1*.***Agent:** *Mycobacterium tuberculosis* complex. This includes *M. tuberculosis, M. africanum, M canettii*, all primarily from humans, *M. bovis* primarily from cattle, and *M. microti.* Occassionally, *M. caprae*, *M. pinnipedii*, *M. mungi*, and *M. orygis* cause disease that is clinically indistinguishable from *M. tuberculosis*.

1. **Symptoms:** There are 2 forms of infection- latent or active (which is subcategorized into pulmonary and extra pulmonary TB).The initial latent infection usually goes unnoticed. Early lung lesions commonly heal leaving no residual changes except occasional pulmonary or tracheobronchial lymph node calcifications. About 10% of those initially infected eventually develop active disease, half of them during the first 2 years following infection. 90% of untreated infected individuals will never develop active TB. Appropriate completion of treatment for latent TB infection (LTBI) can considerably reduce the lifetime risk of clinical tuberculosis. In some individuals, initial infection may progress rapidly to active tuberculosis. This is more common in immunosuppressed individuals (i.e. HIV positive) and among infants where the disease is often disseminated (i.e. miliary) or meningeal.

**Pulmonary TB** is characterized by fatigue, fever, night sweats, weight loss, cough, chest pain, hemoptysis (coughing up blood), and hoarseness. Affected individuals can also be asymptomatic.

**Extra Pulmonary TB** occurs less commonly (15-30% of cases) than pulmonary TB (70%). TB may affect any organ system or tissue: central nervous system, lymph nodes, pleura, pericardium, kidneys, bones and joints, larynx, middle ear, skin, intestines, peritoneum, and eyes.

1. **Incubation:** From infection to demonstrable primary lesion or significant tuberculin reaction (or latent TB), about

2 to 10 weeks. While the subsequent risk of progressive pulmonary or extra pulmonary TB is greatest within the 1st or 2nd year after initial infection, latent infection may persist for a lifetime. Tuberculin reactivity also persists regardless of treatment. HIV infection increases the risk and shortens the interval for the development of TB disease following infection.

1. **Reservoir:** Primarily humans, rarely primates. In some areas, diseased cattle, badgers, swine and other mammals are infected.
2. **Source:** Pulmonary in the vast majority of cases, although aerosolization of organisms during irrigation of cutaneous lesions or at autopsy has been reported. Unpasteurized milk, also.
3. **Transmission:** Via exposure to tubercle bacilli in airborne droplet nuclei, produced by people with pulmonary or respiratory tract tuberculosis during coughing, sneezing, talking, or singing. Direct invasion through mucous membranes or breaks in the skin may occur but is rare. Except for rare situations where there is a draining sinus, extra pulmonary tuberculosis (other than laryngealwhich is highly contagious) is generally not communicable. Contact with a tuberculous bovine (or their products) can also transmit *M. bovis*.
4. **Communicability:** Theoretically, as long as viable tubercle bacilli are present in the sputum. Effective antimicrobial chemotherapy usually eliminates communicability within 2- 4 weeks, at least in household settings, even though TB bacteria may still grow in culture from expectorated sputum. Children with primary tuberculosis are generally not infectious. Laryngeal TB is rare but is highly contagious.
5. **Treatment: Latent TB infection (LTBI):** Isoniazid (INH) for 9 months or Rifampin for 4 months or Rifapentine and INH for 12 weeks is usually recommended and is effective in preventing the progression of LTBI to active TB disease in up to 90% of compliant individuals.

For dosing guidelines please refer to [CTCA Drug Regimens for Culture-Positive Pulmonary TB and First-Line Drugs for TB Disease](Current%20Documents/Hyperlinks%20for%20TB%20Overview%20Document/CTCA%20Dosing%20Guidelines.pdf)

Patients with active **TB disease** must be given prompt treatment with an appropriate combination of antimicrobial drugs and sputum smears must be monitored at regular intervals. For most cases of drug- susceptible disease, a 6-month regimen is recommended including isoniazid (INH), rifampicin (RIF), pyrazinamide (PZA), and ethambutol (EMB) for the first 2 months, followed by INH and RIF for the next 4 months. After drug susceptibility results become available, a specific drug regimen can be selected if drug resistant strains are present (e.g. to isoniazid and rifampicin).

