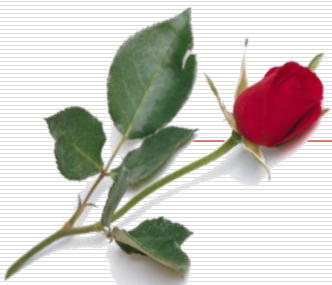




دکتر هادی اسحقی ثانی  
متخصص طب کار  
دانشیار دانشگاه علوم پزشکی هرمزگان



---

# Asbestosis

and

asbestos-related plural disease

# Asbestos

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- Hydrated silicate + magnesium
  - Fibrous structure
-

# Asbestos

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- classified Commercially
    - white asbestos (chrysotile)
    - brown asbestos (amosite)
    - blue asbestos (crocidolite)
  - 98 % chrysotile
  - All types can lead to all disorders
  - Pulmonary & non-pulmonary
  - Malignant & non-malignant
-

## آزبست در طبیعت





آزبست در دیگ بخار عایق شده

## کاربردهای آزبست

آزبست برای قرن ها استفاده می شده است اما استفاده از آن در طی و پس از جنگ جهانی دوم به شدت افزایش پیدا کرد که در عایق سازی کشتی و موارد زیر بود:

- عایق سازی لوله ها
- مواد عایق کننده سطوح
- تقویت مواد
- ضد آتش سازی
- پلاسترهای دکوری و ضد صوت
- منسوجات
- لنت و کلاج ترمز



آزبست در وسایل الکتریکی

استفاده از این ماده از اواخر دهه ۷۰ به شدت افت کرده است.

# Epidemiology

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- Mortality : 38 % lung cancer  
20 % asbestosis  
8 % mesothelioma
-

# Pathogenesis

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- Bronchioles & alveoli → interstitium  
→ macrophages → chronic  
inflammatory response → fibrosis
  - Direct cytotoxicity due to oxygen  
radicals
-



# pathology

---

- Plural plaque :
    - mid thoracic chest wall & dome of diaphragm
    - parietal pleura
    - Tend to calcify
  
  - Diffuse plural thickening :
    - Visceral pleura
-

# Exposure history

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## □ Onset & latency

- more than 20 years for fibrosis & plaque

- several years for pleural thickening

---

**Asbestos**  
 $Mg_3Si_2O_5(OH)_4$









## توفال یا تخته آزبستی



برداشتن صمغ توفال ها

## آزبست در لنت و کلاچ خودروها





# Clinical history

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Interstitial disease

- Dyspnea
  - Non-productive cough
  - Wheezing (advanced)
-

# Clinical history

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## **Pleural plaque**

- Asymptomatic
- Pleuritic or non-pleuritic chest pain

## **Diffuse pleural thickening**

- Dyspnea
  - Discomfort with full inspiration
-

# Physical exam

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- Rales : basilar , can occur in absence of graphic signs
- Cyanosis : advanced
- Clubbing : advanced

Not sensitive in early or mild disease

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# classification

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- Pleura
    - pleural thickening
    - plaque
    - diffuse pleural thickening
    - benign exudative pleuritis
    - rounded atelectasis
  - Parenchyma
    - asbestosis
-

# HRCT

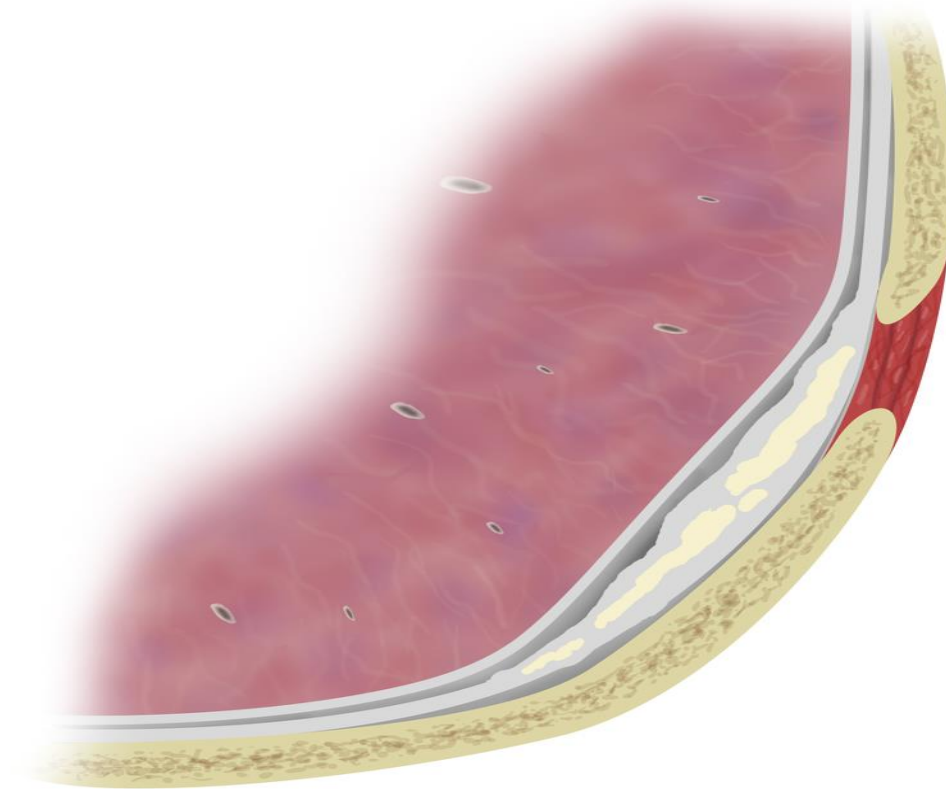
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-Prone views for assess  
basilar,posterior and subpleural  
regions

