



Mayo Clinic Rochester

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Mayo Clinic Study Implicates Fungus as Cause of Chronic Sinusitis

ROCHESTER, MINN. -- Mayo Clinic researchers say they have found the cause of most chronic sinus infections -- an immune system response to fungus. They say this discovery opens the door to the first effective treatment for this problem, the most common chronic disease in the United States. (See [graph](#).)

An estimated 37 million people in the United States suffer from chronic sinusitis, an inflammation of the membranes of the nose and sinus cavity. Its incidence has been increasing steadily over the last decade. Common symptoms are runny nose, nasal congestion, loss of smell and headaches. Frequently the chronic inflammation leads to polyps, small growths in the nasal passages which hinder breathing.

"Up to now, the cause of chronic sinusitis has not been known," say the Mayo researchers: Drs. David Sherris, Eugene Kern and Jens Ponikau, Mayo Clinic ear, nose and throat specialists. Their report appears in the [September issue](#) of the journal Mayo Clinic Proceedings.

"Fungus allergy was thought to be involved in less than ten percent of cases," says Dr. Sherris. "Our studies indicate that, in fact, fungus is likely the cause of nearly all of these problems. And it is not an allergic reaction, but an immune reaction."

The researchers studied 210 patients with chronic sinusitis. Using new methods of collecting and testing mucus from the nose, they discovered fungus in 96 percent of the patients' mucus. They identified a total of 40 different kinds of fungi in these patients, with an average of 2.7 kinds per patient.

In a subset of 101 patients who had surgery to remove nasal polyps, the researchers found eosinophils (a type of white blood cell activated by the body's immune system) in the nasal tissue and mucus of 96 percent of the patients.

The results, the researchers say, clearly portray a disease process in which, in sensitive individuals, the body's immune system sends eosinophils to attack fungi and the eosinophils irritate the membranes in

the nose. As long as fungi remain, so will the irritation.

"This a potential breakthrough that offers great hope for the millions of people who suffer from this problem," says Dr. Kern. "We can now begin to treat the cause of the problem instead of the symptoms."

More research is underway at Mayo Clinic to confirm that the immune response to the fungus is the cause of the sinus inflammation. The researchers are also working with pharmaceutical companies to set up trials to test medications to control the fungus. They estimate that it will be at least two years before a treatment will be widely available.

The researchers distinguish chronic sinusitis -- sinusitis that lasts three months or longer -- from acute sinusitis, which lasts a month or less. They say that the cause of the acute condition is usually a bacterial infection.

Antibiotics and over-the-counter decongestants are widely used to treat chronic sinusitis. In most cases, antibiotics are not effective for chronic sinusitis because they target bacteria, not fungi. The over-the-counter drugs may offer some relief of symptoms, but they have no effect on the inflammation.

"Medications haven't worked for chronic sinusitis because we didn't know what the cause of the problem was," says Dr. Ponikau. "Finally we are on the trail of a treatment that may actually work."

Thousands of kinds of single-cell fungi (molds and yeasts) are found everywhere in the world. Fungal spores (the reproductive part of the organism) become airborne like pollen. Some people develop allergies to fungi. The new evidence from the Mayo study suggests that many people also develop a different kind of immune system response.

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- [Full-text report](#) from Mayo Clinic Proceedings



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