visible on chest X-rays. Most commonly this appears as a bilateral symmetric hilar and mediastinal lymph node enlargement. However, despite having large thoracic lymph nodes and parenchymal lung disease, the patient may be asymptomatic.

"The patient may feel completely fine – with no cough and no shortness of breath," says Kenneth Knox, MD, assistant professor of medicine and co-director of the IU Center for Sarcoidosis and Immunologic Lung Disease. "But many times, even if the lungs are minimally involved, we will do a bronchoscopy so we can look into the airways and perform washings and small biopsies through the scope. Bronchoscopy with transbronchial biopsies is the preferred method of diagnosis with a high sensitivity."

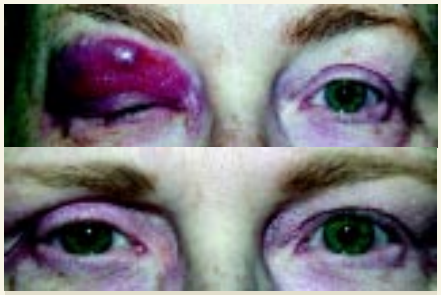
Dermatologic findings. Approximately 25 percent of patients, especially those with chronic sarcoidosis, have skin lesions. These include papules, plaques or subcutaneous nodules. Other rarer forms include scar sarcoid, erythroderma, ulcerations; verrucous or ichthyosifiorm papules; hypomelanotic, psoriasiform plaques and alopecia (hair loss).

"Most patients exhibit multiple firm annular papules or plaques," says Ginat W. Mirowski, DMD, MD, associate professor of oral medicine and dermatology. "The face, eyelids, neck and shoulders are commonly affected. In suspected cases, lesions may appear red, purple-brown or yellow. When lesions are biopsied, typical granulomas are found in the skin. Scar sarcoid occurs when sarcoidal lesions appear within areas of surgical scars or within resolved inflammatory dermatoses."

Several reactive conditions are noted in patients with sarcoidosis. Erythema nodosum first appears as tender red nodules on the shins of young women. Laboratory findings are nonspecific but an elevated erythrocyte sedimentation rate (ESR) is common. Tuberculous skin testing can be falsely nonreactive in these patients.

Hepatic granulomas. Seventy percent of patients, even if patients are asymptomatic with normal liver function tests, have hepatic granulomas. "One of our hepatologists has me follow up with a patient any time he diagnoses granulomatous hepatitis," says David Wilkes, MD, associate professor of medicine, microbiology and immunology, and director of the IU Center for Sarcoidosis and Immunologic Lung Disease. Although this type of manifestation is often seen, it rarely becomes progressive resulting in severe hepatic dysfunction with jaundice.

Ophthalmic issues. Granulomatous uveitis is uncommon, but can be devastating. It is usually bilateral and may cause severe vision loss from secondary glaucoma if it is not treated. Symptoms include blurred vision and photophobia. "Many times we will send people to an ophthalmologist even if they don't have symptoms," says Dr. Knox. "Sometimes there are characteristic changes of the conjunctive or lacrimal glands that could be biopsied very easily and less invasively than bronchoscopy." However, the diagnostic yield is highly variable.



This patient had sudden death from myocardial sarcoid. She also had sarcoid uveitis. She was treated with multiple immunosuppressive medications and an implantable defibrillator with moderate improvement. This large, nodular sarcoidal lesion was felt to be cellulitis or an abscess. Drainage was attempted and pathology showed noncaseating granulomas. Lid reconstruction was necessary. With escalation of therapy and use of third line agents, significant control of inflammation was finally attained.

Photos: Richard Burgett, MD (top) John Murphy (bottom)

Subtle changes on a detailed ophthalmologic exam can provide supportive evidence in difficult cases of sarcoidosis.

Neurologic symptoms. A patient with central nervous system involvement may have headaches, visual disturbances, paresis of the lower extremities and cranial nerve palsies. "I would take a history, then begin by performing a neurologic exam consisting of mental status testing, cranial nerve evaluation, motor and sensory examination, cerebellar testing, and station and gait evaluation," says Holli Horak, MD, assistant professor of clinical neurology. "Subsequent testing would depend on whether the problem is central or peripheral; further, many other disease processes including infectious, demyelinating and autoimmune can mimic or overlap with sarcoid. It's important to take all that into consideration during an examination."

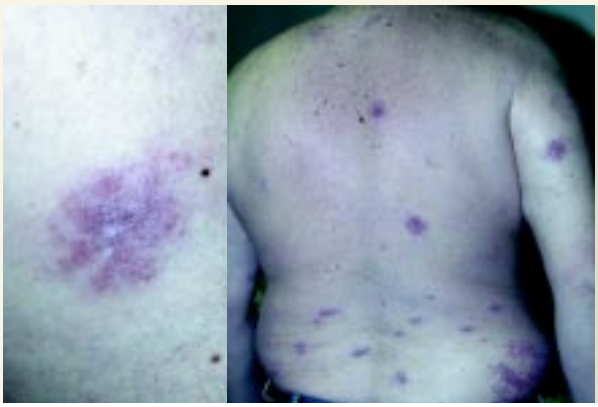
Testing alternatives. A patient suspected of having sarcoid will routinely undergo pulmonary function testing and a chest X-ray – sometimes leading to a CT scan, depending on how much the lung is involved. An ophthalmology consult is common, as well as an EKG to seek out abnormalities in the conduction system.

Other manifestations of sarcoidosis include diabetes insipidus, hypercalcemia and hypercalciuria. The latter two may result in renal calculi or nephrocalcinosis and renal failure. Sometimes the exact cause of these maladies is difficult to pinpoint. "It needs to be stressed sarcoidosis is a diagnosis of exclusion," says Dr. Wilkes.

In the proper clinical setting, a serum angiotensin coverting enzyme (ACE) level test may provide useful information. It is not specific to sarcoidosis, but if someone with a cough, shortness of breath and eye soreness also has an elevated ACE level, it could indicate the presence of sarcoidosis.

Other blood work might include a white cell count, since patients with sarcoidosis have low white cells and sometimes low red cell counts as well.

Often these tests are taken routinely for baseline studies. "Sarcoidosis can get better in the eye, then manifest in the lung," says Dr. Knox. "Sometimes it can be a lifelong disease, sometimes it improves on its own, and sometimes it degenerates and stays exactly the same. We have to tailor our treatment plans according to how the patients are doing."



Lupus pernio is a disease-specific cutaneous manifestation of sarcoidosis which is shown here on the trunk but typically found on the face. Biopsies of this lesion will yield noncaseating granulomas, supporting the diagnosis of sarcoidosis.

Photos: John Murphy