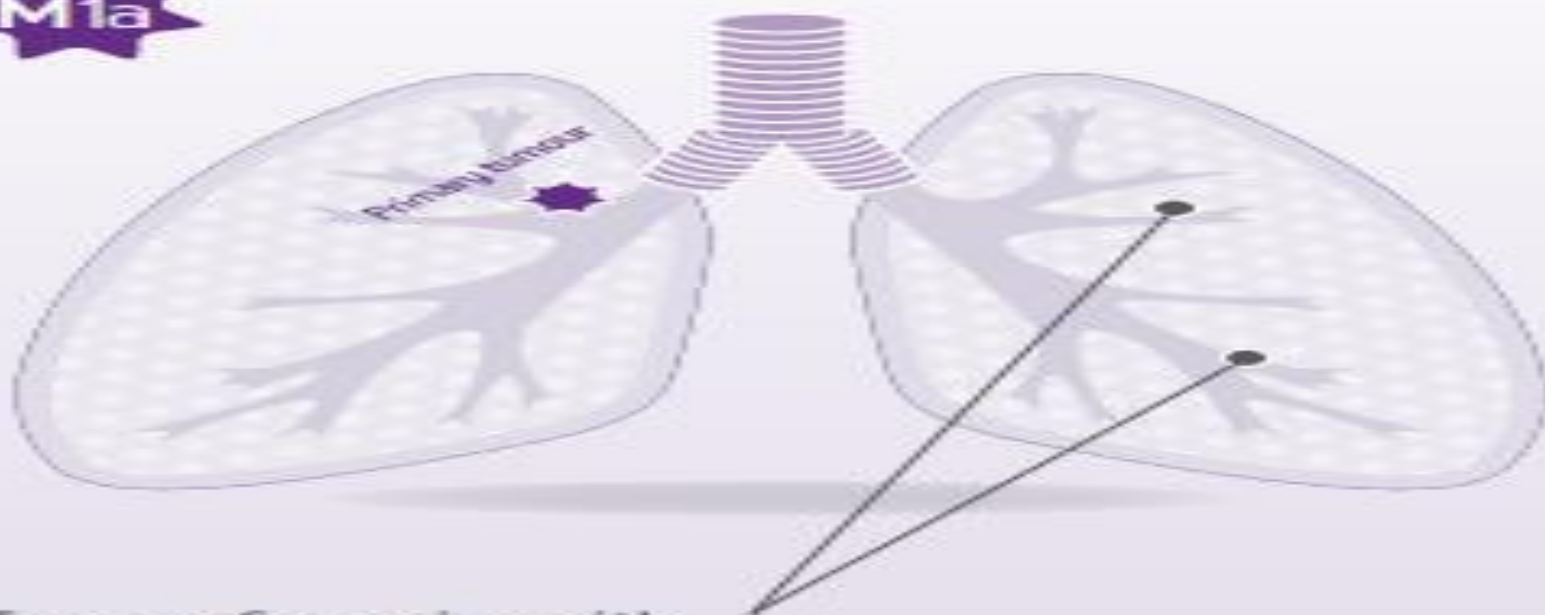
M0

No distant metastasis

M1

Distant metastasis present

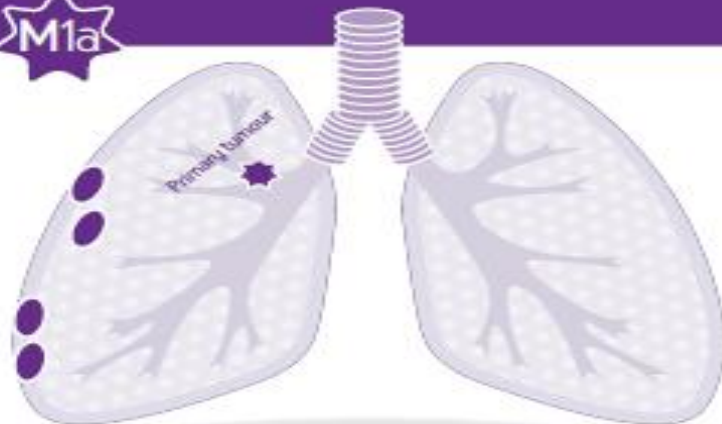
M1a



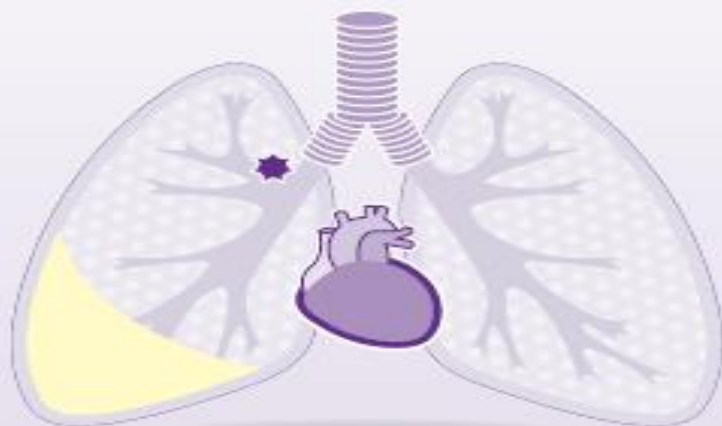
Tumor of any size with

- Separate tumor nodule(s) in a contralateral lobe

M1a



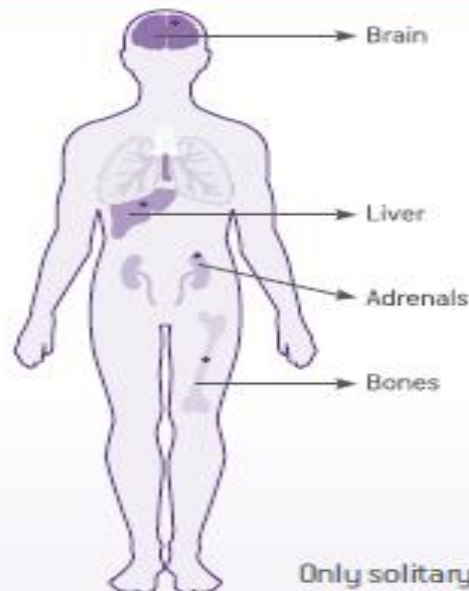
Tumor of any size with
 ■ Pleural or pericardial nodules



Tumor of any size with
 ■ Malignant pleural or pericardial effusion
 (if pleural or pericardial effusion is negative for tumor cells, non bloody, non exudative, and clinical judgment dictate that the effusion is not related to the tumor, ignore the effusion)

