

# EPI CONNECTIONS

June 2007

A Bimonthly Newsletter of the Communicable Disease Division

## Tuberculosis

**“Consumption”... “White Plague”... Tuberculosis.** In past times the words alone incited fear and uncertainty in patients and public alike. With the advent of effective chemotherapies in the 1940’s and ‘50’s, tuberculosis (TB) has become a preventable, treatable, and predominantly curable disease. As a result, U.S. cases of TB dropped dramatically and public awareness faded. However, each year 9 million people develop active TB and there are 2 million TB-related deaths worldwide. In recent weeks, a young Atlanta lawyer and the death of a young Nepali nursing student in Colorado Springs have once again brought TB into the spotlight.

The Atlanta lawyer’s diagnosis of extensively drug-resistant (XDR) TB is rare in the U.S. Between 1993 and 2006, 49 cases (4% of the multi-drug resistant [MDR] TB cases diagnosed in the U.S.) met the case definition for XDR-TB. Internationally, the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC) analyzed TB data from 2000-2004 and found that XDR-TB has been identified in all regions of the world, and it was most frequently reported in Asia and countries of the former Soviet Union. In Latvia, a country with one of the highest rates of MDR-TB, 19% of MDR-TB cases met the XDR-TB criteria. XDR-TB is particularly lethal for individuals with HIV infection and other immuno-suppressive conditions. In a small South Africa study, 98% of XDR-TB patients died within an average 25 days, and 85% of them were co-infected with HIV.

In October 2006, WHO defined XDR-TB as resistant to:

- isoniazid and rifampin AND
- any fluoroquinolone AND
- one second-line injectable drug (amikacin or capreomycin or kanamycin)

Irrespective of susceptibility, TB bacilli are released into the air when a person with pulmonary or laryngeal TB disease coughs, sneezes, speaks, or sings. TB bacteria can remain suspended in air for several hours, depending on environmental factors, and can infect persons who breathe contaminated air. Drug-resistant TB can be acquired by exposure to an individual infected with a drug-resistant strain of TB or by infection with a susceptible TB strain that develops into a drug-resistant strain due to chemotherapy misuse or mismanagement.

Health care providers can help to prevent the development of drug-resistant TB by:

- Thinking about TB in the differential diagnosis for patients with risk factors for TB exposure or risk factors for developing TB if they are infected, regardless of when the infection took place (such as our elderly U.S.-born population or individuals who lived or traveled to areas of the world with high rates of TB).
- Avoiding the use of medications which have some activity against TB (e.g. fluoroquinolones such as Levoquin and Avalox) if there is any possibility of TB illness in a patient.
- Promptly reporting active and suspect-active cases of TB to Boulder County Public Health (BCPH).

BCPH investigates reported cases to ensure that each active TB patient receives Directly Observed Therapy (DOT), and contacts can be examined quickly and started on appropriate therapy. DOT, which is mandated by Colorado law, involves a health care provider who directly observes every single dose of medication taken by a person with active TB disease.

To report suspect and active cases within the county or for consultation, please contact Carolyn Bargman, TB nurse and case manager, by email or phone: [cbargman@co.boulder.co.us](mailto:cbargman@co.boulder.co.us), 303-413-7516, or [cbargman@dhha.org](mailto:cbargman@dhha.org), 303-436-7298.

### References

1. World Health Organization. *Emergence of XDR-TB: WHO concern over extensive drug resistant TB strains that are virtually untreatable*. September 2006, Geneva. <http://www.who.int/mediacentre/news/notes/2006/np23/en/index.html>. Accessed 6/7/2007.
2. *Morbidity and Mortality Weekly Report. Extensively Drug-Resistant Tuberculosis – U.S. 1993 - 2006*, March 23, 2007/56(11);250-253.
3. Colorado Department of Public Health and Environment. *State of Colorado Rules and Regulations Pertaining to Epidemic and Communicable Disease Control*. <http://www.cdphe.state.co.us/regulations/diseasecontrol/100901epidemiccommunicablediseasecontrol.pdf>. Accessed 6/7/2007.
4. New Jersey Medical School Global Tuberculosis Institute. *A History of Tuberculosis Treatment*. <http://www.umdnj.edu/ntbcweb/tbhistory.htm>. Accessed 6/11/2007.





