

# Il mesotelioma



La ricerca attiva  
delle malattie  
lavoro-correlate



**Venerdì 17 novembre 2017**  
ore 8.45/17.00  
Sala di Rappresentanza ATS Brescia  
Viale Duca degli Abruzzi, 15

## Il ruolo dell'imaging radiologico nel mesotelioma

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# Mesotelioma Pleurico Maligno (MPM)

- Rara neoplasia maligna che origina dalla pleura
- Forte correlazione con esposizione all'asbesto (40-80%)
- L'incidenza di MPM in persone esposte è del 10%
- Può invadere sia la pleura viscerale che parietale e le strutture adiacenti (*parete toracica, mediastino, diaframma*)
- Prognosi → *mediana di sopravvivenza di 9-17 mesi dalla diagnosi*
  - Infiltrazione diffusa della pleura
  - Infiltrazione strutture adiacenti
  - Adenopatie mediastiniche
  - Metastasi a distanza

# Diagnosi

Indagini  
cito-  
istologiche



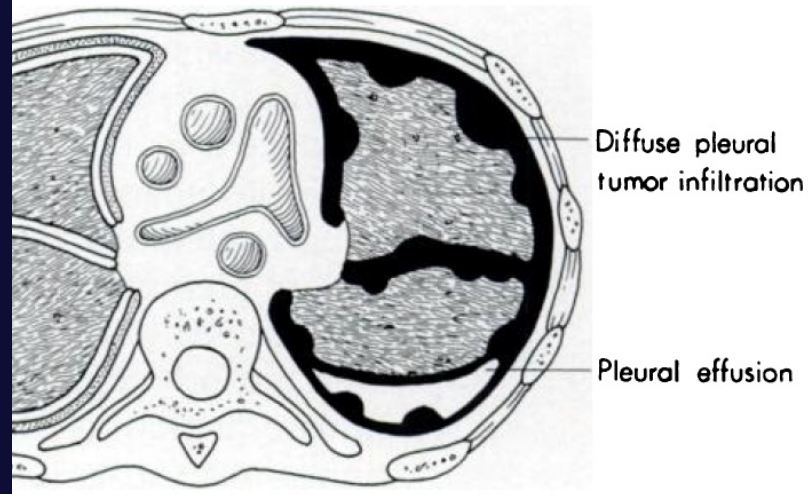
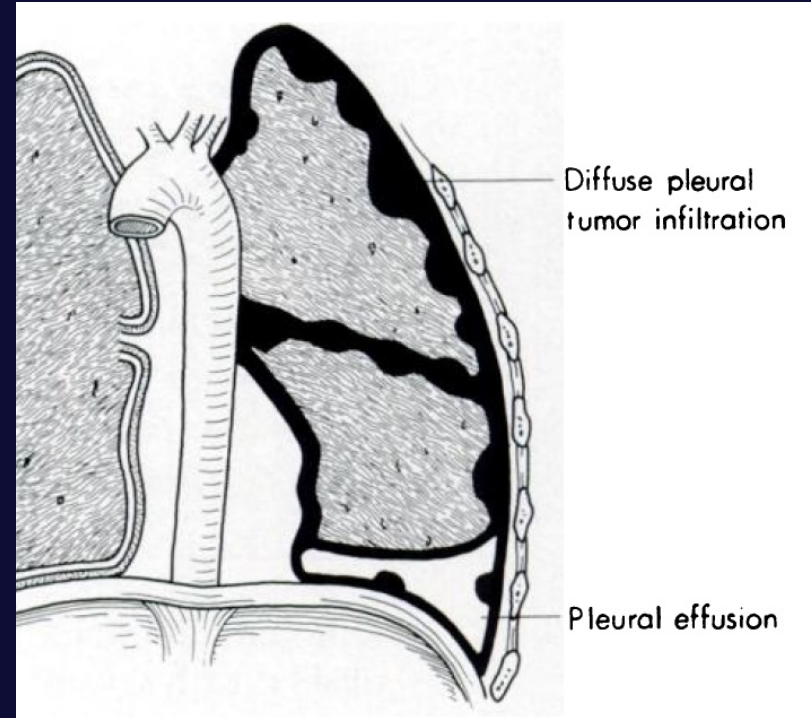
Anamnesi  
lavorativa



Valutazione  
clinica



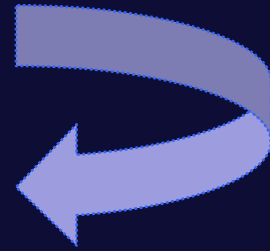
Imaging  
radiologico



# Mesotelioma Pleurico Maligno

## *Ruolo dell'imaging radiologico*

- Diagnosi
- Stadiazione (TNM)
- Approccio Terapeutico
- Follow-up



# DIAGNOSI - STADIAZIONE

*Quale tecnica di imaging utilizzare?*

- Radiogramma del Torace
- Tomografia Computerizzata (TC)
- Risonanza Magnetica (RM)
- PET-TC

# Mesotelioma Pleurico Maligno

## *Radiogramma del Torace*

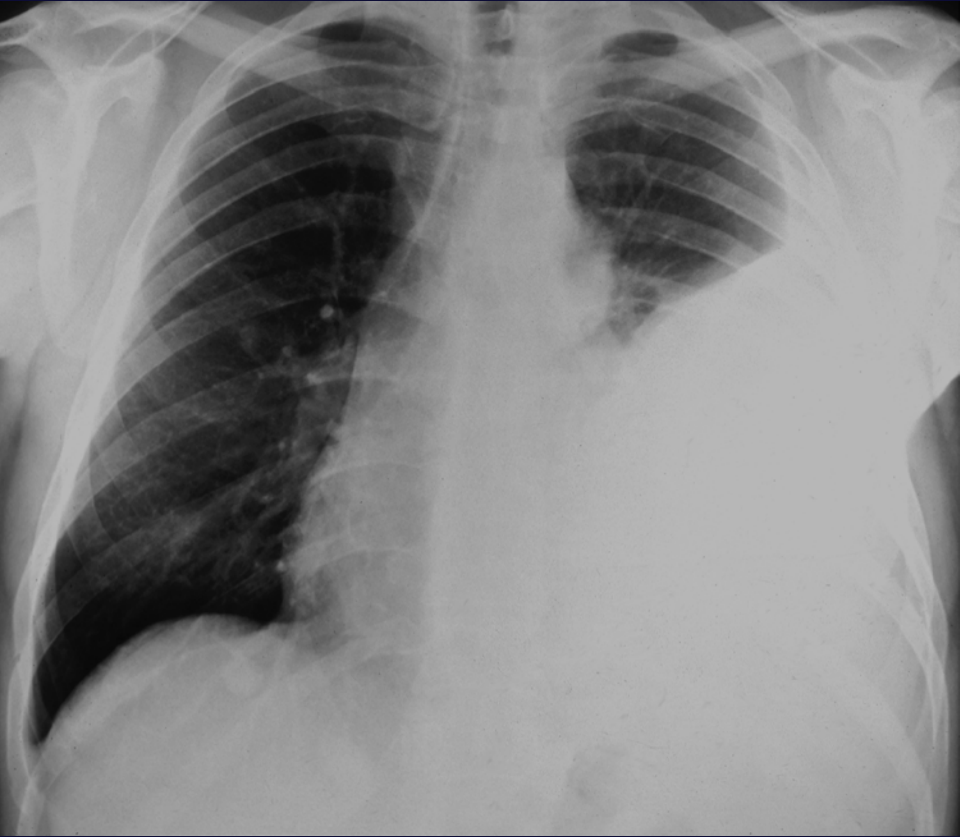
- Versamento pleurico monolaterale (30-80%)
- Ispessimento pleurico (60%)
- Placche e/o noduli pleurici (45-60%)
- Retrazione dell'emitorace

Chest x-ray is usually the first-line radiologic examination, but the radiographic findings are nonspecific