Single extrathoracic metastasis

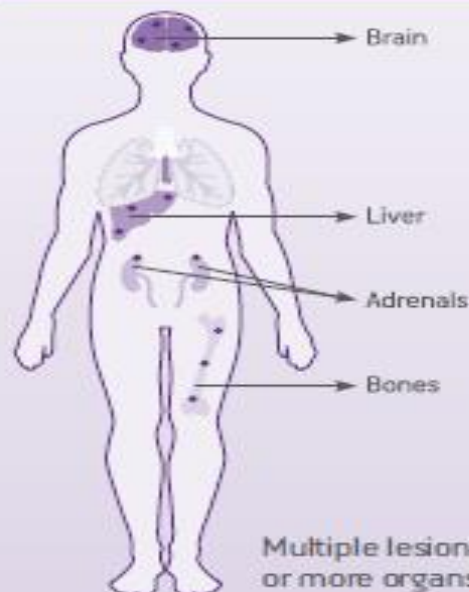
M1b



Only solitary lesion in one organ

Multiple extrathoracic metastases
 in one or more organs

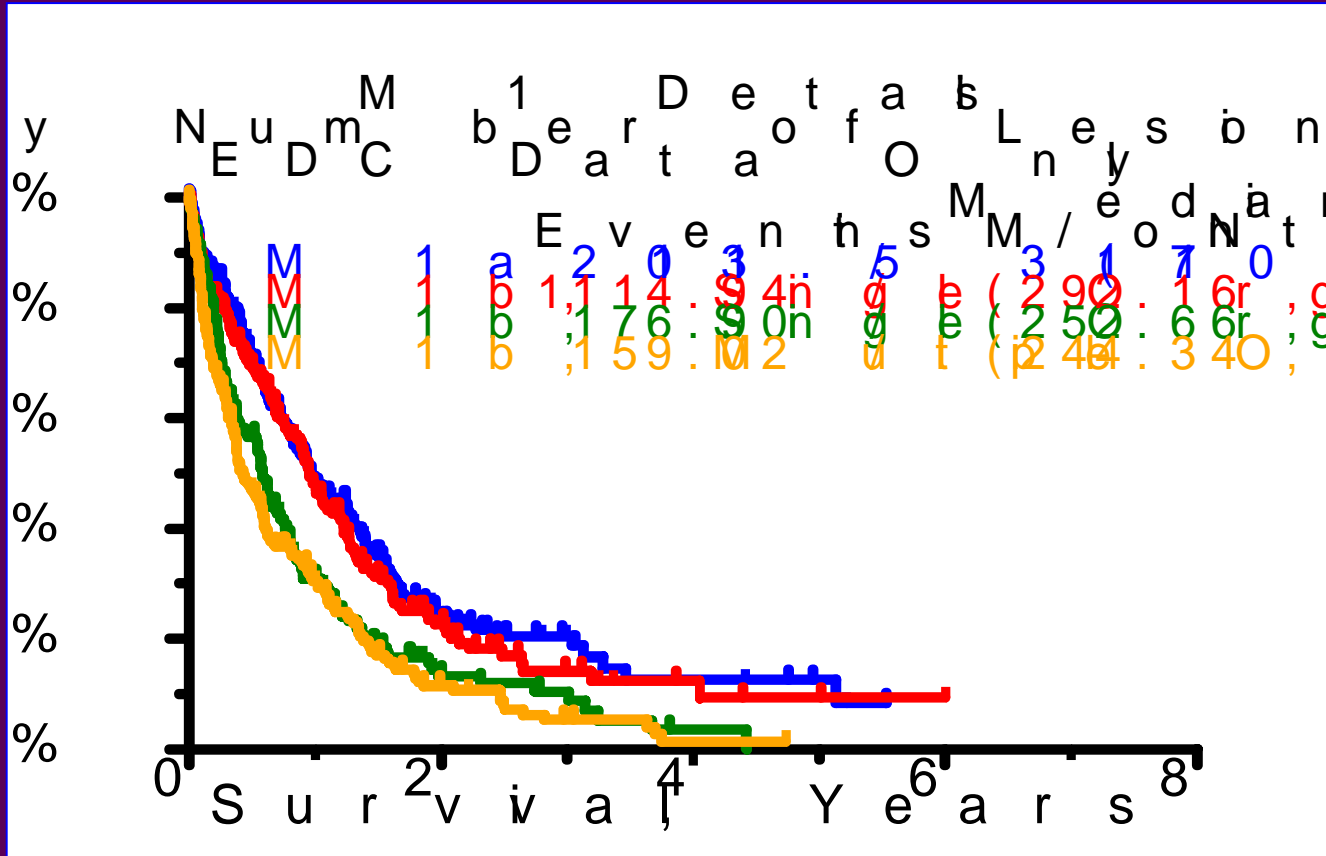
M1c



Multiple lesions in one or more organs

The IASLC Lung Cancer Staging Project

Proposals for the Revision of the M Descriptors in the Forthcoming Eighth Edition of the TNM Classification of Lung Cancer

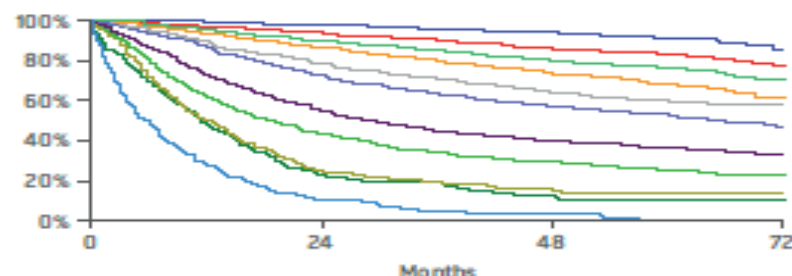


	N0	N1	N2	N3	M1a any N	M1b any N	M1c any N
T1a	IA1	IIB	IIIA	IIIB	IVA	IVA	IVB
T1b	IA2	IIB	IIIA	IIIB	IVA	IVA	IVB
T1c	IA3	IIB	IIIA	IIIB	IVA	IVA	IVB
T2a	IB	IIB	IIIA	IIIB	IVA	IVA	IVB
T2b	IIA	IIB	IIIA	IIIB	IVA	IVA	IVB
T3	IIB	IIIA	IIIB	IIIC	IVA	IVA	IVB
T4	IIIA	IIIA	IIIB	IIIC	IVA	IVA	IVB

