Occupational Lung Disorders
Conditions that Should Increase Clinical Suspicion of Occupational Lung Disease

The patient raises a concern about possible exposures at work

There is a temporal relationship to clinical symptoms and work:
Symptoms worsen during or after work
Symptoms abate or improve with time off or away from the workplace

Coworkers are affected with similar symptoms

There are known respiratory hazards at work (these can be identified by Material Safety Data Sheets [MSDS] from the workplace)

Failure to respond to initial therapy or symptoms that are further exacerbated upon returning to work

Onset of a respiratory disorder without typical risk factors

Clustering of disease in one geographic area
# Elements of a Thorough Patient History for Suspected Occupational Lung Disease

**Understand the Occupation**

- What tasks do you perform at your current job?
- How long have you been working at your current job?
- What other jobs have you had in the past and for how long?

**Understand the Type and Extent of Exposure**

- Are you exposed to vapors, gases, dust, or fumes in your work?
- Do you know the amount and type of chemicals used?
- Do you have Material Safety Data Sheets (MSDS) from your workplace?
- Is your work environment well ventilated?
- Does your employer require you to wear protective equipment? Do you wear it for the full duration of your exposure?
- Is there visible dust in the air or on surrounding equipment?

**Understand the Temporal Relationship of Symptoms to the Work Environment**

- Were there any changes to your work process prior to the onset of symptoms?
- Do symptoms improve when you are away from the work environment? With vacation?

**Understand Other Relevant Exposures**

- What are your hobbies?
- Do you have pets in the home?
- What is your travel history?
A 28-year-old woman is evaluated for a 12-week history of worsening cough, shortness of breath, and low-grade fevers. She was evaluated for these symptoms 6 weeks ago and was treated with an oral fluoroquinolone antibiotic for a presumed respiratory tract infection, but her symptoms did not improve. She has not had any recent travel or animal exposures. She is employed as a sheet metal worker at an automobile manufacturing plant. Her medical history is otherwise unremarkable, she does not smoke cigarettes, and she takes no medications.

On physical examination, temperature is 37.0 °C (98.6 °F), blood pressure is 120/82 mm Hg, pulse rate is 65/min, and respiration rate is 14/min; BMI is 24. The lungs are clear to auscultation with no wheezing, and the cardiac examination is normal.

Chest radiograph shows diffuse bilateral hazy opacity without nodules, no evidence of pleural effusions, and no cardiomegaly. CT scan shows diffuse centrilobular ground-glass opacity but is otherwise normal.

Which of the following is the most appropriate next step in management?

A. Obtain detailed history of current work exposures
B. Perform allergy testing
C. Perform bronchial challenge testing
D. Repeat chest CT with intravenous contrast
Silicosis

The incidence of tuberculosis is increased in patients with silicosis, and symptoms should prompt an evaluation for possible infection.

Altered cellular immunity is associated with an increased incidence of connective tissue disease in patients with silicosis.

Silicosis is an independent risk factor for cancer.
A 70-year-old man is evaluated for a 3-month history of night sweats, weight loss, and increasing cough. He is a retired miner, and his medical history is significant for a diagnosis of pulmonary silicosis made 15 years ago based on exposure history and characteristic chest radiographic findings. He is a lifelong nonsmoker.

On physical examination, temperature is 37.9 °C (100.2 °F), blood pressure is 120/65 mm Hg, pulse rate is 84/min, and respiration rate is 22/min. Pulmonary examination reveals diffuse inspiratory crackles throughout all lung zones, unchanged from previous examinations.

Pulmonary function tests demonstrate mild obstruction with no change from 1 year ago. Chest radiograph shows multiple small nodules that appear throughout all lung zones but are upper-lobe predominant. There is no significant change in comparison with previous imaging studies.

Which of the following is the most appropriate next step in management?

A. High-resolution CT of the chest
B. Lung biopsy
C. Prednisone
D. Tuberculosis testing
A 74-year-old man is evaluated in follow-up for a diagnosis of silicosis related to his former occupation as a mine worker. Over the past 4 months he has noted a 4.5-kg (10.0-lb) weight loss. He has not had fever, chills, sweats, or change in his baseline cough or dyspnea with exertion. His medical history is otherwise unremarkable. He has a 15-pack-year smoking history but quit 30 years ago. He takes no medications.

On physical examination, temperature and blood pressure are normal, pulse rate is 85/min, and respiration rate is 18/min. Oxygen saturation breathing ambient air is 97%. No jugular venous distention is noted. Pulmonary examination reveals decreased breath sounds but no wheezes. Cardiac examination is normal. There is no peripheral edema.

His last chest CT 1 year ago showed profuse upper lobe scarring and nodularity. A current chest radiograph is consistent with these findings and is unchanged from a study 6 months ago. His tuberculin skin testing has always been negative, with the last test performed 6 months ago.

Which of the following is the most appropriate next step in management?

A. Chest MRI
B. Isoniazid, rifampin, pyrazinamide, and ethambutol
C. Prednisone
D. Repeat chest CT
A 73-year-old man is evaluated for a 14-month history of cough and increasing dyspnea on exertion. Although he is able to perform most daily activities, he becomes breathless with moderate exertion, and this has become gradually more apparent over the past several years. He reports no chest pain or other symptoms. His medical history is unremarkable and he takes no medications. He has been retired for 15 years after working as a ship builder in the Navy for 20 years. He has never smoked cigarettes.

On physical examination, temperature and blood pressure are normal, pulse rate is 95/min, and respiration rate is 22/min. Oxygen saturation is 93% breathing ambient air. There is no jugular venous distention. Pulmonary examination reveals mild inspiratory crackles at the bases. Cardiac examination is normal, and there is no peripheral edema.

A plain radiograph of the chest shows increased interstitial markings primarily at the bases, with thickened pleura and calcified pleural plaques.