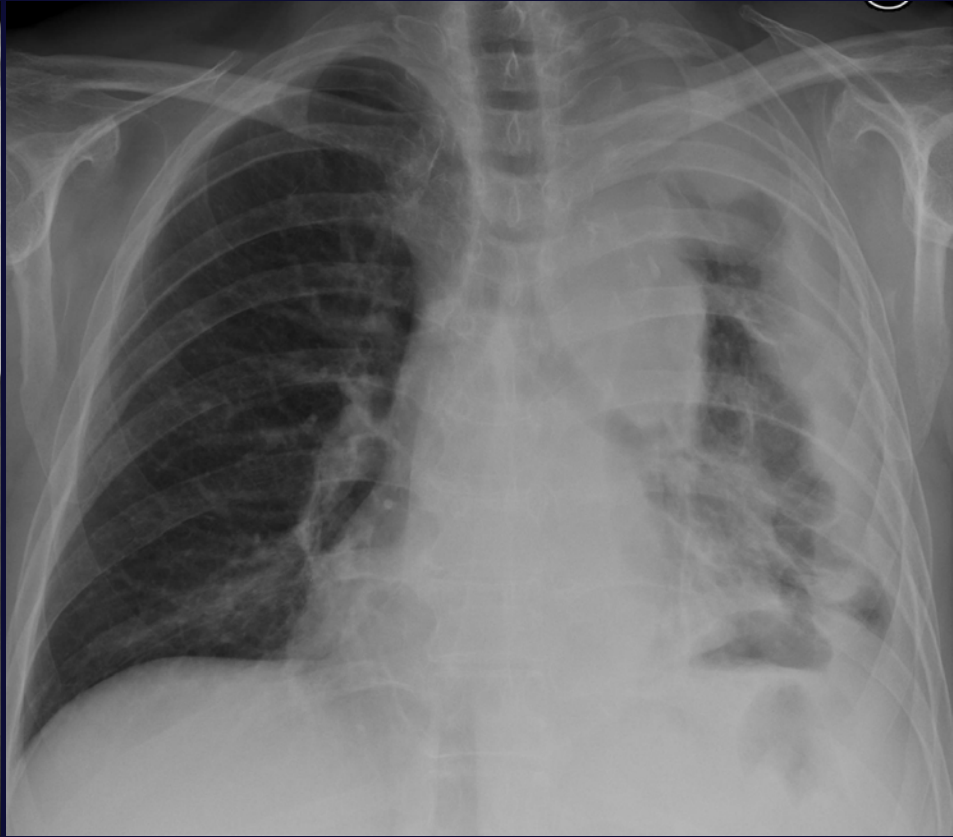
*Cardinale et al Acta Biomed 2017;*  
*Nickell LT jr et al Radiographics 2014*

# Mesotelioma Pleurico Maligno

## *Radiogramma del Torace*



*Versamento pleurico dx*



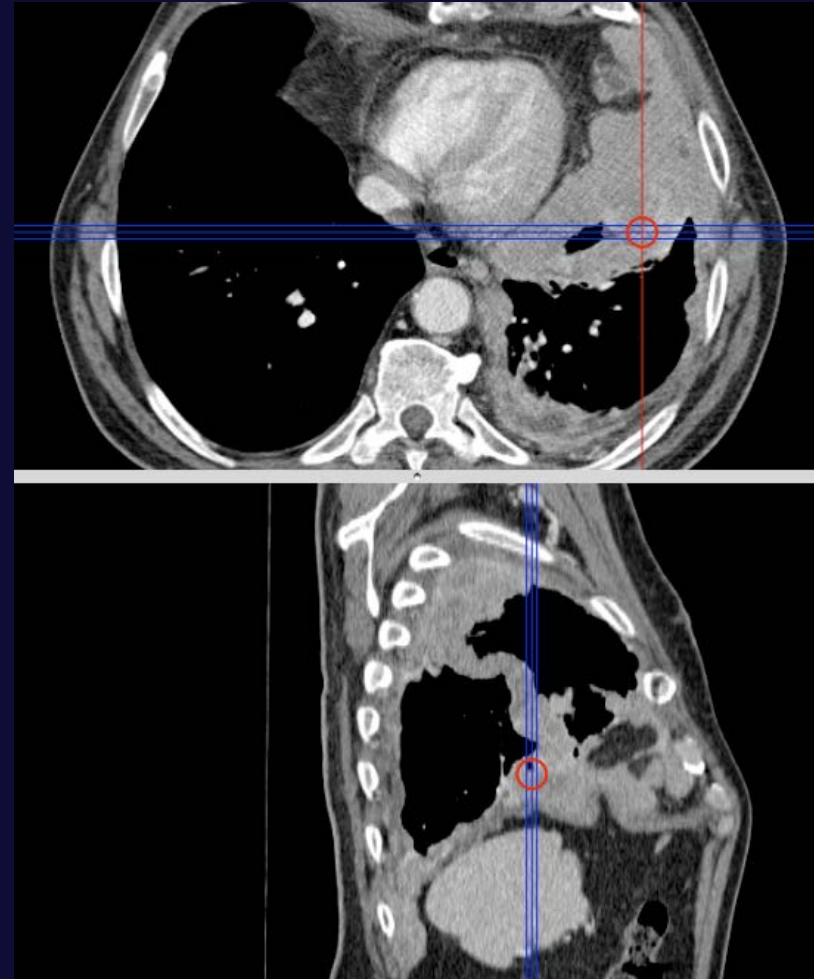
*Retrazione dell'emitorace sin  
Ispessimento pleurico omolaterale*

# Mesotelioma Pleurico Maligno

## *Contrast enhanced CT (CECT)*

Imaging modality of choice to evaluate MPM

- extent of primary tumor
- local invasion
- intrathoracic lymphadenopathy
- extrathoracic spread.



Chest CT alone is often sufficient for disease staging and treatment planning.

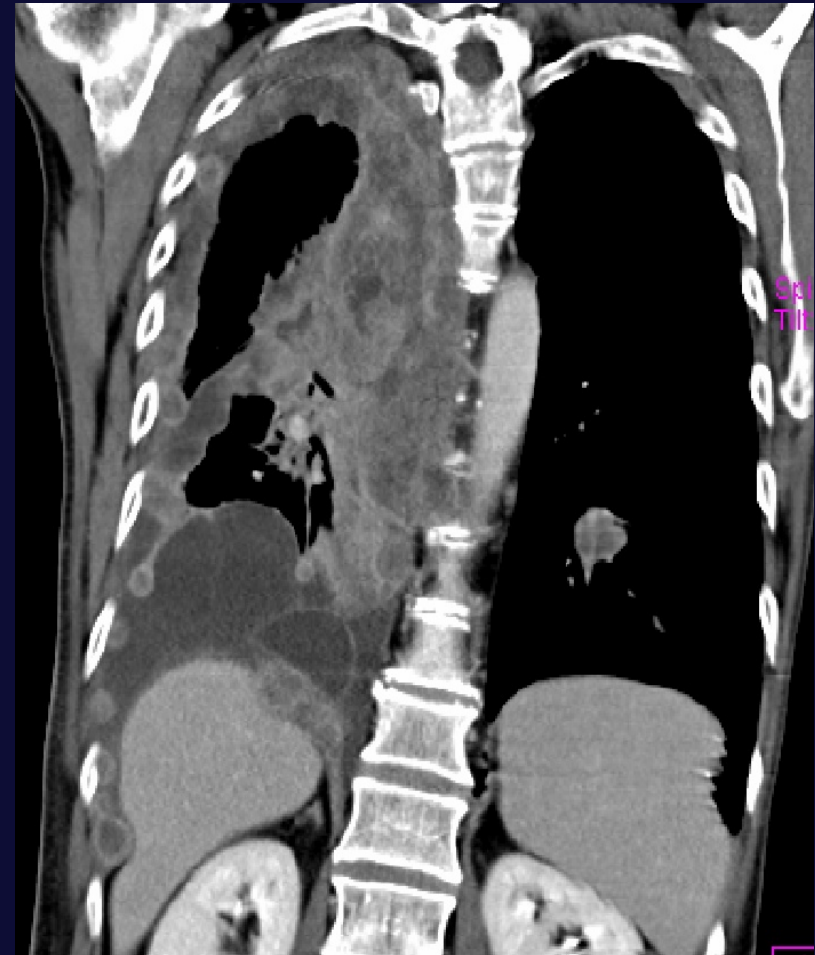


# Mesotelioma Pleurico Maligno

## *Contrast enhanced CT (CECT)*

The most common imaging manifestations of MPM

- Pleural effusion
- Pleural thickening
- Ipsilateral volume loss
- Local invasion
- Lymphadenopathy
- Metastatic disease