Proposals for stage groupings

Clinical Staging

	MST	24 months	60 months
IA1	NR*	97%	92%
IA2	NR*	94%	83%
IA3	NR*	90%	77%
IB	NR*	87%	68%
IIA	NR*	79%	60%
IIB	66.0	72%	53%
IIIA	29.3	55%	36%
IIIB	19.0	44%	26%
IIIC	12.6	24%	13%
IVA	11.5	23%	10%
IVB	6.0	10%	0%



Overall survival expressed as median survival time (MST), 2-year and 5-year survival by clinical stage using the proposed International Association for the Study of Lung Cancer recommendations

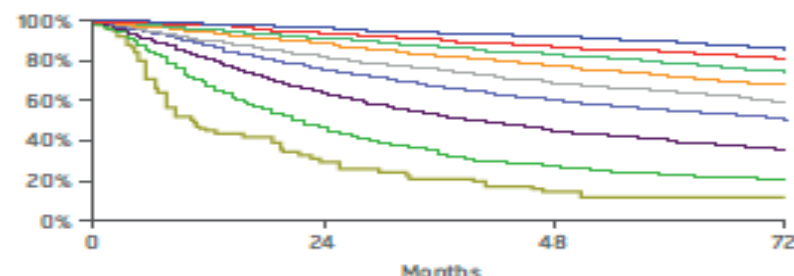
Goldstraw P et al. J Thorac Oncol 2016; 11,39-51.

* NR= Not Reached

Proposals for stage groupings

Pathological Staging

	MST	24 months	60 months
IA1	NR*	97%	90%
IA2	NR*	94%	85%
IA3	NR*	92%	80%
IB	NR*	89%	73%
IIA	NR*	82%	65%
IIB	NR*	76%	56%
IIIA	41.9	65%	41%
IIIB	22.0	47%	24%
IIIC	11.0	30%	12%



Overall survival expressed as median survival time (MST), 2-year and 5-year survival by pathologic stage using the proposed International Association for the Study of Lung Cancer recommendations

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

* NR= Not Reached

Take Home Message

- More relevance to tumor size
- Reclassification of some T descriptors
- Validation of present N descriptors
- Acknowledgement of relevance of quantification of nodal disease
- Three metastatic groups
- More stages for better prognostic stratification

Μειονεκτήματα νεώτερης σταδιοποίησης

- Μη ειδικά σχεδιασμένη βάση δεδομένων για αξιολόγηση TNM σταδιοποίησης
- Χωρίς παγκόσμια κάλυψη
- EGFR Status?
- Global Lymph Node Map by IASLC
- Επέκταση της νόσου πέραν της κάψας των λεμφαδένων (the presence of cancer cells beyond the capsule of the involved nodes)
- Λεμφαγγειακή καρκινωμάτωση?
- GGO?
- PET-CT (improved accuracy of staging, prognostic value?)

Should the 7th Edition of the Lung Cancer Stage Classification System Change Treatment Algorithms in Non-small Cell Lung Cancer?

Daniel J. Boffa, MD, Frank C. Detterbeck, MD,* Erica J. Smith, MPH,† Ramon Rami-Porta, MD,‡
John Crowley, PhD,§ Daniel Zelterman, PhD,¶ Lynn Tanoue, MD,|| Anthony W. Kim, MD,*
and Peter Goldstraw, MB, FRCS***

Conclusions: The perception that a stage change should lead to a change in management exists. The revision of the lung cancer staging system does not provide any direct information to indicate the superiority of one treatment approach over another. Assuming that overall prognosis of a subgroup is strongly linked to a specific treatment and that a particular outcome, therefore, warrants a change in treatment is not justified. Thus, making changes in management solely in response to upstaging or downstaging in the new stage classification system is not justified.

TNM Classification according
to the IASLC Proposals,
updated 2016

	No	N1	N2	N3	M 1a-1b any N	M 1c any N
T1a	IA1	IIb	IIIA	IIIB	IVA	IVB
T1b	IA2	IIb	IIIA	IIIB	IVA	IVB
T1c	IA3	IIb	IIIA	IIIB	IVA	IVB
T2a	IB	IIb	IIIA	IIIB	IVA	IVB
T2b	IIA	IIb	IIIA	IIIB	IVA	IVB
T3	IIb	IIIA	IIIB	IIIC	IVA	IVB
T4	IIIA	IIIA	IIIB	IIIC	IVA	IVB

*"..Not everything that
counts can be counted*

and

*not everything that can be
counted counts.."*

Albert Einstein