

2001: Rapid test to diagnose anthrax poisoning

Shortly after the September 11, 2001, terrorist attacks, another crisis developed as letters containing anthrax appeared in the U.S. mail. From accidental exposure to these letters, five Americans died and 22 became ill in the worst biological attack in U.S. history.

Amid heightened anxiety and security throughout the country, Mayo Clinic made a major advance in protecting public health. Working with Roche Diagnostics, Mayo scientists developed a DNA test that can rapidly diagnose exposure to anthrax in less than one hour.

The new test was a boon for public health and safety. It replaced previous tests that took one to three days to yield results and required the extra effort of sending samples to sophisticated laboratories.

History of a fatal infection

Anthrax is a serious infectious disease caused by bacteria known as *Bacillus anthracis*. Anthrax can occur in soil; it commonly affects domestic and wild animals around the world. While rare in the United States, people can become ill from anthrax after exposure to contaminated animals and animal products. The disease is not contagious and does not pass from one person to another like the flu or a cold.

Anthrax is well described in ancient texts, and it has been suggested that the famous Plague of Athens (430–427 BC) was an epidemic of anthrax. The name is derived from the Greek word “anthracites,” which means “coal-like,” referring to the typical raised, shiny black lesions on the skin called black eschar. In the 19th century, French scientist Louis Pasteur conducted pioneering work on a vaccine for anthrax to protect animal populations. Today, the greatest risk of anthrax occurs as a biological weapon. Nearly 20 nations are believed to have offensive biological weapons programs that include anthrax.

According to the Centers for Disease Control and Prevention (CDC), “If a bioterrorist attack were to happen, *Bacillus anthracis* ... would be one of the biological agents most likely to be used.” The bacteria associated with anthrax is rated Tier One as “presenting the greatest risk of deliberate misuse with significant potential for mass casualties or devastating effect to the economy, critical infrastructure or public confidence, and pose a severe threat to public health and safety.”

Because early detection and treatment are vital, Mayo’s test opened a new era in addressing potentially devastating effects of widespread anthrax infection. It made anthrax testing available at the local level, rather than requiring sophisticated reference laboratory resources. This allows community-based physicians to begin treating patients who are exposed to anthrax in a more timely fashion.

Now, for the first time in history, with the availability of the Mayo Clinic rapid DNA anthrax test, victims exposed to anthrax have a therapeutic ally that significantly blunts the

infectious impact of anthrax to combat bioterrorism.

At the height of public concern about anthrax, Mayo and Roche gave test kits free of charge to laboratories and medical centers throughout the country.

SOURCES

1. Centers for Disease Control, 2016. "A History of Anthrax."
2. Science Daily Online, 2001. "Mayo Clinic Develops New Rapid Anthrax Test; Roche Diagnostics to Make One-Hour Test Widely Available."
3. The Wall Street Journal, Nov. 6, 2001. "Mayo Clinic, Unit of Roche develop rapid anthrax test."