CD Summary

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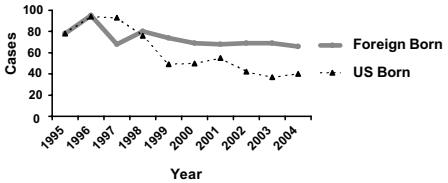
DEMYSTIFYING TREATMENT OF TUBERCULOSIS

While overall tuberculosis (TB) incidence in Oregon has declined since 1990, further reductions will be more difficult. Effective treatment requires sustained adherence to prolonged and complicated regimens of multiple antimicrobials. Treating new cases will become more difficult because, increasingly, TB in Oregon is disproportionately found in hard-to-reach populations. In addition, as incidence declines, important details of treatment fade from clinicians' memories. In this *CD Summary* we review highlights of recent TB epidemiology in Oregon; DOT (directly observed therapy); the essential role of your local health department (LHD); and recommended chemotherapy regimens and guiding principles. Except where otherwise noted, treatment recommendations and data regarding outcomes are derived from the 2003 TB treatment guidelines published by the Centers for Disease Control and Prevention (available at: *http://iier.isciii.es/mmwr/PDF/rr/rr5211.pdf*).[1] This summary addresses symptomatic, or active TB disease. Latent TB infection such as a positive tuberculin skin test without active disease requires different treatment and will not be covered here.[2]

TUBERCULOSIS IN OREGON

During the past decade, TB incidence in Oregon declined by 35%, from an annual average of 5.2 cases per 100,000 population during the 1990s to 3.3 during 2000–2004. Despite overall declines, cases reported among foreign-born persons remained constant (see figure). Reflecting national trends, since 2000, foreign-born cases in Oregon account for 60% of all reported cases compared to 50% during 1995–1999. In addition 13% of all cases occur among homeless persons. Not surprisingly, some population centers in the central and northwestern counties have a disproportionate TB burden, in part because of larger immigrant and homeless populations (see table). (Additional epidemiological details can be found at: *http://www.oregon.gov/DHS/ph/tb/epi.shtml*).

Tuberculosis Cases by Location of Birth, Oregon 2000–2004



Tuberculosis Cases and Incidence by County Oregon, 2004

County	Cases	Incidence (per 100,000)
Multnomah	47	6.9
Marion	16	5.4
Washington	15	3.1
Lane	8	2.4
(All Other Counties)	20	1.1

DOT, DOT, DOT…

Diligent adherence to a prolonged antimicrobial regimen required for successful TB treatment is difficult under optimal conditions. Since we cannot reliably predict which patients are most likely to adhere to their medical regimens, DOT is now recommended for *all* patients with TB. DOT means providing anti-TB drugs to patients and watching as they swallow the medicine. A review of 27 treatment studies found that TB treatment completion rates were 61% for non-supervised therapy and 86% for DOT.

DOT should be delivered via a patient-centered approach in which patient and healthcare professionals collaborate in the development of a treatment plan that anticipates individual obstacles to care and incorporates incentives and enablers. These might include treatment plans and explanations in native languages, transportation assistance, or subsidized food or housing during treatment. Median treatment completion rates for such "enhanced DOT" are 91%.

ROLE OF THE LOCAL HEALTH DEPARTMENT

Last time we checked, housing subsidies, bus vouchers and trips to the hinterlands to watch patients swallow pills weren't regular activities for most clinicians. Fortunately, your LHD can help. By law, physicians and laboratories must report all suspected and confirmed TB cases to the LHD. Subsequently, a nurse case-manager is assigned to each patient, and you may either elect to transfer responsibility for management to the LHD, or accept it yourself. If you choose to manage treatment, you must be prepared to accept responsibility for shepherding the patient successfully through treatment. In either case, LHDs provide essential assistance (see box).

TB Treatment Services Available Through Local Health Departments

- Case management (all cases)
- Contact tracing (all cases)
- Treatment of latent TB infection (negotiable in cases where risk of active TB disease is substantial)
- Medications (negotiable)
- Laboratory services (sputum smears and cultures—all cases; other laboratory tests—negotiable)
- X-ray (negotiable)
- Clinical visits (when LHD supervises management)
- DOT (all cases)
- Anticipatory assistance with social, cultural and financial barriers to care (most cases)

RECOMMENDED CHEMOTHERAPY REGIMENS AND GUIDING PRINCIPLES

Currently recommended, evidence-based regimens for treatment of active TB are the result of systematically compared regimens among thousands of patients and should be followed whenever possible. (See treatment algorithm, *verso*.) Further details, including recommendations for treatment of disseminated disease, resistant strains, and TB in