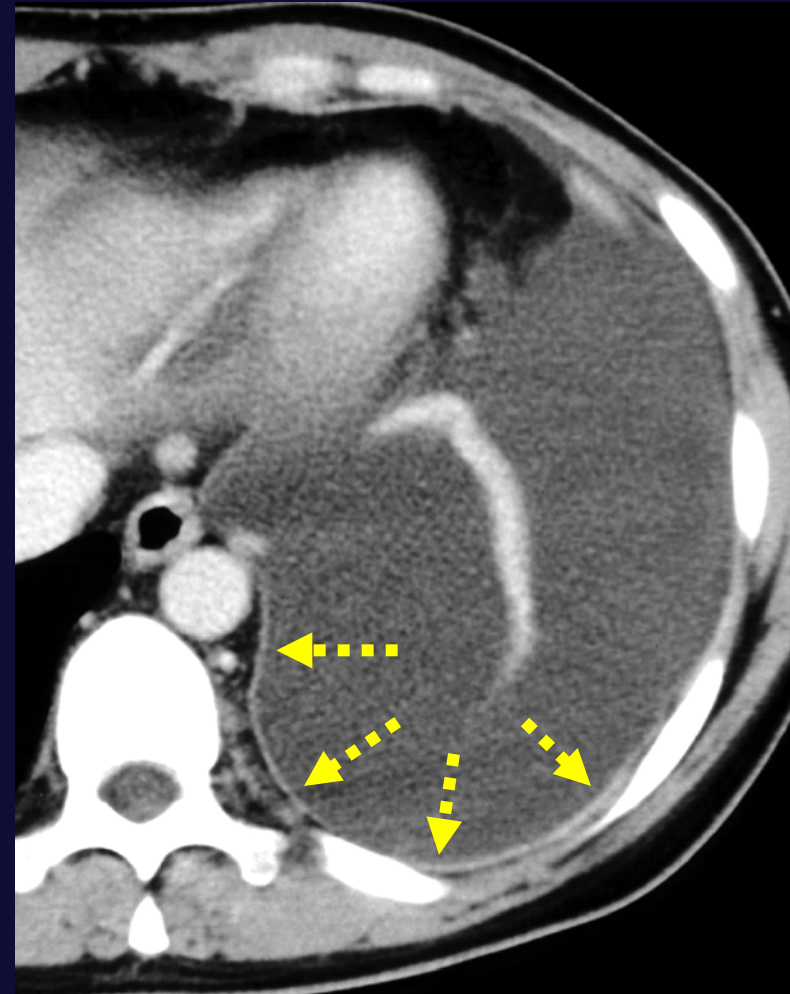
*\*\*Asbestos-related pleural disease*

# Mesotelioma Pleurico Maligno

## *Contrast enhanced CT (CECT)*

### CT sign suggestive of MPM

- Unilateral pleural effusion (74%)
- Circumferential pleural thickening (94%)
- Mediastinal pleural thickening (70%)
- Fissural pleural thickening (84%)
- Pleural thickening >1cm (72%)

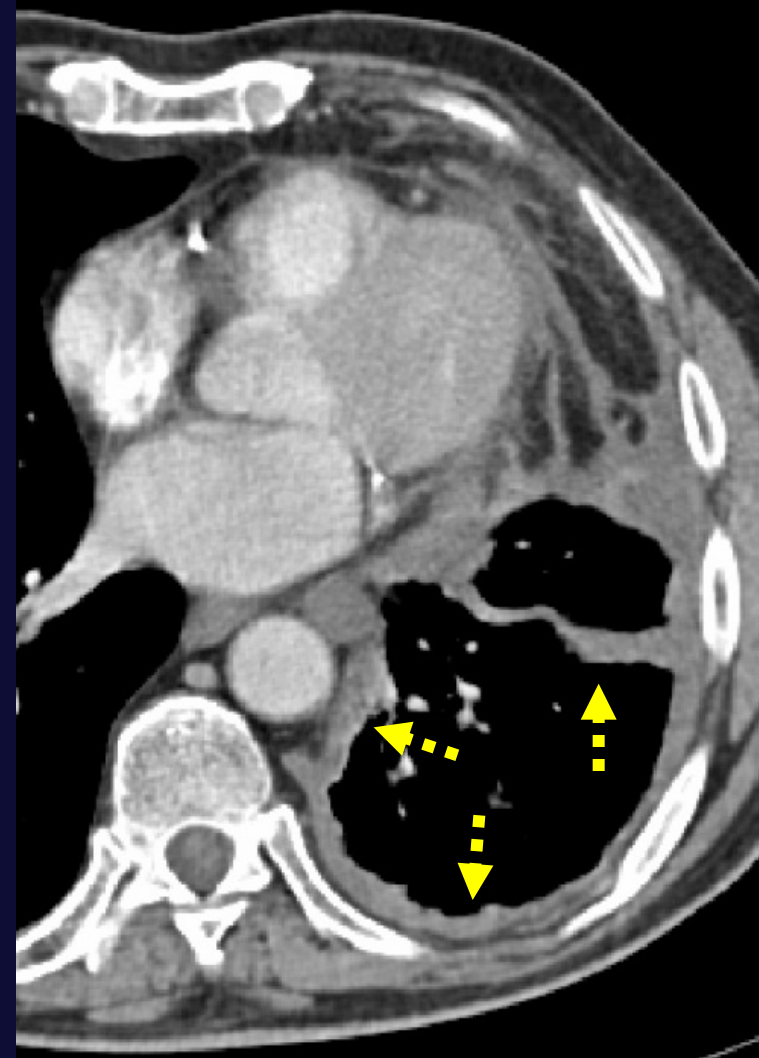


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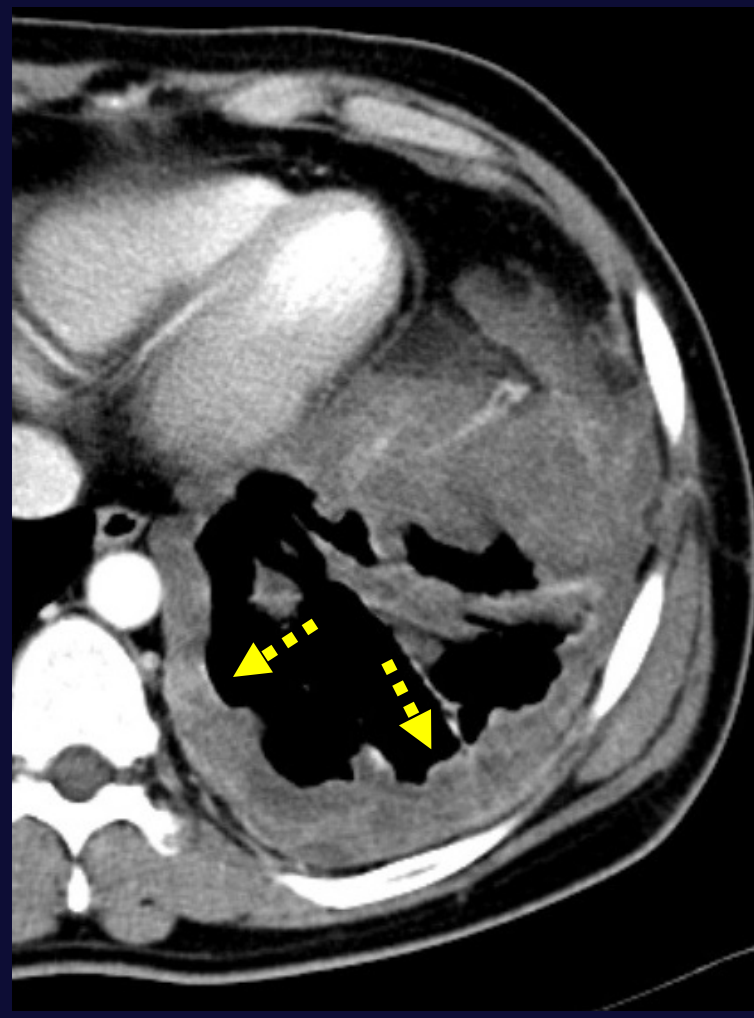
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Pleural thickening that is >1 cm in thickness is highly suggestive of MPM

*Nickell LT jr et al Radiographics 2014*



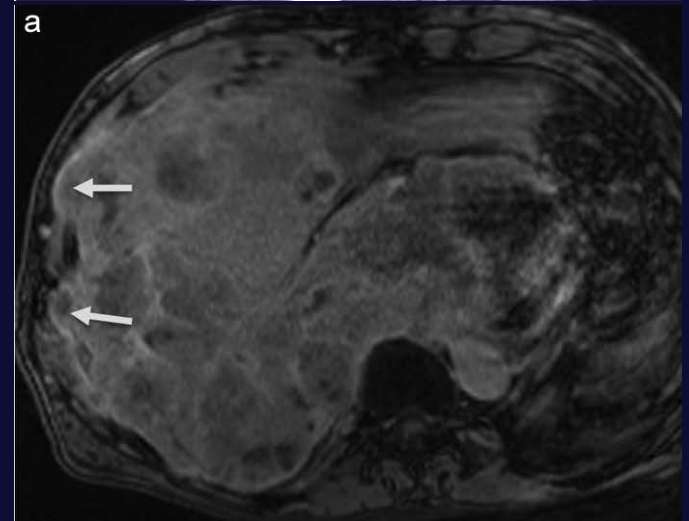
# Mesotelioma Pleurico Maligno

## *Magnetic Resonance Imaging (MRI)*

The greatest advantage of MRI is its greater sensitivity than CT

- chest wall invasion (69 vs 42%)
- diaphragm invasion (82 vs 55%)
- mediastinum invasion
- pericardium invasion