- Septal thickening
  - Parenchymal bands
  - Ground-glass opacities
  - honeycombing
-

---

## calcified pleural plaques



*M. Skalski*



# plaques

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- ❑ Most common biologic effect of asbestos exposure (82% of insulator after 40 years)
  - ❑ Parietal
  - ❑ Bilateral : pathognomonic
  - ❑ Calcified
  - ❑ Well-defined
  - ❑ Mid-thoracic or diaphragm region
-

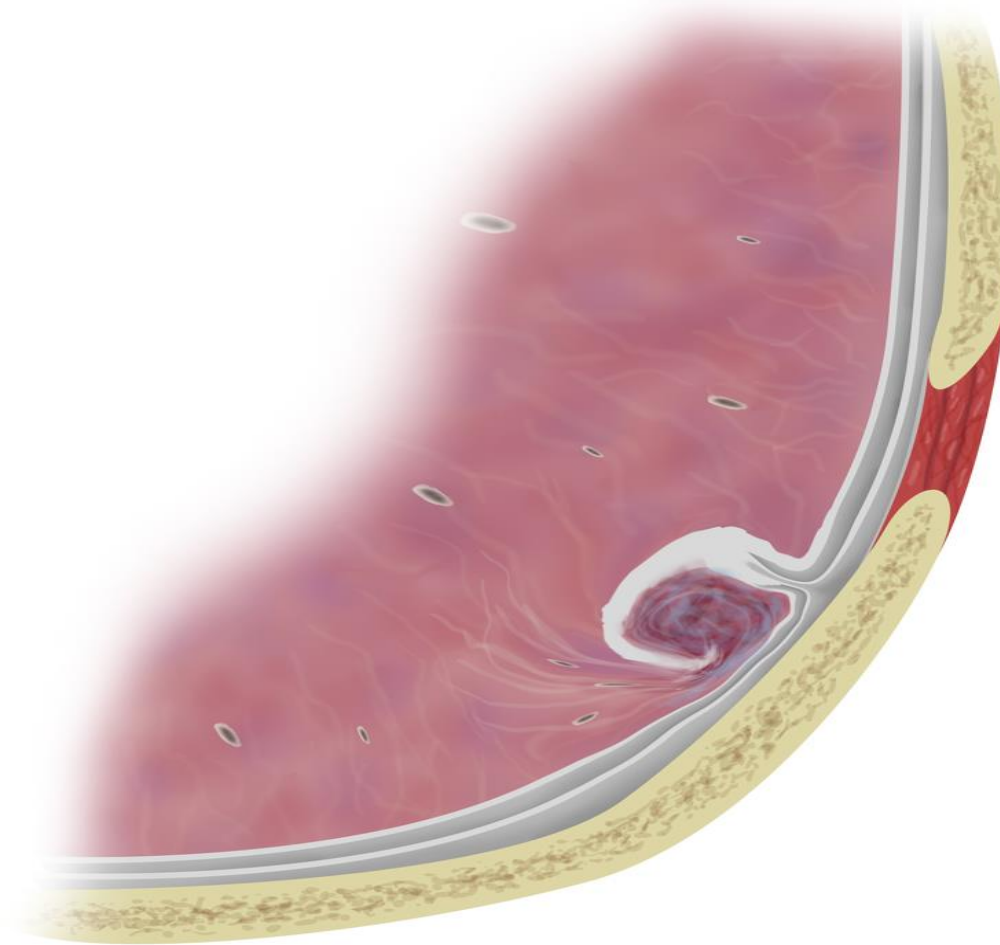
# Rounded atelectasis

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- Pressure effect of pleural thickening
  - 86% prevalence of exposure
  - Increase risk for carcinoma
-