Which of the following is the most likely cause of this patient's symptoms?

A. Asbestosis
B. Heart failure
C. Hypersensitivity pneumonitis
D. Idiopathic pulmonary fibrosis
A 72-year-old man is evaluated for a 2-year history of cough and a 1-year history of increasing dyspnea. He describes the cough as nonproductive, and his shortness of breath is worse with exertion. He does not have chest pain, orthopnea, paroxysmal nocturnal dyspnea, or any other symptoms. Medical history is otherwise unremarkable. He has a 15-pack-year smoking history but quit 40 years ago. He worked as a construction worker for 40 years. He takes no medications. On physical examination, temperature, blood pressure, and pulse rate are normal; respiration rate is 18/min. Oxygen saturation breathing ambient air is 96%. BMI is 24. Pulmonary examination reveals inspiratory crackles at the bases bilaterally. Cardiac examination is normal. The remainder of the physical examination is unremarkable. Chest radiograph shows increased interstitial markings at the bases; calcified parietal pleural plaques are noted bilaterally. High-resolution CT shows bilateral peripheral- and basal-predominant septal line thickening with evidence of honeycomb change at the bases. Pulmonary function tests reveal an FEV₁ of 70% of predicted, an FVC of 75% of predicted, an FEV₁/FVC ratio of 85%, and a DLCO of 65% of predicted.

Which of the following is the most likely diagnosis?

A. Asbestosis
B. COPD
C. Hypersensitivity pneumonitis
D. Idiopathic pulmonary fibrosis
Asbestosis

- Asbestos exposures are most commonly associated with construction, automotive servicing, shipbuilding, and mining industries.
- Asbestos exposure is associated with multiple forms of pleural disease, including pleural plaques, pleural fibrosis, benign asbestos pleural effusion, and mesothelioma.
- Asbestos exposure significantly increases the risk of lung cancer and lung cancer mortality, particularly when combined with smoking.
Berylliosis

• Exposure to . . .

aerospace manufacturing
microwave semiconductor electronics
beryllium mining
manufacturing of fluorescent light bulbs
A 45-year-old man is evaluated for a 6-month history of increasing daily cough, sputum production, and dyspnea on exertion. He has been employed as a coal miner for 10 years. He has never smoked and does not have a history of diabetes mellitus, hypertension, or hyperlipidemia. His family history is negative for cardiopulmonary disease.

On physical examination, vital signs are normal. Pulmonary examination reveals mildly decreased breath sounds bilaterally with no wheezes, crackles, or rhonchi. Cardiac examination is normal.

A chest radiograph is normal.

Which of the following is the most appropriate next step in management?

A. Annual chest radiography

B. High-resolution CT of the chest

C. PET chest imaging

D. Pulmonary function studies
Coal-workers’ Pneumoconiosis

Starts as anthracosis which is simple deposition of carbonaceous dust in lungs without inflammation
   This usually has obstructive physiology

This can eventually lead to fibrosis and the development of pneumoconiosis.
   This is when restrictive physiology occurs.
A 27-year-old man is evaluated for the acute onset of fever, chills, body aches, and dry cough that began last evening after returning home from trimming timber at a saw mill. He has similar symptoms that have been occurring two to three times a month for the past 3 months. These episodes always occur at home and not at the saw mill but never occur on the weekends or when he is away from home on an extended vacation. Two other colleagues who trim timber at work have also reported similar symptoms over the same time period. His medical history is otherwise unremarkable. He takes no medications.

On physical examination, the patient is currently afebrile, blood pressure is normal, pulse rate is 103/min, and respiration rate is 26/min. Pulmonary examination reveals diffuse crackles throughout all lung zones. Cardiac examination is normal except for tachycardia.

Chest radiograph shows ill-defined haziness in the upper lung zones, but no clear infiltrates. CT of the chest shows mid-lobe–predominant changes; representative findings are shown.

Which of the following is the most likely diagnosis?

A. Acute hypersensitivity pneumonitis
B. Acute interstitial pneumonia
C. Idiopathic pulmonary fibrosis
D. Nonspecific interstitial pneumonia
<table>
<thead>
<tr>
<th>Antigen Source</th>
<th>Associated Disease</th>
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<tbody>
<tr>
<td><strong>Organic Antigens: Bacteria, Fungi, Mycobacteria</strong></td>
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<tr>
<td>Moldy hay, silage, or grain</td>
<td>Farmer’s lung</td>
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<td>Potatoes packed in moldy hay</td>
<td>Potato worker’s lung</td>
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<td>Moldy typesetting water</td>
<td>Bible printer’s lung</td>
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<td>Moldy cheese</td>
<td>Cheese washer’s lung</td>
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<td>Aerosolized hot tub water</td>
<td>Hot tub lung</td>
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<td>Stagnant humidifier water</td>
<td>Humidifier lung</td>
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<tr>
<td>Moldy cork</td>
<td>Suberosis</td>
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<tr>
<td>Moldy wood dust</td>
<td>Wood dust or wood trimmer’s lung</td>
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<thead>
<tr>
<th>Antigen Source</th>
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<td>Bird feathers and droppings</td>
<td>Bird fancier’s lung</td>
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<td>Processed turkey or chicken serum</td>
<td>Turkey or chicken handler’s lung</td>
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<td>Animal pelts</td>
<td>Furrier’s lung</td>
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<tr>
<td>Laboratory animal dander, serum, excrement</td>
<td>Laboratory worker’s lung</td>
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<tr>
<td>Diisocyanate(s)</td>
<td>Chemical lung</td>
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<td>Aerosolized machine lubricants</td>
<td>Machine operator’s lung</td>
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<tr>
<td>Pyrethrum</td>
<td>Pesticide lung</td>
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