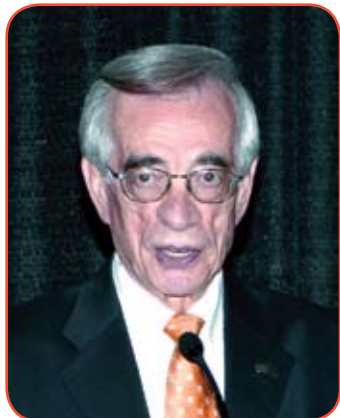
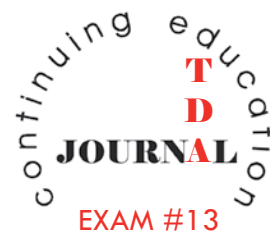


# Tuberculosis in Your Dental Practice: Can it Happen ?

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Can tuberculosis be a factor in your dental practice ? Can an employee be skin test positive and not know about it ? Can an HIV patient be more susceptible to tuberculosis ?

If you answered all of these “yes”, you are correct! In taking a look at tuberculosis (TB) and its influence on dentistry, one must go back and describe the disease itself to get a better understanding of its impact. TB is a chronic infectious disease that is worldwide in distribution. It also is a disease of antiquity having been found in the bones of Egyptian mummies. In the 1700’s, TB was given the name *consumption* due to its ability to consume the body with the disease. Doctor Robert Koch discovered a staining technique that enabled him to identify the tubercle bacillus causative organism *Mycobacterium tuberculosis*. Still, the disease was uncontrolled and many sanatoria specifically for this dread epidemic disease were functioning across the world. In the late 1800’s, Wilhelm Konrad von Roentgen discovered radiation and the progress of this disease could be followed. There were no successful therapies until the early 1940’s with the discovery of streptomycin. When first administered to a TB patient, a dramatic improvement was noted and the disease was visibly arrested. This occurrence led to the discovery of many

newer anti-TB drugs. TB continues to occur in epidemic proportions and is estimated by the World Health Organization to infect approximately nine million people annually.<sup>1</sup> About ninety-five percent (95%) of these cases live in developing countries. The estimated death rate in 2007 was 1.3 million people. In 2008 the TB infection rate in foreign-born persons in the United States was ten times that of persons who were born in the United States.<sup>2</sup> The rates of infection are more predominant in Hispanics, blacks and Asians than whites.

TB is an infectious disease and primarily affects the lungs but is also capable of involving almost any site in the body including the oral cavity. It is aerobically spread from person to person and it is generally necessary to have repeated contact for its transmission. The small TB bacterial size (1-5 um) is such that the organism may stay suspended in the air for several hours. When inhaled into the lungs the organism in a susceptible person produces an initial infection that in the majority of those affected will undergo an immune response from the body and become latent in the lung tissue. These organisms may not produce the full-blown TB disease and in many cases will cause no health problems for the patient. This is called latent TB infection and may only become evident when the person is tested for TB. If the person has a compromised immune system, the person may develop the full blown infection within weeks. If a tuberculin skin test (TST) is positive, it may be the only time the person is aware of the presence of the latent TB infection. If not treated for the latent infection, the person may develop active TB later in life. For those who have been infected and not treated for latent TB, only about five percent (5%) will develop active TB within the first two years. Another five percent (5%) will develop the disease

later in life. Therefore, approximately ninety percent (90%) of those born in the United States with latent TB infection will not progress to active infection nor be able to infect others.<sup>3</sup> There are several tuberculin skin tests but the preferred one is the Mantoux test.<sup>4</sup> A possible problem in skin testing lies with the person who has previously received the *Bacille Calmette-Guerin* (BCG) vaccine. It is used as a preventive in children in many parts of the world and is derived from an atypical mycobacterium. It is not used in the United States. Persons having had the BCG vaccine will most likely show positive TST’s and this produces confusion as to the presence of TB. BCG does not protect adults from the TB bacillus.

Symptoms of TB disease vary considerably but may be a manifestation of one or more of the following.

- Persistent cough
- Weight loss
- Constant fatigue
- Night sweats
- Fever
- Loss of appetite
- Coughing up blood

Persons with TB infection may not show any symptoms or signs.

