

## Treatment Outcomes Highlight Dangers of Extensively Drug-Resistant Tuberculosis

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DENVER — In a retrospective study of 174 tuberculosis patients treated at National Jewish Health, patients with extensively-drug-resistant tuberculosis (XDR-TB) were almost eight times as likely to die as patients with multi-drug resistant tuberculosis (MDR-TB). National Jewish Health is a national referral center for the treatment of drug-resistant tuberculosis, and its physicians are recognized worldwide for their expertise in the treatment of drug-resistant tuberculosis.

The study, published in the August 7, 2008, issue of *The New England Journal of Medicine*, highlights the need for optimal management of multi-drug resistant cases to prevent the progression to XDR-TB, associated with poorer outcomes, including greater risk of death from tuberculosis.

“Over the years, we have become quite proficient at treating multi-drug resistant tuberculosis with initial treatment success rates greater than 90 percent in recent years,” said lead author Michael Iseman, MD, Professor of Medicine at National Jewish. “Extensively drug-resistant cases, however, are much more difficult to treat and we still lose more of these patients than we save.

Drug-resistance has become a major problem in the treatment of tuberculosis, making the most effective and best tolerated medications ineffective for millions of patients around the world. Drug resistance arises when inadequate treatment kills most, but not all, of the tuberculosis organisms in a patient; the remaining organisms have often mutated to become resistant to various medications. While multi-drug resistance has been known for many years, XDR-TB was first recognized in March 2006.

MDR-TB is now defined as resistance to at least two first-line drugs, isoniazid and rifampin. XDR-TB is resistant to rifampin, isoniazid, a fluoroquinolone and a second-line injectable drug.

National Jewish researchers previously reported an overall long-term success rate between 1984 and 1998 of 75 percent for treatment of MDR-TB. Subsequent analysis revealed initial treatment success rates of greater than 90 percent in the years 1994-1998.

The researchers decided to revisit their data after the recognition of XDR-TB. Of 174 MDR-TB patients who had undergone sufficient drug-susceptibility testing, 10 were classified as XDR-TB, and 164 as MDR-TB. Among multi-drug resistant cases, 14 died from tuberculosis or surgery to treat the disease, and 22 died from other causes. Among the 10 XDR-TB patients, five died, all of TB or surgery to treat it.

Statistical analysis showed that MDR-TB patients were 23.4 times as likely as XDR-TB patients to have initial treatment success, defined as no TB organisms cultured from repeated sputum samples over a three month period during active treatment. MDR-TB patients were 21.1 times as likely as XDR-TB patients to have long-term success: completion of therapy and no evidence of TB organisms in their sputum or lungs for the duration of follow-up, which lasted at least five years and as long as 15 years.

XDR-TB patients were 7.9 times as likely as MDR-TB patients to die from tuberculosis or surgery to treat it, and 2.5 times as likely to die from all causes during follow up.

“These data underscore the critical importance of optimal management of cases of multidrug-resistant tuberculosis, lest they develop into extensively drug-resistant tuberculosis,” wrote the authors.

**National Jewish Health** is the leading respiratory hospital in the nation. Founded 121 years ago as a nonprofit hospital,

National Jewish Health today is the only facility in the world dedicated exclusively to groundbreaking medical research and treatment of patients with respiratory, cardiac, immune and related disorders. Patients and families come to National Jewish Health from around the world to receive cutting-edge, comprehensive, coordinated care. To learn more, visit the media resources page.

## Media Contacts

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