MR imaging is not routinely used to evaluate MPM

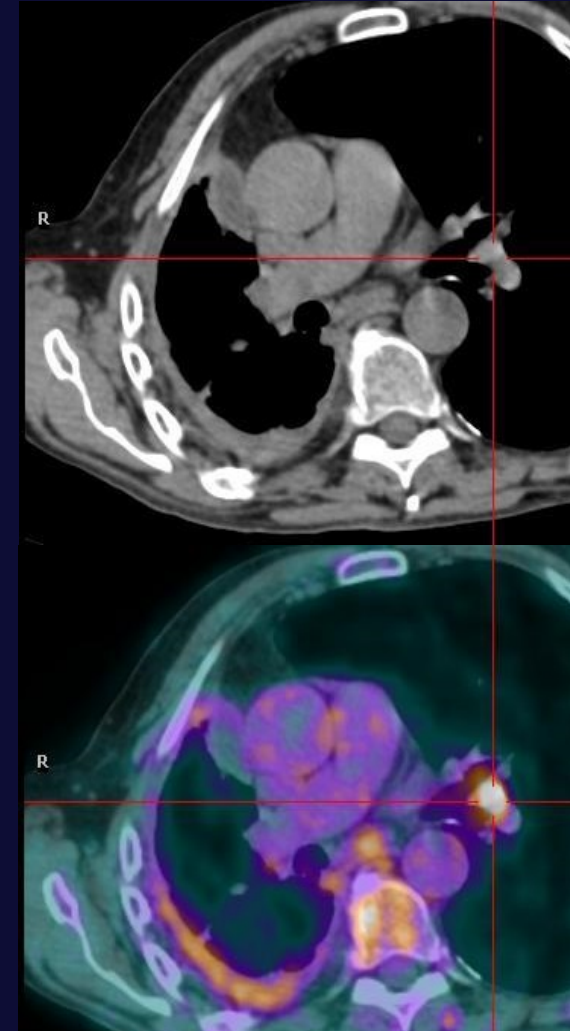


# Mesotelioma Pleurico Maligno

## *PET/CT with fluorodeoxyglucose (FDG)*

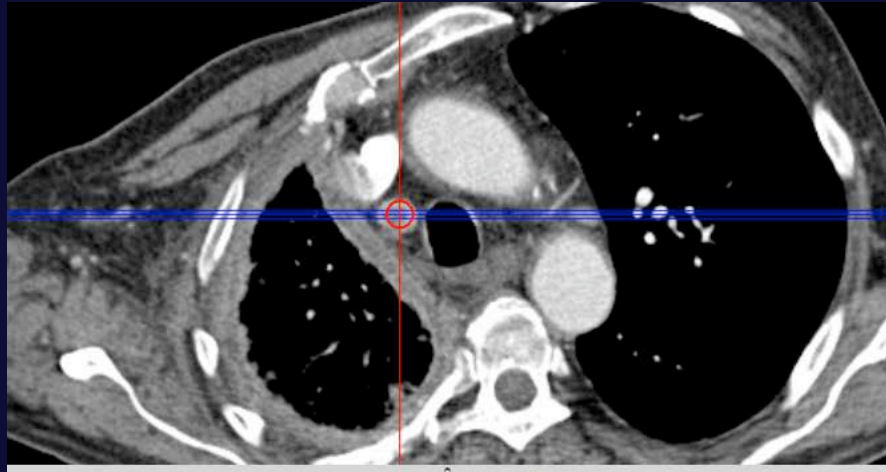
PET-CT combines the metabolic information obtained with the FDG with the anatomic detail provided by CT.

- FDG uptake (SUV) is associated with survival and prognosis ( $\uparrow\uparrow SUV_{max} \rightarrow \downarrow\downarrow survival$ )
- FP  $\rightarrow$  pleurodesis and inflammation
- Compared with CT, FDG/PET-CT better demonstrates intra and extra-thoracic lymphadenopathy and metastatic disease



