Pulmonary Tuberculosis Combined with Other Severe Diseases
Extrapulmonary Tuberculosis
Control of Tuberculosis

General Medicine
English Learning Programme
Phthisiology, Lecture #3
## Disease and medical conditions associated with higher risk for developing tuberculosis

<table>
<thead>
<tr>
<th>Condition</th>
<th>Relative risk increase</th>
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<tbody>
<tr>
<td>Silicosis</td>
<td>30-fold</td>
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<tr>
<td>Renal failure</td>
<td>10-26-fold</td>
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<tr>
<td>Diabetes mellitus</td>
<td>2-4-fold</td>
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<tr>
<td>Gastrectomy</td>
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<td>Jejuno-ileal bypass</td>
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<td>Renal or cardiac transplantation</td>
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<td>Carcinoma of the head or neck</td>
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<td>Other neoplasms</td>
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<tr>
<td>BMI&lt;18.5 [kg/m²]</td>
<td>2-3-fold</td>
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<tr>
<td>IV drug users, high alcohol intake</td>
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<tr>
<td>Immunocompromised host (corticosteroids and other immunosuppressants, HIV...)</td>
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<tr>
<td>Chronic malabsorption</td>
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<tr>
<td>Vitamin D deficiency</td>
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<tr>
<td>Anti-TNF-alpha antibodies</td>
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</table>
# HIV infection stage and TB

<table>
<thead>
<tr>
<th></th>
<th>Early (CD4+&gt;200/mm³)</th>
<th>Late (CD4+&lt;200/mm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest XR</td>
<td>upper-lobe infiltrates, cavities</td>
<td>lymphadenomegaly, effusions, miliary, diffuse, normal</td>
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<tr>
<td>Smear+</td>
<td>frequently</td>
<td>less commonly</td>
</tr>
<tr>
<td>PPD+</td>
<td>frequently</td>
<td>less commonly</td>
</tr>
<tr>
<td>Extrapulmonary</td>
<td>less commonly</td>
<td>frequently</td>
</tr>
</tbody>
</table>
FIGURE 2.6  Estimated HIV prevalence in new TB cases, 2011

HIV prevalence (%), all ages

- 0-4
- 5-19
- 20-49
- ≥ 50
- No estimate
- Not applicable
Extrapulmonary Tuberculosis

• 15% of patients with active TB
• more frequent in immunocompromised host
  – lymph nodes
  – pleural space
  – genitourinary tract
  – bones and joints
  – meninges
  – peritoneum and gastrointestinal tract
Tuberculous lymphadenitis

- 25% of extrapulmonary disease
- M. tuberculosis, M. scrofulaceum
- anterior cervical chain
- painless swelling
- initially firm, discrete, later large, fistulous
- biopsy, smear (50% positive) culture (80% positive)
- drugs + surgical intervention
- scarring
Urinary tuberculosis

- dysuria, hematuria, frequent urination, flank discomfort
- fever and constitutional symptoms <10% of patients
- clinically unilateral, histologically bilateral
- "putty kidney"
- sterile pyuria
- morning urine specimen 3 times = 90% sensitivity
- good prognosis
Genital Tuberculosis

- slowly progressive mass in seminal vesicles, prostate, or epididymis

- pelvic pain, abnormal uterine bleeding, irregular menses, amenorrhea, infertility
Muskuloskeletal tuberculosis

- 6% of extrapulmonary disease
- middle-aged, HIV-infected
- lower spine and weight-bearing joints
- spinal cord compression
- “cold abscess”
- surgical intervention
Tuberculous meningitis

- 5% of extrapulmonary disease
- elderly and HIV-infected
- confusion, abnormal behavior, headache, fever, cranial nerve abnormalities, seizures
- rapid progression
- mortality 20%
- CSF analysis: ↑protein, ↓glucose, WBC=100-1000/ml, Ly
- smear: 25% sensitivity, culture: 75% sensitivity
- cortisosteroids
- mortality 20%
Tuberculous pericarditis

- fever, dyspnea, orthopnea, cough, edema
- constitutional symptoms
- pericardial rub absent in 2/3 of patients
- fluid hemorrhagic, similar to pleural fluid
- smear and culture sensitivity 50%
- biopsy
- corticosteroids, surgery
- thickening, calcification
- mortality 80%
Tuberculous gastrointestinal involvement

• most frequently ileocecal involvement
• diarrhea, constitutional symptoms, pain, ascites, fistula
Global targets for TB control

- By 2015: Reduce prevalence and death rates by 50%, compared with their levels in 1990.
- By 2050: Reduce the global incidence of active TB cases to <1 case per 1 million population per year.
The Stop TB Strategy

= approach recommended by WHO to reduce the burden of TB
The stop TB strategy
vision

TB-free world
The stop TB strategy goal

• To dramatically reduce the global burden of TB by 2015 in line with the Millenium Development Goals and the Stop TB Partnership targets
The stop TB strategy objectives

• Achieve universal access to high-quality care for all people with TB.
• Reduce the human suffering and socioeconomic burden associated with TB.
• Protect vulnerable populations from TB, TB-HIV and drug-resistant TB.
• Support development of new tools and enable their timely and effective use.
• Protect and promote human rights in TB prevention, care and control.
The stop TB strategy components I.

