

silicosis, the presence of these nodules (*simple CWP*) usually is not associated with pulmonary impairment. In addition to CWP, coal dust can cause chronic bronchitis and COPD ([Chap. 292](#)). The effects of coal dust are additive to those of cigarette smoking.

Complicated CWP is manifested by the appearance on the chest radiograph of nodules ≥ 1 cm in diameter generally confined to the upper half of the lungs. As in silicosis, this condition can progress to PMF that is accompanied by severe lung function deficits and associated with premature mortality. Despite improvements in technology to protect coal miners, cases of PMF still occur in the United States at a disturbing rate.

Caplan syndrome ([Chap. 358](#)), first described in coal miners but subsequently in patients with silicosis, is the combination of pneumoconiotic nodules and seropositive rheumatoid arthritis. Silica is often present in anthracitic coal dust, and its presence may contribute to risk of PMF.

■ CHRONIC BERYLLIUM DISEASE

Beryllium is a lightweight metal with tensile strength, good electrical conductivity, and value in the control of nuclear reactions through its ability to quench neutrons. Although beryllium may produce an acute pneumonitis, it is far more commonly associated with a chronic granulomatous inflammatory disease that is similar to sarcoidosis ([Chap. 367](#)). Unless one inquires specifically about occupational exposures to beryllium in the manufacture of alloys, ceramics, or high-technology electronics in a patient with sarcoidosis, one may miss entirely the etiologic relationship to the occupational exposure. What distinguishes CBD from sarcoidosis is evidence of a specific cell-mediated immune response (i.e., delayed hypersensitivity) to beryllium.

The test that usually provides this evidence is the beryllium lymphocyte proliferation test (BeLPT). The BeLPT compares the *in vitro* proliferation of lymphocytes from blood or bronchoalveolar lavage in the presence of beryllium salts with that of unstimulated cells. Proliferation is usually measured by lymphocyte uptake of radiolabeled thymidine.