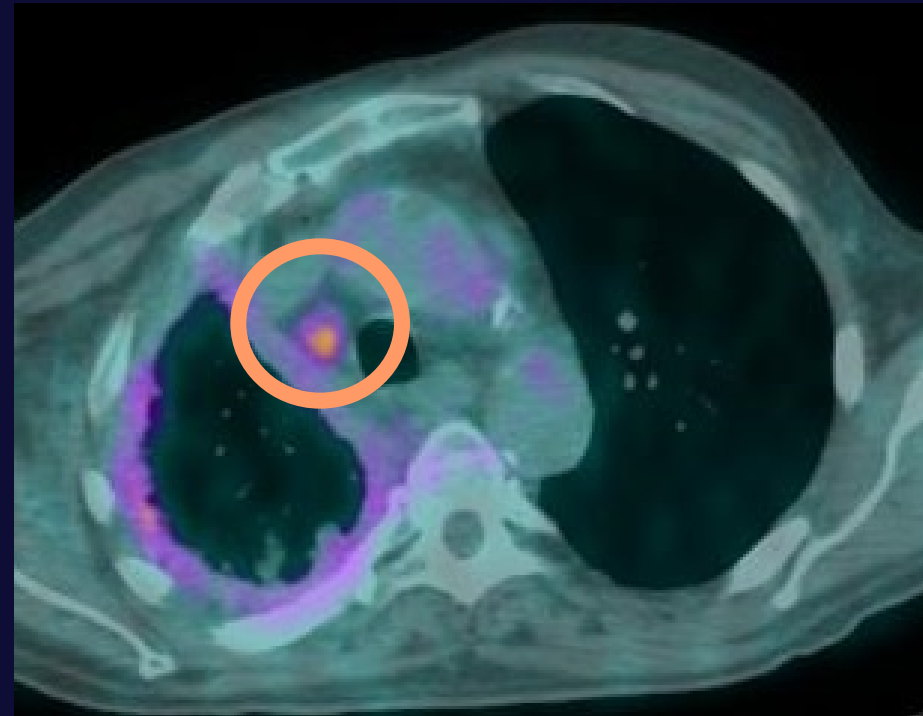
# Mesotelioma Pleurico Maligno

*lymphadenopathy → PET/CT vs CECT*



# Mesotelioma Pleurico Maligno

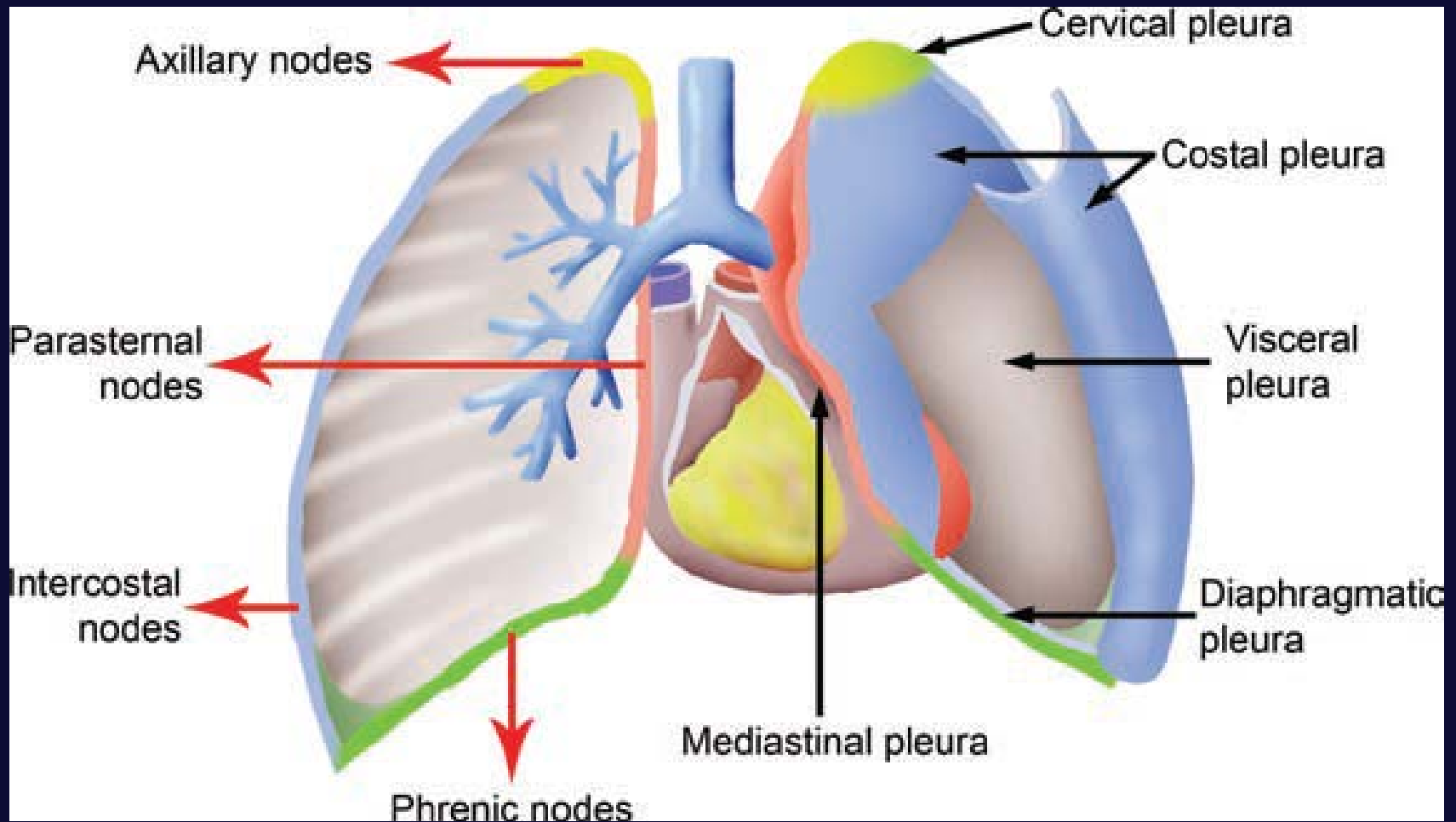
*lymphadenopathy → PET/CT vs CECT*





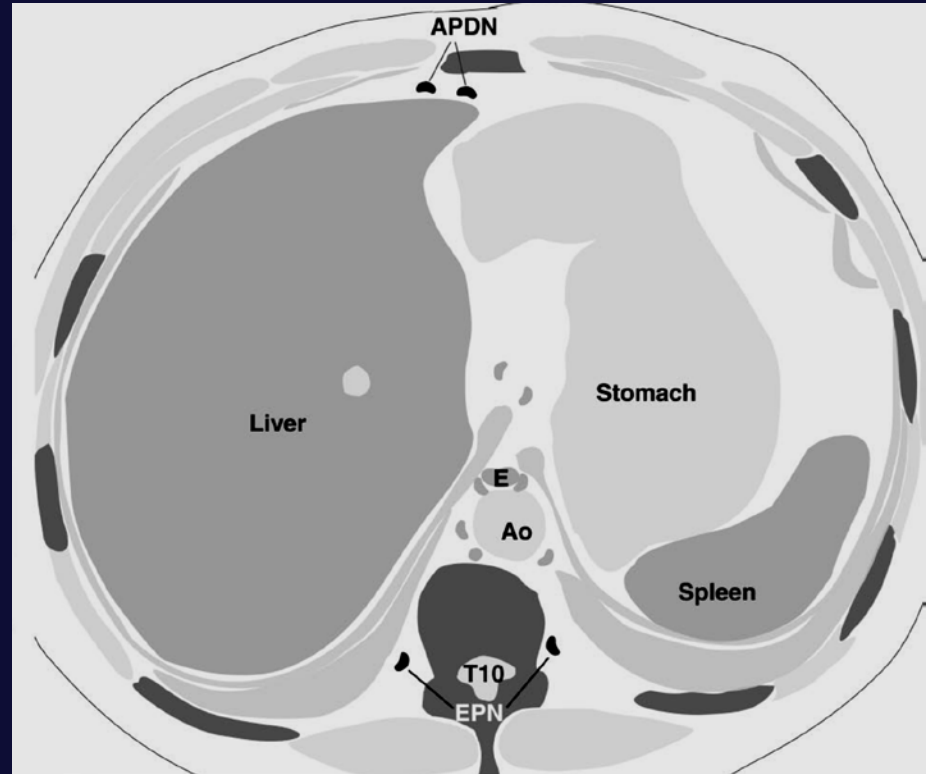
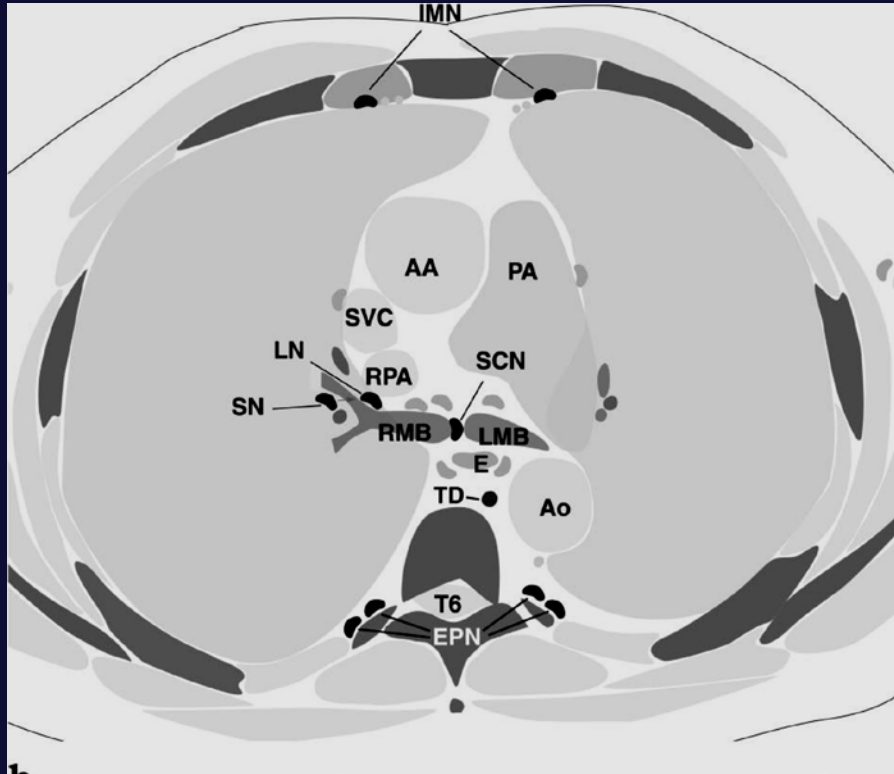
# Mesotelioma Pleurico Maligno

## *lymphadenopathy*



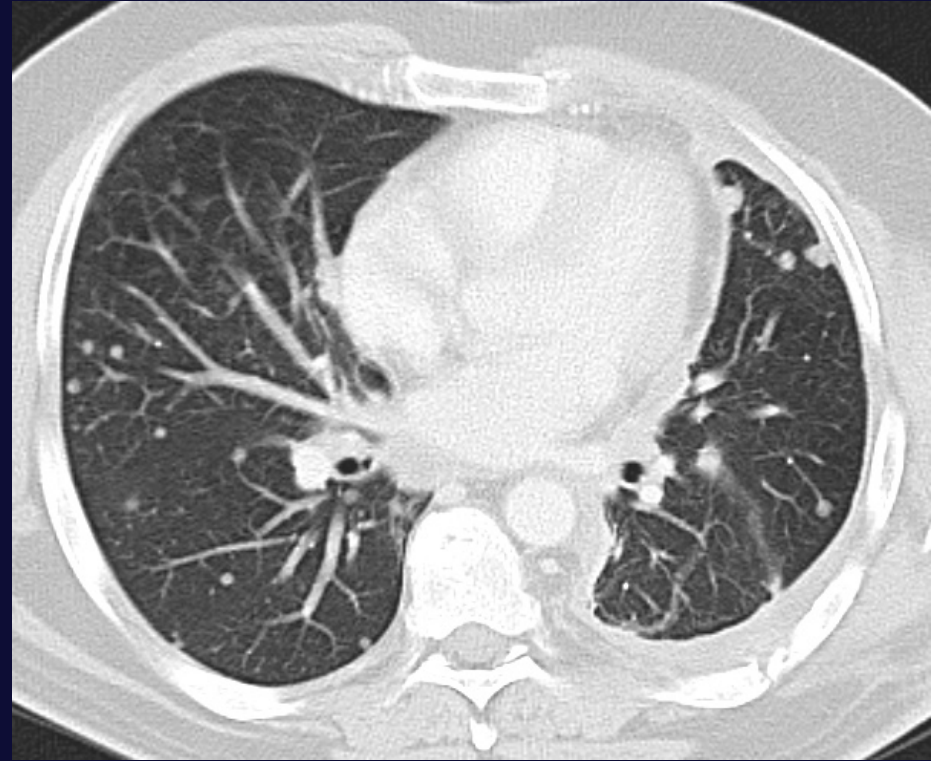
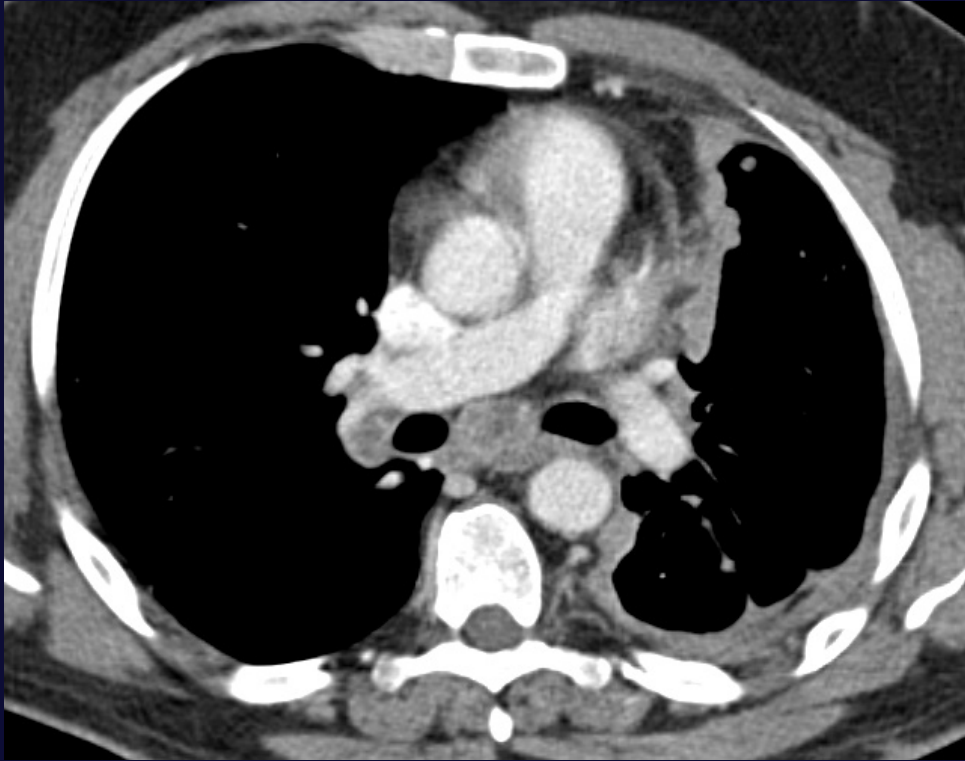
# Mesotelioma Pleurico Maligno