# Zoster Vaccine

In May 2006, the U.S. Food and Drug Administration approved and licensed Zostavax, a new vaccine manufactured by Merck to reduce the risk of herpes zoster (shingles) in people 60 years of age and older. The vaccine is not indicated as a treatment for zoster or postherpetic neuralgia. Shingles develops in approximately 30% of people over a lifetime. This summary compares the use of the vaccine with varicella, which also targets the varicella-zoster virus but is recommended to be given routinely two times during childhood (at 12-15 months of age and a second dose at 4-6 years) to prevent primary infection with chickenpox.

Zostavax is a live, attenuated virus vaccine that is stored frozen (+5°F) and reconstituted to a dose of 0.65mL. It is administered as a single, subcutaneous injection in the deltoid. The product contains no preservatives. It is prepared by introduction of varicella-zoster virus into human embryonic lung cell cultures, followed by adaptation in embryonic guinea pig cell cultures and propagation in human diploid cell cultures.

The risk of developing shingles appears to be related to a decline in varicella-zoster-specific immunity, and Zostavax boosts cell-mediated immunity against the virus. In a 3-year follow-up, placebo-controlled, double-blind clinical trial, overall vaccine efficacy was 51% for all persons  $\geq$  60 years and 64% for persons 60-69 years of age.

It is estimated that 40% of persons  $\geq$ 60 years of age who have shingles have a complication called postherpetic neuralgia, which persists after the resolution of the zoster rash and may last for weeks or months or longer. Antiviral therapy may decrease zoster-associated pain, but it does not prevent the development of postherpetic neuralgia. The incidence of postherpetic neuralgia was 67% lower among clinical trial subjects who received the vaccine compared to those who received a placebo. The duration and degree of neuralgia were statistically significantly lower in vaccine recipients.

There were no significant differences between the vaccine and placebo recipients in the occurrence of serious adverse reactions in the first 42 days. It has been just over a year since Zostavax was licensed, so the potential risk

for rare adverse reactions is unknown. The vaccine is not licensed for use in immuno-compromised persons (who may be at increased risk for the development of herpes zoster), and the vaccine efficacy in persons who have previously had shingles has not been studied. Transmission of the virus between a vaccinee who develops a post-vaccination rash and a susceptible contact has not been reported. The theoretical risk of transmission by a vaccinee should be weighed against the risk of developing natural zoster that could be transmitted.

The two varicella-containing vaccines administered to children (Varivax and ProQuad) cannot be used to prevent shingles, because the titers of live, attenuated virus in these vaccines are significantly lower than in Zostavax (1,350 plaque-forming units in Varivax compared to 19,400 in Zostavax). The childhood vaccines, therefore, are of insufficient potency to boost cell-mediated immunity in persons  $\geq$ 60 years. Conversely, Zostavax should not be used in children.

In October 2006, the Advisory Committee on Immunization Practices (ACIP) of the CDC voted to recommend a single dose of Zostavax to immuno-competent persons  $\geq$ 60 years whether or not they have had a previous episode of herpes zoster. Formal guidance from the ACIP has not been published.

## References

1. U.S. Food and Drug Administration. Product Approval Information—Licensing Action. Zostavax. Available from URL: <http://www.fda.gov/cber/products/zosmer052506.htm>
2. Kimberlin DW and Whitley RJ. Varicella-Zoster Vaccine for the Prevention of Herpes Zoster. NEJM 2007; 356:1338-43.
3. CDC. ACIP Provisional Recommendations for the Use of Zoster Vaccine. October 25, 2006. Available from URL: <http://www.cdc.gov/nip/recs/provisional/recs/zoster-11-20-06.pdf>

## Epi-Eye

### *A Look Outside Our Community and Around the World*

Francis J. Curry National Tuberculosis Center  
Denver Public Health Department  
and  
Colorado Dept. of Public Health and Environment  
Present

### **TB Update: Clinical and Programmatic Issues in TB Control**

Tuesday, October 9, 2007

8:30 a.m. to 5:30 p.m.

Denver, Colorado

Topics include:

- Epidemiology
- Tuberculosis Case Management
- Targeted Testing and Treatment of LTBI
- Contact Investigation Basics and Case Studies
- Diagnostics Update
- Strategies to Prevent and Treat MDR/XDR-TB
- Special Situations in TB Treatment
- Legal Issues, Case Reporting, and Public/Private Coordination of Care

Applications will be available July 18, 2007 at  
[www.nationaltbcenter.edu](http://www.nationaltbcenter.edu)