1. Pursue high-quality DOTS expansion and enhancement.
   a. Secure political commitment, with adequate and sustained financing.
   b. Ensure early case detection, and diagnosis through quality-assured bacteriology.
   c. Provide standardized treatment with supervision and patient support.
   d. Ensure effective drug supply and management.
   e. Monitor and evaluate performance and impact.
The stop TB strategy components II.

2. Address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations.
   a. Scale-up collaborative TB/HIV activities.
   b. Scale-up prevention and management of multidrug-resistant TB (MDR-TB).
   c. Address the needs of TB contacts, and of poor and vulnerable populations.
3. Contribute to health system strengthening based on primary health care.
   
a. Help improve health policies, human resource development, financing, supplies, service delivery, and information.
   
b. Strengthen infection control in health services, other congregate settings and households.
   
c. Upgrade laboratory networks, and implement the Practical Approach to Lung Health (PAL).
   
d. Adapt successful approaches from other fields and sectors, and foster action on the social determinants of health.
The stop TB strategy components IV.

4. Engage all health care providers.
   a. Involve all public, voluntary, corporate and private providers through Public-Private Mix (PPM) approaches.
   b. Promote use of the International Standards for Tuberculosis Care (ISTC).
The stop TB strategy components V.

5. Empower people with TB, and communities through partnership.
   a. Pursue advocacy, communication and social mobilization.
   b. Foster community participation in TB care, prevention and health promotion.
   c. Promote use of the Patients’ Charter for Tuberculosis Care.
The stop TB strategy components VI.

6. Enable and promote research.
   a. Conduct programme-based operational research.
   b. Advocate for and participate in research to develop new diagnostic, drugs and vaccines.
The global plan to stop TB major targets for 2015 I.

• Dg., notification and treatment of 7 mil. cases.
• A treatment success rate among sputum smear-positive cases of 90%.
• HIV testing of 100% of TB patients.
• Enrolment of 100% of HIV-positive TB patients on cotrimoxazole-preventive therapy (CPT) and antiretroviral therapy (ART).
• Provision of isoniazid preventive therapy (IPT) to all people living with HIV who are attending HIV care services and are considered eligible for IPT.
The global plan to stop TB major targets for 2015 II.

• Treating of 100% of previously treated TB patients for MDR-TB, as well as testing of any new TB patients considered at high risk of having MDR-TB (estimated globally at around 20% of all new TB patients).

• Enrolment of all patients with confirmed diagnosis of MDR-TB on treatment consistent with international guidelines.

• Mobilization of US$ 7 billion per year to finance implementation of the Stop TB Strategy, plus around US$ 1.3 billion per year for research and development related to new drugs, new diagnostic and new vaccines.
Achievements in TB control 1995-2009

- 49 mil. patients were treated in DOTS programmes, of whom 41 mil. successfully.
- TB mortality has fallen > 1/3 since 1990 globally.
- Incidence rate increase was held and reversed in 2004.
- Up to 6 mil. lives were saved through implementation of DOTS and the Stop TB Strategy.
Treatment using short-course chemotherapy

• standardized treatment
• protection of rifampicin
• DOTS
• fixed-dose combination
• at least 3 other drugs in smear +
• prohibition of sale
Uninterrupted supplies of drugs

• list of essential drugs
• drug ordering
  – direct responsibility of the head of the NTP
  – based on the number of cases recorded during previous period
  – buffer stock (3-month reserve stock at basic and intermediate level, 6-month stock at central level)
Regular evaluation of the programme’s activities using a permanent recording and reporting system

• notification register of all tuberculosis cases
• quarterly reports
Implementation of the NTP

• programme manual (definitions, instruction for the diagnosis and treatment)
• development plan (budget)
• reference laboratory (organizing laboratory network, training staff, implementing quality assurance)
• laboratory network (1/100000 inhabitants in rural and 1/300000 inhabitants in urban areas)
• training plan
• supportive visits (supervision)
Structure of the services

• Peripheral level
  – population of 100000
  – unit coordinator
  – microscopy laboratory (laboratory register)
  – patient files

• Intermediate level
  – 8-10 basic units
  – X-rays, microscopy, culture
  – training of staff
  – coordination with other national programmes

• Central level
  – unit attached to the Ministry of Health
  – manager, reference laboratory
  – university hospitals
Directly Observed Therapy (DOT)

- watch patient swallow each dose of medication
- consider DOT for all patients
- DOT should be used with all intermittent regimens
- DOT can lead to reductions in relapse and acquired drug resistance
- Use DOT with other measures to promote adherence
Treatment card

• personal information, ID, address, contact person
• type of disease
• treatment regimen
• follow-up (appointment dates, weight, bacteriology)
• drug administration schedule
Tuberculosis register

• Personal information, initial condition, treatment prescribed, results of the follow-up, bacteriology

• treatment outcome:
  – cured (2 negative examinations)
  – completed (bacteriology was not performed)
  – failure (still positive or positive again after 5th month)
  – died
  – transferred out
  – defaulted (>2 monts)
Reports

• quarterly report on TB case-finding
• quarterly report on the results of treatment