## *lymphadenopathy*



# Mesotelioma Pleurico Maligno

*metastatic disease*



# Mesotelioma Pleurico Maligno

## *Ruolo dell'imaging radiologico*

Elementi critici che influiscono il trattamento:

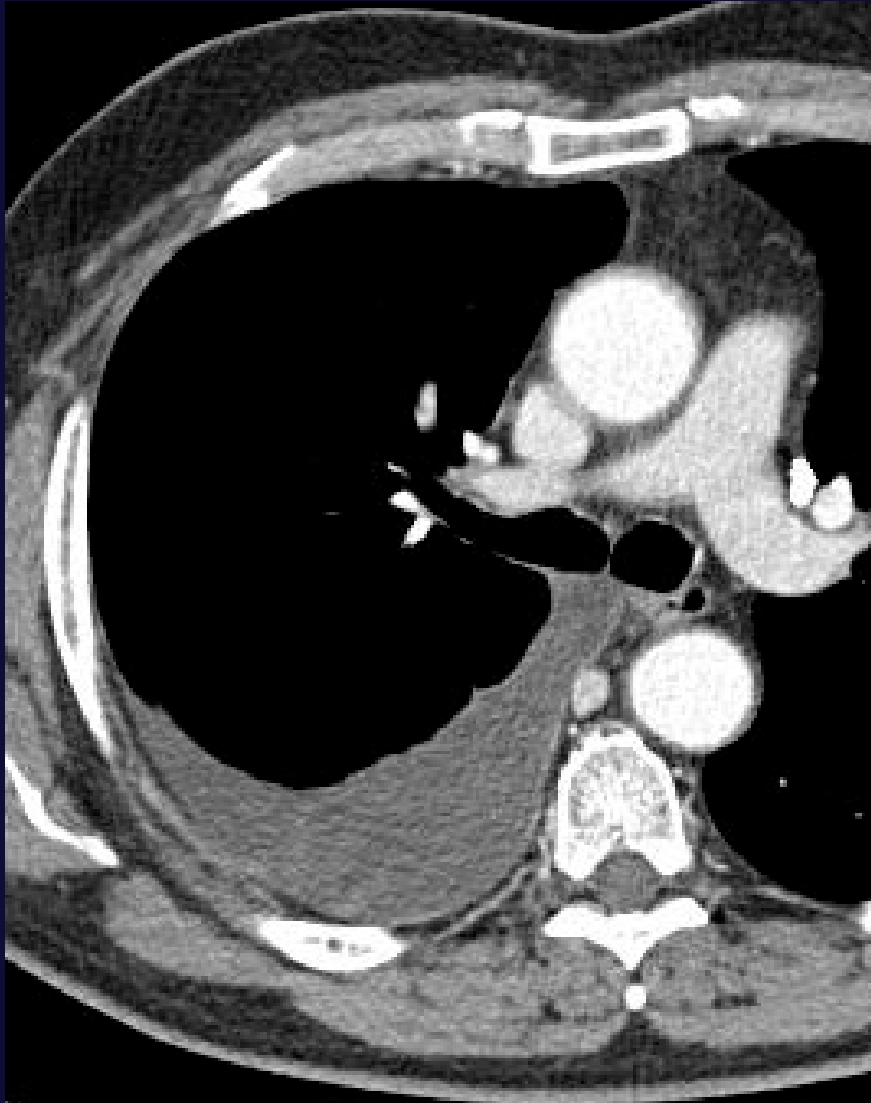
- *Infiltrazione del grasso mediastinico*
- *Infiltrazione della parete toracica*
- *Infiltrazione del diaframma*
- *Adenopatie*
- *Metastasi a distanza*

# Stadiazione - MPM

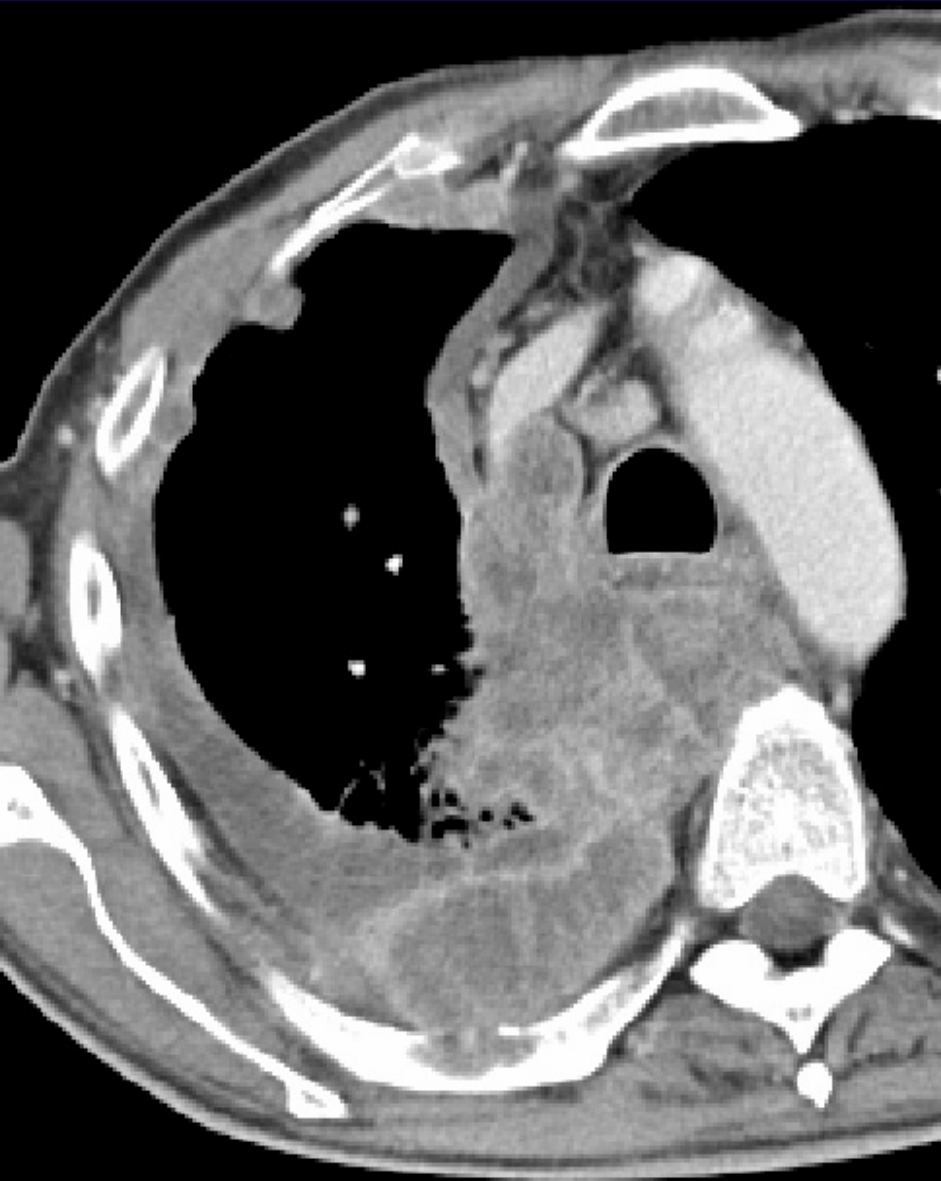
## *Ruolo dell'imaging radiologico*

- Può definire correttamente un tumore "piccolo" (potenzialmente operabile) e un tumore "grande" (sicuramente non operabile)
- Non in grado definire in maniera esaustiva i quadri intermedi
- *Imaging sottostima l'estensione della malattia → accuratezza diagnostica 80%*

MPM STADIO 1A → operabile



MPM STADIO IIIb → non operabile





# Mesotelioma Pleurico Maligno

## *Risposta al trattamento e follow-up*

Quali tecniche di imaging dovremmo utilizzare?