# round atelectasis



*M. Skalski*  
CC BY NC ND

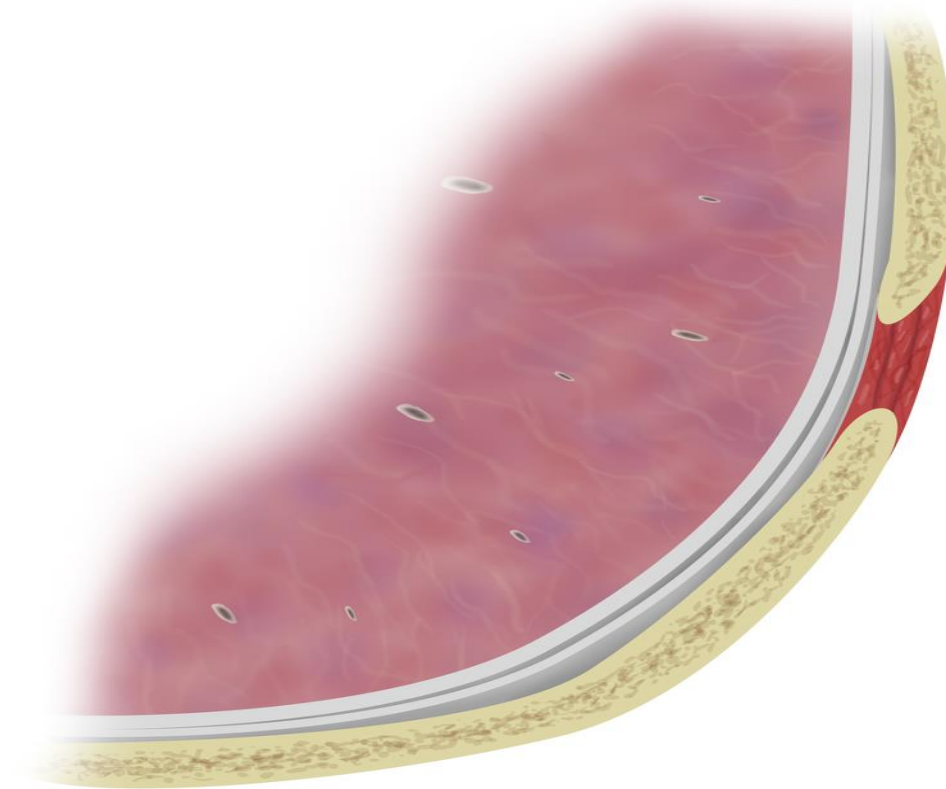
# Diffuse pleural thickening

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- Visceral
  - Blunting + more than 1mm thickness in one-third of chest wall
  - After pleuritis or not
-