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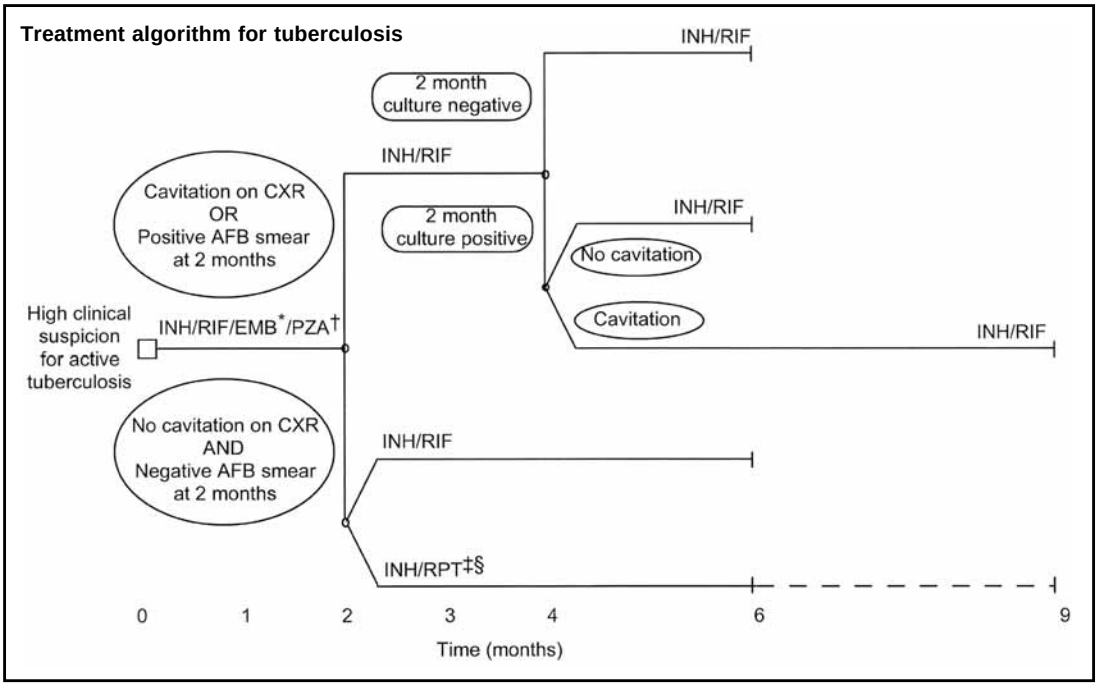
special populations can be found in the aforementioned treatment guidelines.[1] Whenever questions arise, consult your LHD or state TB program.

GUIDING PRINCIPLES

Treating uncomplicated TB usually takes 6 months. The first phase, sometimes called the early bactericidal phase, consists of four drugs (isoniazid, ethambutol, pyrizinamide, and rifampin) for the first 2 months when the goal is to kill large numbers of rapidly growing extracellular bacilli. Because many replicating bacilli are present during this period, the likelihood of a random mutation conferring resistance to one or more drugs is significant. Four drugs are needed to discourage selection of a resistant strain and to kill any populations already present with multidrug resistance. During the second phase of treatment, also known as the sterilization or continuation phase, two drugs (usually isoniazid and rifampin) are used for four or six months. During this phase, overall bacillary load is reduced, appearance of antimicrobial resistance is less likely, and the goal is to kill all remaining stubborn, semi-dormant bacteria.[3]

Evaluation of the success or failure of treatment is necessary at several points. Sputum for smear and culture should be collected at the outset of treatment to establish infectiousness and antibiotic sensitivity, and periodically thereafter to monitor effects of therapy and inform duration of the sterilization phase. If relapse is suspected after completion of treatment, additional cultures should be collected. In patients with pulmonary TB, positive sputum culture at ⩾2 months is present in 15% of patients and necessitates a 6-month continuation phase (total course of treatment: 9 months) when pulmonary cavitation is present. (See treatment algorithm.) A persistent positive sputum culture after 4 months of continuous treatment constitutes treatment failure, and requires comprehensive reevaluation of the treatment plan and consultation with the LHD and state TB program.

Treatment algorithm for tuberculosis



Adapted from: Centers for Disease Control and Prevention. Treatment of Tuberculosis, American Thoracic Society, CDC, and Infectious Diseases Society of America. MMWR 2003;52 (No. RR-11):1–77

Abbreviations: Ethambutol—EMB; Isoniazid—INH; Pyrazinamide—PZA; Rifampin—RIF; Rifapentine—RPT

* EMB may be discontinued when results of drug susceptibility testing indicate no drug resistance.

† PZA may be discontinued after it has been taken for 2 months.

‡ RPT should not be used in HIV-infected patients with tuberculosis or in patients with extrapulmonary tuberculosis.

§ Therapy should be extended to 9 months if 2-month culture is positive.

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3. Reichman LB, Hershfield ES, eds. Tuberculosis: a comprehensive international approach. New York: Marcel Dekker, Inc.; 2000.