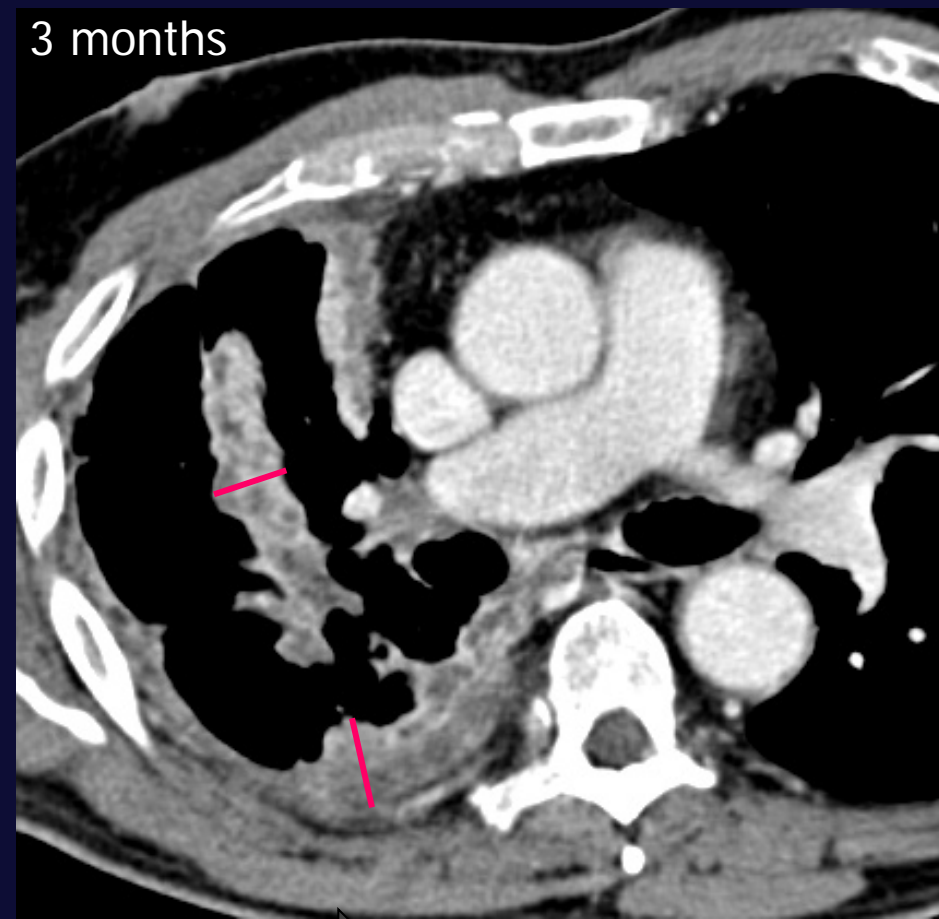
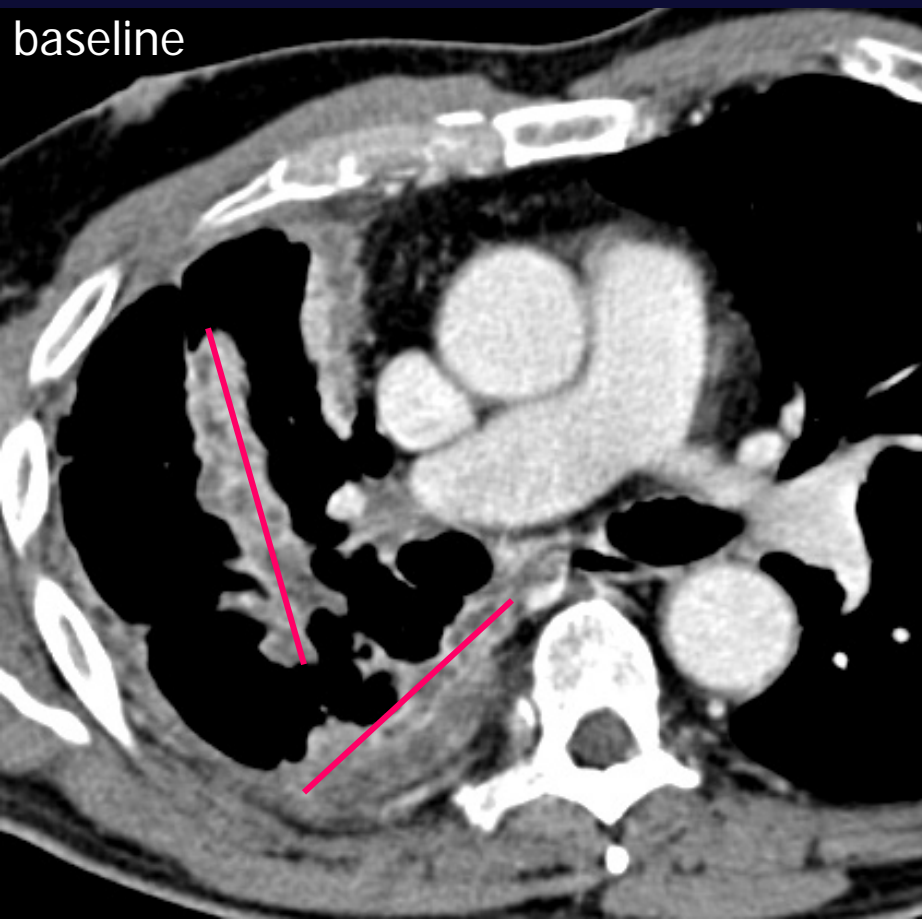
- CECT
- PET-CT
- MRI

Quali criteri di valutazione?

- modified RECIST
- Functional/metabolic criteria



# HOW TO EVALUATE TUMOR RESPONSE?



Modified RECIST criteria

# HOW TO EVALUATE TUMOR RESPONSE?

- Modified RECIST (*measurement*) criteria
  - longest perpendicular diameter to chest wall or mediastinum measured at two sites at three different levels on CT scan and at the same levels on subsequent scans
  - six measurements are summated to produce a total measurement

\*Byrne MJ, Nowak AK. Ann Oncol 2004;15:257–60.

Modified RECIST criteria for assessment of response in malignant pleural mesothelioma

Stable Disease? (SD)