If a person suspects they have been exposed to TB they should consult their physician for testing. If skin testing is positive, additional testing is necessary and may consist of chest x-rays and other tests the physician may deem necessary and preventive therapy to eliminate the residual TB bacilli in the lungs. This therapy generally is daily doses of INH (isoniazid) for up to a year with periodic checkups.

If a person is diagnosed with active TB disease, the physician will do more extensive testing such as sputum tests, blood tests, additional x-rays and medication generally consisting of combinations of isoniazid, rifampin, pyrazinamide and ethambutol. These

therapies must be followed correctly or the patient will very likely become sick again and have the capacity to infect others. Incomplete therapy may also lead to the development of drug resistance to the offending TB bacillus. Many public health authorities recommend Directly Observed Therapy (DOT)<sup>5</sup>, whereby the patient is directly observed by a health care worker to assure compliance.

Without complete compliance in therapy of TB disease, multi-drug resistant tuberculosis (MDR-TB) may well develop and produce a much more virulent form of TB that does not respond to the most effective drugs.

In dentistry, the incidence of exposure to an active TB patient is quite low. Oral lesions of TB are uncommon, with most cases appearing as a chronic painless ulcer.<sup>6</sup> This does not mean that the dental health care worker should not concern themselves with good diagnostic and preventive measures and realization that patients and other HCW's may be infected with TB.

**Example:** Recently, a Tennessee dentist who provides hospital dentistry had a new employee screened by the hospital for approval to assist the dentist. Her tuberculin skin test was positive and she was referred to her physician for follow up care. The routine follow-up for this scenario is to have a chest film and INH therapy for several months to a year if not positive for active TB. The dentist's concern after this incident was how many employees of dental offices may be skin test positive and not know it.

The Centers for Disease Control and Prevention has stated that because of the potential for transmission of *M. tuberculosis* exists in outpatient settings, dental practices should develop a TB control program appropriate to their level of risk based on the following guidelines:

- A community risk assessment should be conducted periodically and TB infection-control policies for each dental setting should be based on the risk assessment. The policies should include provisions for detection and referral of patients who might have undiagnosed active TB; management of patients with active TB who require urgent dental care; and Dental Health Care Provider (DHCP)

education, counseling, and TST screening.

*Addendum: Community risk assessment data may be obtained from the local health department.*

- DHCP who have contact with patients should have a baseline TST, preferably by using a two-step test at the beginning of employment. The facility's level of TB risk will determine the need for routine follow-up TST.
- While taking patients' initial medical histories and at periodic updates, DHCP should routinely ask all patients whether they have a history of TB disease or symptoms indicative of TB.
- Patients with a medical history or symptoms indicative of undiagnosed active TB should be referred promptly for medical evaluation to determine possible infectiousness. Such patients should not remain in the dental-care facility any longer than required to evaluate their dental condition and arrange a referral. While in the dental health-care facility, the patient should be isolated from other patients and DHCP, wear a surgical mask when not being evaluated, or be instructed to cover their mouth and nose when coughing or sneezing.
- Elective dental treatment should be deferred until a physician confirms that a patient does not have infectious TB, or if the patient is diagnosed with active TB disease, until confirmed the patient is no longer infectious.
- If urgent dental care is provided for a patient who has, or is suspected of having active TB disease, the care should be provided in a facility (e.g., hospital) that provides airborne infection isolation (i.e., using such engineering controls as TB isolation rooms, negatively pressured relative to the corridors, with air either exhausted to the outside or HEPA-filtered if recirculation is necessary). Standard surgical facemasks do not protect against TB transmission; DHCP should use respiratory protection (e.g., fit-tested, disposable N-95 respirators).
- Settings that do not require use of respiratory protection because they do not treat active TB patients and do not perform cough-inducing procedures

on potential active TB patients do not need to develop a written respiratory protection program.

- Any DHCP with a persistent cough (i.e., lasting >3 weeks), especially in the presence of other signs or symptoms compatible with active TB (e.g., weight loss, night sweats, fatigue, bloody sputum, anorexia, or fever), should be evaluated promptly. The DHCP should not return to the workplace until a diagnosis of TB has been excluded or the DHCP is on therapy and a physician has determined that the DHCP is noninfectious.<sup>3</sup>

It is important to note that these recommendations include that any dental health care worker who has patient contact should have a baseline TST. The frequency of routine follow-up testing should be established on the facilities TB risk assessment. It is not unusual that a dental office may decide to provide an annual TST for their employees.