---

## diffuse pleural thickening

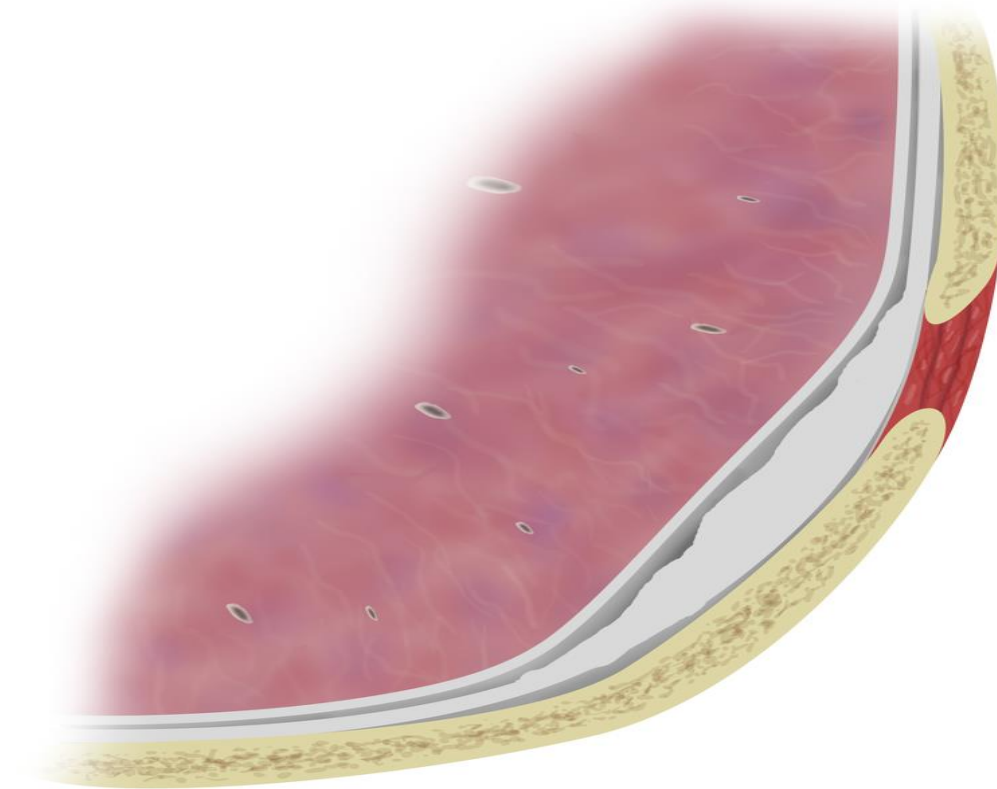


*M. Skalski*



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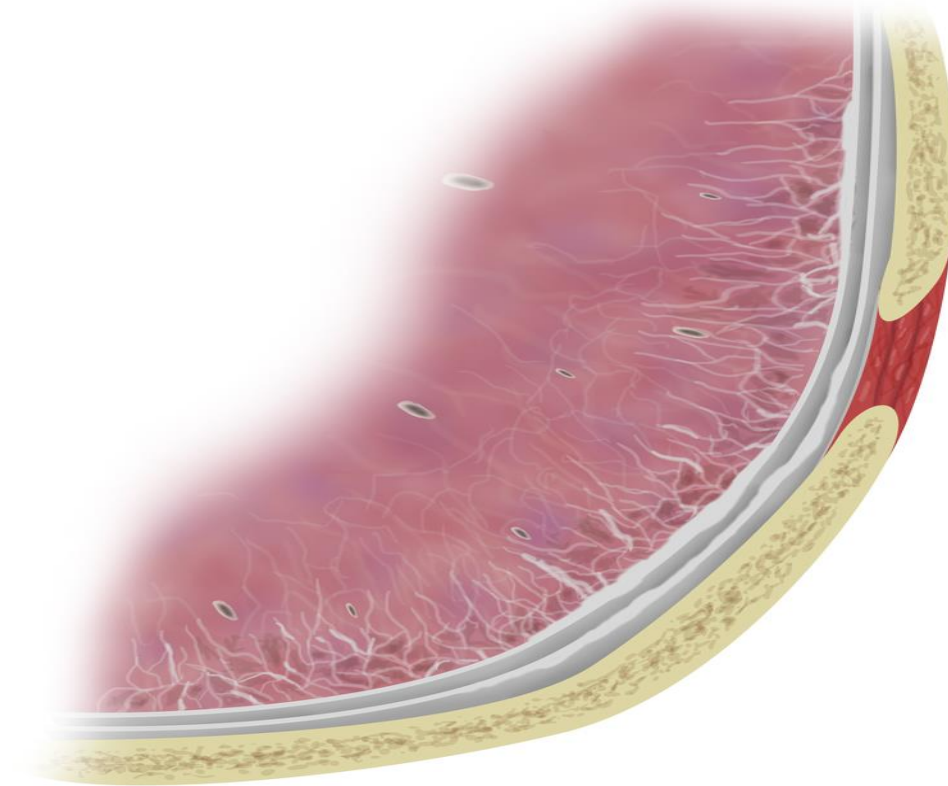
## pleural plaques



M. Skalski  


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## asbestosis related pulmonary fibrosis