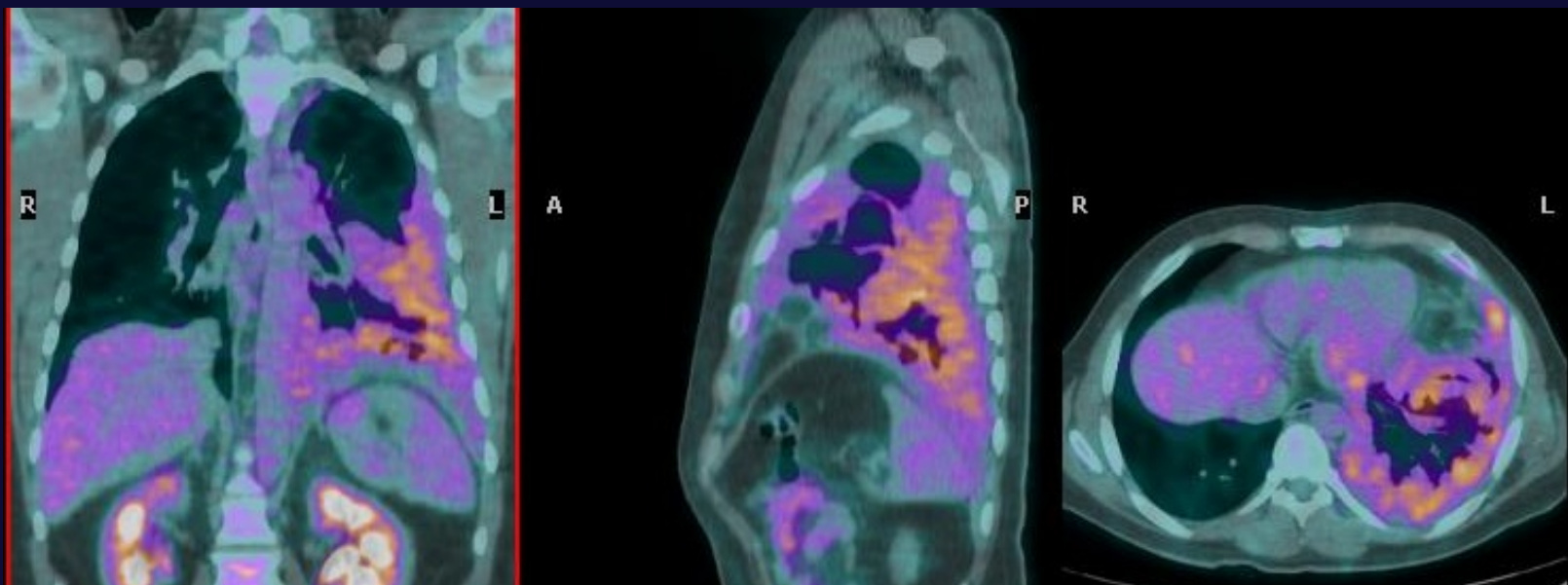
3 months



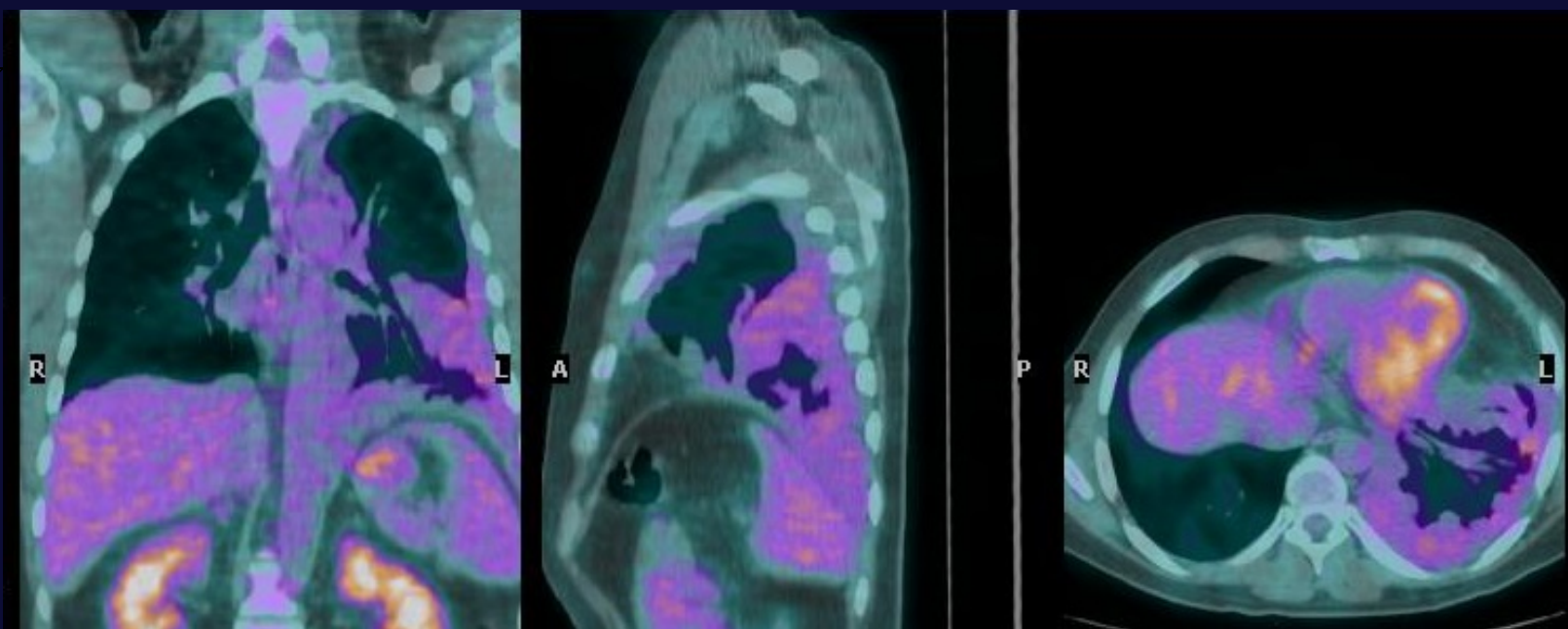
baseline



# Functional/radiometabolic criteria

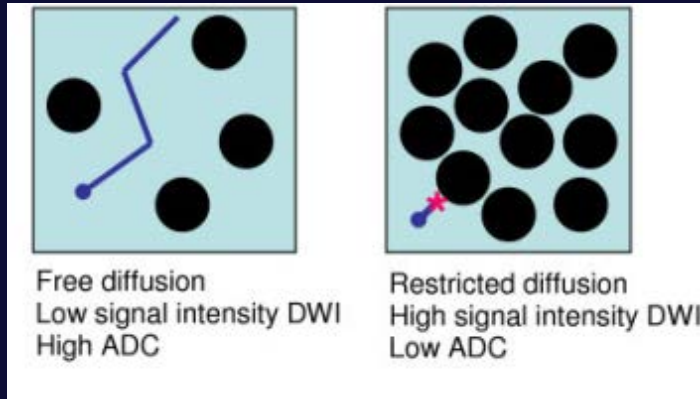


Time

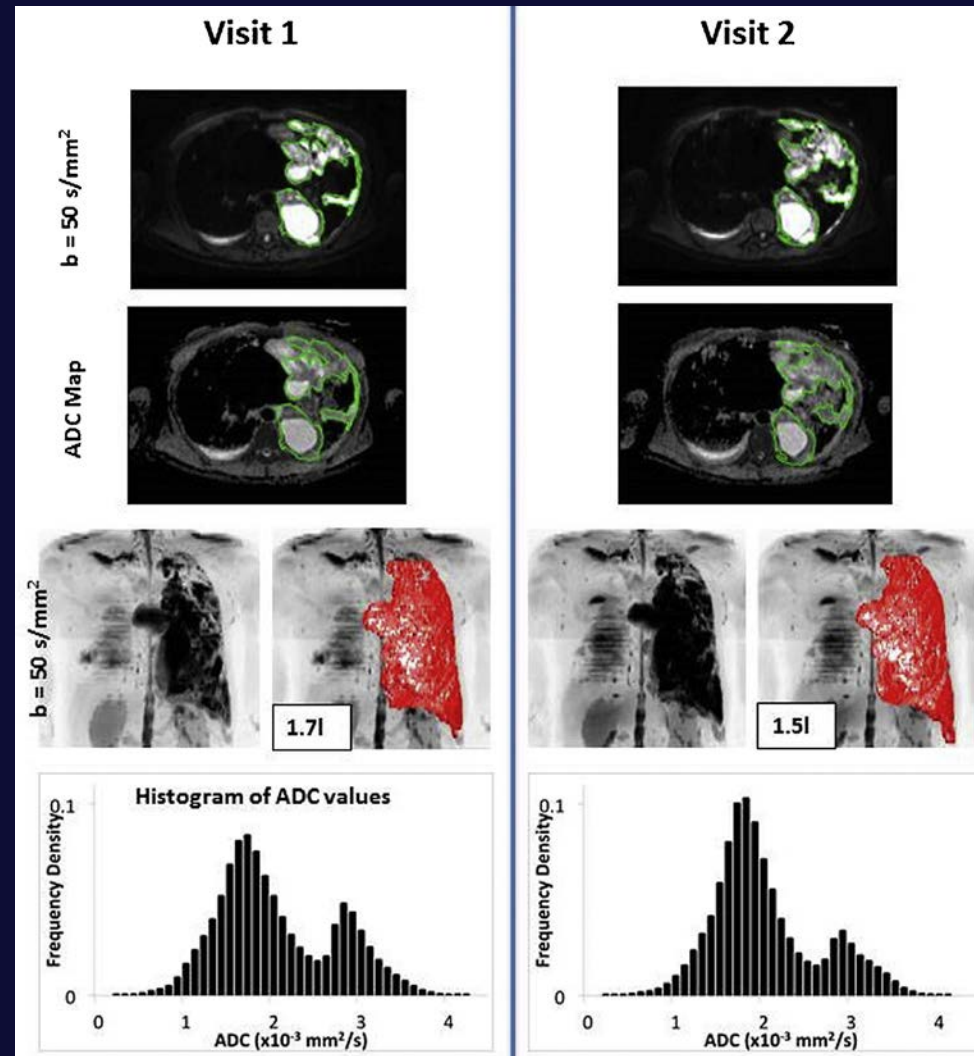


# Diffusion-weighted MRI (DWI)

Imaging "funzionale": restrizione del movimento browniano delle molecole d'acqua in tessuti caratterizzati da *elevata cellularità (tumore)*



In responders the DWI signal would decrease and the ADC value increase



# CONCLUSIONI STAGING

*identificazione della malattia e giudizio di resecabilità*

CECT

+

PET-CT



MRI

CONCLUSIONI

FOLLOW-UP

*Valutazione della risposta al trattamento*

CECT

+

PET-CT



DWI (MRI)

# Il mesotelioma

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# Grazie per l'attenzione

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