Antibiotic Commonsense

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Tuberculosis

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Burden of tuberculosis

Throughout history, tuberculosis (TB) has caused more deaths worldwide than any other infectious disease. Twenty-five percent of the world's population has latent infection with *Mycobacterium tuberculosis* (Mtb), the bacteria that causes TB, and is at risk for developing TB disease. In 2016, 10.4 million people around the world became sick with TB disease and 1.7 million died.[1]

1 in 4 people worldwide has latent tuberculosis infection

In 2017, 9,093 new TB cases were reported in the United States, the lowest case count on record.[1] To control TB, people with active TB must be identified and treated. Curing drug-susceptible TB requires a relatively inexpensive 6-month, 4-drug treatment regimen.

We ensure all Pierce County TB patients adhere to their treatment regimen by providing nursing case management and directly observed therapy (DOT). DOT is the standard of TB care in the United States and is extremely effective in supporting patients completing their treatment regimen.[2]

Standard first-line treatment for active tuberculosis

6-month regimen:

- Isoniazid (INH)
- Pyrazinamide (PZA)
- Rifampin (RIF)
- Ethambutol (EMB)

Drug-resistant tuberculosis

Drug-resistant TB can develop when patients take medications incorrectly, don't finish the full course of treatment, can't take medications due to malabsorption or drug toxicity or when healthcare providers don't prescribe adequate treatment duration or correct drugs. Worldwide, about 480,000 people develop multi-drug-resistant TB (MDR-TB) and only about half of those are successfully treated. MDR-TB treatment is much longer—usually about 2 years—and more expensive.[3,4] These medications cause more serious side effects, including liver toxicity and hearing loss. Extensively drug-resistant TB (XDR-TB) is rare but very concerning, because it is resistant to most drugs used to treat TB.

Twenty percent of people with previously treated TB have MDR-TB. Inadequate treatment likely caused drug resistance in these cases. However, an estimated 3.7% of people with newly diagnosed TB have MDR-TB, ostensibly after exposure to drug-resistant bacteria. People with pulmonary infectious drug-resistant TB can spread drug-resistant TB, a very serious problem in countries where drug resistance is common. Nearly half of the world's MDR-TB cases are in India (24%), China (13%) and Russia (10%). Depending on the geographic area, an average of 9% of people with MDR-TB have additional resistance that meets criteria for XDR.[5]

MDR-TB

Multi-drug-resistant tuberculosis

Resistant to at least isoniazid and rifampin

XDR-TB

Extensively drug-resistant tuberculosis

MDR-TB plus resistant to any fluoroquinolone and at least 1 of 3 injectable tuberculosis drugs

Compared with drug-susceptible TB, MDR-TB causes greater morbidity and mortality. Mortality rates for MDR-TB patients usually exceed 10% (range: 8-21%). Treatment failure, relapse and disability is much more common in MDR-TB patients. For patients with contagious pulmonary TB disease, isolation periods to prevent transmission are usually much longer and patients suffer economic and psychological distress because they can't work or spend time in the community until they are no longer contagious.

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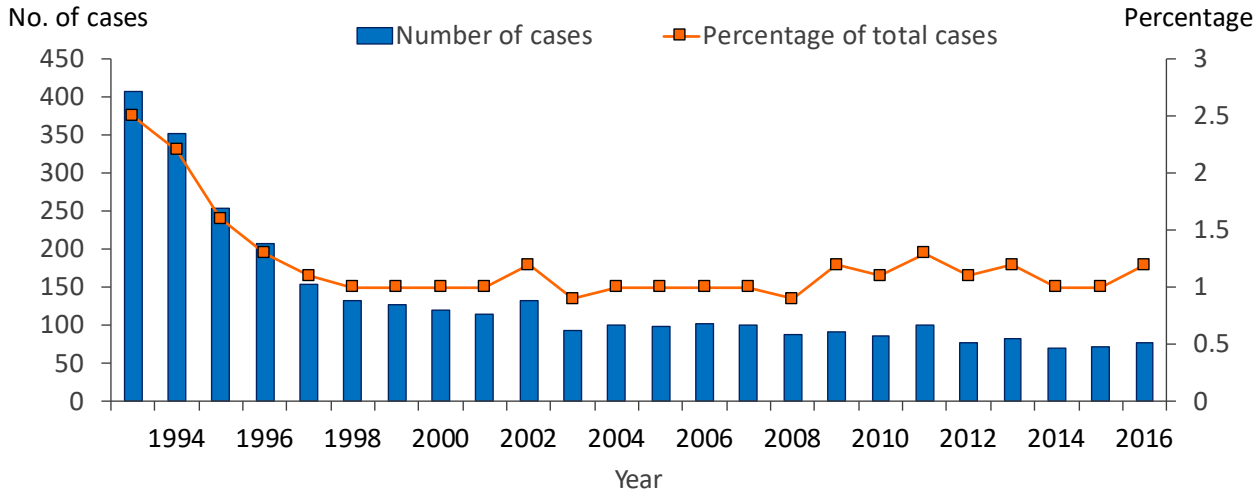
Primary MDR-TB, United States, 1993-2017*



*Based on initial isolates from people with no prior history of TB. MDR-TB is defined as resistance to at least isoniazid and rifampin.
Source: www.cdc.gov/tb/statistics/surv/surv2016

MDR-TB is a rare condition in the United States. About 100 cases are reported each year. We have managed 3 MDR-TB cases since 2016. These cases were difficult and expensive to manage and treat. Our last MDR-TB patient was treated for 2 years. The person required a peripherally inserted central catheter (PICC) line and a daily nurse visit to inject intravenous (IV) medications over a 4-month period. A 1-month supply of injectable and oral MDR-TB medications cost an average of $13,000—compared to $1,000 for drug-susceptible TB medications. Aside from the financial cost, this very serious disease takes a physical and emotional toll on patients. Thankfully, all of our MDR-TB patients were cured and have recovered.

What can you do?

We manage 15-25 cases of active TB disease in Pierce County each year and we do occasionally see a person with drug-resistant TB. Please help us control TB in our community by doing the following.

- Quickly diagnose and report suspected TB cases to the Health Department. Patients who have symptoms of active TB—especially if they come from a high-prevalence area—should be evaluated for TB. Symptoms include unexplained cough, weight loss, anorexia, night sweats, fever and fatigue. Pulmonary TB symptoms include persistent cough, hemoptysis and chest pain. Symptoms of non-pulmonary disease depend on the disease site.
- When possible, use the Gene Xpert Mtb/RIF sputum test, currently available only at CHI Franciscan for inpatient use. The test is used to diagnose hospital inpatients or clear them from isolation. Results are available in about 3 hours and can detect Mtb and the presence of rifampin resistance.
- Screen asymptomatic people from high-prevalence areas for latent TB infection (LTBI). If infected, treat for LTBI. Blood tests, called Interferon gamma release assay (IGRA), are now available, easy to interpret and not affected by prior Bacillus Calmette-Guérin (BCG) vaccine. Locally, QuantiFeron-TB Gold® is available through Laboratories Northwest, Lab Corp and Quest.
- Treat LTBI to prevent development of active TB disease. There are 3 regimens available to treat LTBI. For full treatment guidelines, see www.cdc.gov/tb/publications/ltbi/treatment.

For more information about TB or to report a suspected case, call (253) 798-6410.

References

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