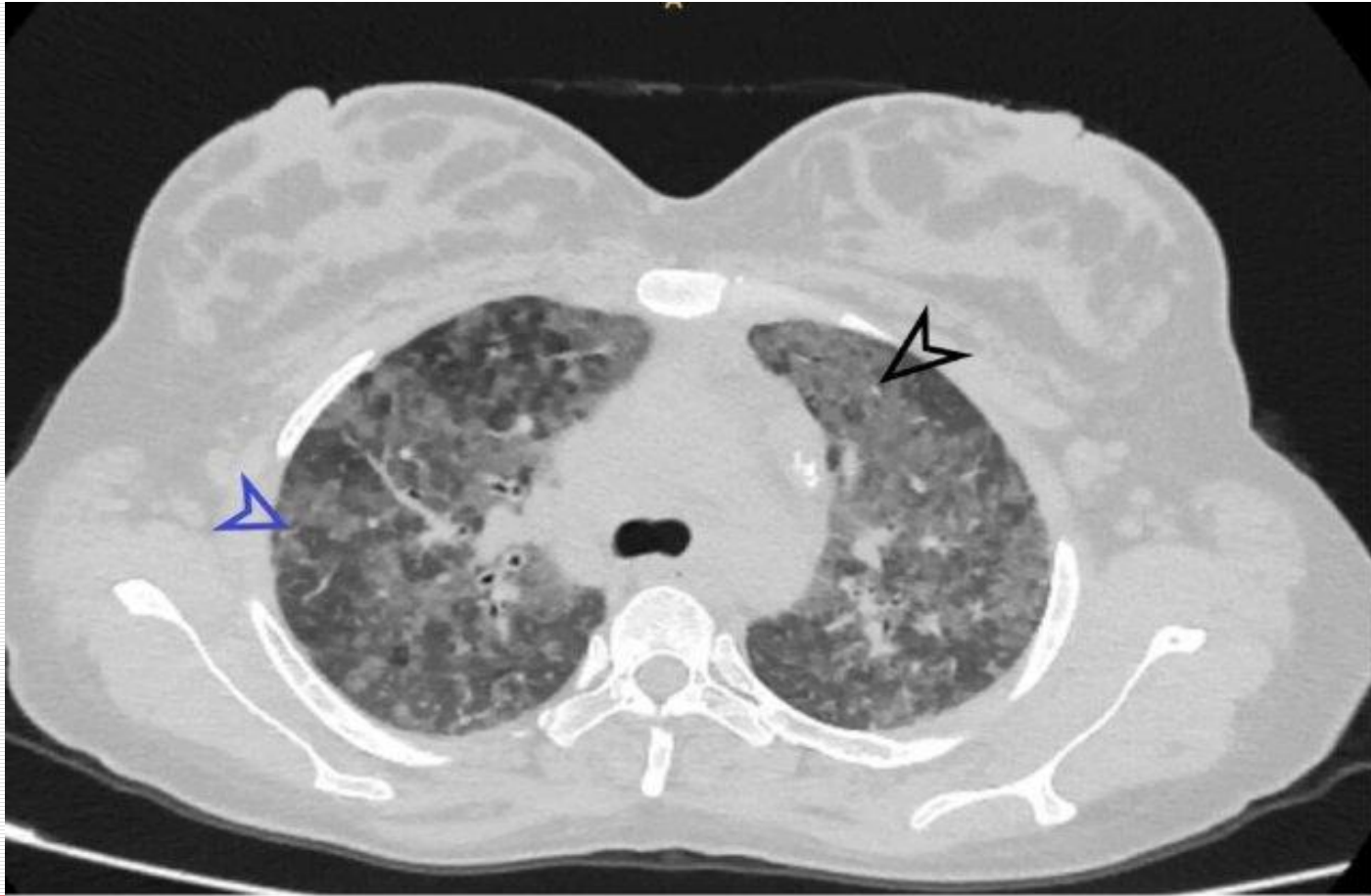


*M. Skalski*



# GGO

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# PFT

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parenchymal

- reduced DLCO : Earliest and most sensitive
  - isolated restrictive then mixed then mild isolated obstruction
-

# PFT

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Pleural disease

- Diminished VC and DLCO
-



# Other LAB tests

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- ❑ BAL(excluding other etiologies):  
ferruginous body , neutrophilia
  - ❑ SPECT ((Single-photon emission computed tomography) is a nuclear imaging technique that uses gamma rays emitted from a radioactive tracer to create 3D images of the body's organs and functions : in unilateral , progressive or asymmetric plaque for assessing of mesothelioma
  - ❑ Exercise testing : dyspnea out of proportion
-

# asbestosis

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- Increase risk for lung cancer , mesothelioma , laryngeal cancer
-

# Diagnosis

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Based on : exposure + clinic + graphy + PFT

- ❑ Exposure : sufficient intensity , 20 years latency
  - ❑ PFT : restrictive or mixed
  - ❑ HRCT : equivocal CXR , pleural obscuring abnormalities
  - ❑ Biopsy : exclusion of malignancy
-

What time is in London?