For direct observational therapy guidelines please refer to [CTCA/CDPH Joint Guidelines for Directly Observed Therapy Program Protocols in California](Current%20Documents/Hyperlinks%20for%20TB%20Overview%20Document/CTCA%20DOT%20Guidelines.pdf)

1. **Control Measures:** Investigation of contacts and source of infection: Tuberculin skin testing (TST) or IGRA (interferon gamma release assay) of all household members and other close contacts is recommended. If TST is negative, a repeat skin test should be performed 8 to 10 weeks after the exposure has ended. Chest X-rays should be obtained for all positive tests (at least 5 mm of induration) when identified to rule out active pulmonary TB. All persons infected with active pulmonary or active extrapulmonary TB should be counseled and screened for HIV.

**Case:** Isolation. For pulmonary tuberculosis, control of infectivity is best achieved through prompt specific drug treatment, usually leading to sputum conversion within 4 to 8 weeks. Hospitalization is necessary for patients with severe illness and for those whose medical or social circumstances make home-treatment impossible. Patients whose sputum is smear negative, who do not cough, and who are known to be on adequate chemotherapy, do not require isolation. Children with active disease, with negative sputum smears and no cough are not contagious. Quarantine: Not applicable

**Contacts:** In countries such as the United States, where BCG vaccination is not routinely undertaken, treatment of LTBI is usually recommended for persons who are or have been in contact with TB infection and in whom active TB disease has been ruled out.

Treatment for LTBI is also recommended for highest-risk individuals (HIV-infected and those younger than 5 years old), even if the skin test is negative, once active TB has been ruled out.

# Prevention & Education:

* 1. Promptly identify, diagnose and treat potentially infectious patients with TB disease.
  2. Reduce or eliminate social conditions that increase the risk of infection.
  3. Set up TB prevention and control programs in institutional settings where health care is provided and/or where immunocompromised patients such as HIV-infected persons congregate (e.g. hospitals, drug treatment programs, prisons, nursing homes and homeless shelters).
  4. Chemotherapy with INH for treatment of LTBI.
  5. A vaccine does exist, but the USA does not usually vaccinate. It is utilized in other countries. TST tests may show as positive due to BCG vaccination.

# Administrative/Case Management:

* 1. [TB Case Management Process](Current%20Documents/Hyperlinks%20for%20TB%20Overview%20Document/TB%20Case%20Management%20Process.doc)
  2. [TB Case Management Procedure](Current%20Documents/Hyperlinks%20for%20TB%20Overview%20Document/TB%20Case%20Management%20Procedure.docx)
  3. [Supportive Measures](Current%20Documents/Initial%20TB%20Case%20Management%20Documents/Supportive%20Measures.docx)
  4. [Health Officer Order](Current%20Documents/Hyperlinks%20for%20TB%20Overview%20Document/TB%20Health%20Officer%20Order.docx)
  5. [B1/B2 TB Algorithm](Current%20Documents/Hyperlinks%20for%20TB%20Overview%20Document/B1-B2%20TB%20Algorithm.docx)
  6. [Discharge of a Suspect or Confirmed Tuberculosis Patient Instructions (with GOTCH)](Current%20Documents/Hyperlinks%20for%20TB%20Overview%20Document/TB%20DISCHARGE%20INSTRUCTIONS.docx)
  7. [Class B1 and B2 Immigrant Notification and Referral Process](Current%20Documents/Class%20B%20Documents/Draft%20Class%20B%20Immigration%20and%20Notification%20Referral%20Process%20(002).doc)