Tuberculosis is not a common occurrence in dental offices but the dental team should be aware of its potential and the issues now associated with the occurrence of active TB in patients who have immune disorders, particularly those with HIV or AIDS. The rate of tuberculosis in HIV-infected, TST positive persons was 200-800 times higher than the rate of TB estimated for the U.S. population overall and eight to twenty-six (8-26) times more prevalent than those HIV- infected with TST negative results.<sup>7</sup> It is important for all DHCW's to be aware of this.

The challenge to dentistry is to be prepared for all infectious diseases that may affect the practice.

#### REFERENCES

1. Global Tuberculosis, Control, Epidemiology, Strategy and Financing, World Health Organization (WHO) Report, 2009
2. Trends in Tuberculosis – United States, MMWR Weekly, March 20, 2009/ 58(10) ; 249-253
3. Guidelines for Infection Control in Dental Health Care Settings 2003, MMWR Vol.52/RR17
4. Centers for Disease Control and Prevention, Mantoux Skin Test, Training Materials Kit (2003)
5. World Health Organization, Fact Sheet No. 104, March 2007
6. Neville, Damm, Allen, Bouquet; Oral and Maxillofacial Pathology, third edition, Sanders, p.196
7. Prevention and Treatment of Tuberculosis among patients infected with human immunodeficiency virus: principles of therapy and revised recommendations, MMWR 1998 ; 47 (No. RR-20)

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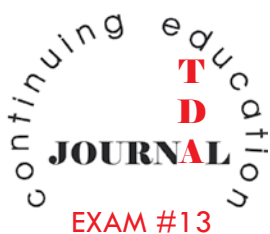
## Questions for Continuing Education Article - CE Exam #13

1. A generic name given tuberculosis in the 1700's was:
  - a. Gluttony
  - b. Dropsy
  - c. Consumption
  - d. Constitution
2. Approximately what percentage of all cases of tuberculosis occur in the United States?
  - a. 25%
  - b. 10%
  - c. 2%
  - d. 5%
3. The major organ affected by tuberculosis is the:
  - a. Lung
  - b. Heart
  - c. Kidney
  - d. Liver
4. One of the following is not a sign or symptom of active tuberculosis:
  - a. Night sweats
  - b. Fever
  - c. Increased appetite
  - d. Weight loss
5. Latent tuberculosis is most often identified by:
  - a. Skin testing
  - b. Chest x-ray
  - c. Sputum testing
  - d. Weight loss
6. The most common cause of multi-drug resistant tuberculosis is:
  - a. Over medication
  - b. Misdiagnosis
  - c. Incomplete therapy
  - d. Non compliant exercise therapy
7. Which of the following drugs is most commonly utilized when a patient is diagnosed with latent tuberculosis ?
  - a. Pyrazinamide
  - b. Isoniazid
  - c. Ethambutol
  - d. Rifampin
8. The CDC recommends to Dental Health Care Providers:
  - a. Have a baseline TST at the beginning of employment
  - b. That a baseline TST is not necessary
  - c. Only the dentist be tested for baseline
  - d. Don't worry because the incidence is so low
9. Active TB patients seen in the dental office:
  - a. Should be treated as any other patient
  - b. Can be treated for emergency care in the office
  - c. Should not be isolated from other patients
  - d. Should be declared as non-infectious before office treatment
10. A community risk assessment for tuberculosis incidence can be obtained from the local:
  - a. Physician
  - b. Health department
  - c. Fire department
  - d. Air quality report

*See the Answer Form on the next page and follow all instructions regarding submission of TDA Continuing Education Exam #13 for credit*

# Answer Form for TDA CE Credit Exam #13: *Tuberculosis in Your Dental Practice: Can it Happen ?*

Circle the correct letter answer for each CE Exam question:



1.	a	b	c	d	6.	a	b	c	d
2.	a	b	c	d	7.	a	b	c	d
3.	a	b	c	d	8.	a	b	c	d
4.	a	b	c	d	9.	a	b	c	d
5.	a	b	c	d	10.	a	b	c	d

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