

Revised National Tuberculosis Control Programme (RNTCP)

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The global annual incidence is estimated to be 1.98 million cases in India. This situation is further threatened by emergence of multidrug-resistant tuberculosis. The Revised National Tuberculosis Control Programme is based on Directly Observed Treatment Short-course (DOTS) strategy. DOTS facilitates relapse-free cure for TB. Diagnostic algorithms for pulmonary tuberculosis have been narrated in this article. Treatment of tuberculosis stands on patients' categorisation in 3 groups and schedule is described. The side-effects and their remedies are also narrated. The IMA has a role to join hands with the government to work closely to bring down the disease burden. [J Indian Med Assoc 2010; 108: 868-70]

Key words : Revised National Tuberculosis Control Programme (RNTCP), Antituberculosis drugs, Directly Observed Treatment Short-course (DOTS), IMA.

Tuberculosis (TB) is an infectious disease caused by bacillus *Mycobacterium tuberculosis* that continues to be a major cause of morbidity and mortality. Left untreated a single person with active TB can infect 10-15 others each year. India is the highest TB burden country globally, accounting for one-fifth of the global TB incidence (Fig 1) Global annual incidence estimate is 9.4 million cases out of which it is estimated that 1.98 million cases are from India¹. TB accounts for 17.6% of deaths from communicable disease and for 3.5% of all causes of mortality. The tuberculosis situation in the country is further threatened by the emergence and spread of HIV and multidrug-resistant tuberculosis (MDR-TB).

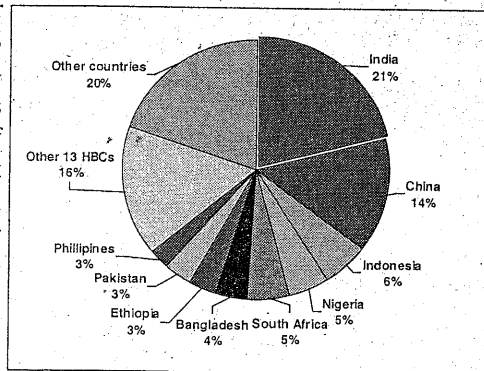


Fig 1 — Worldwide Incidence of Tuberculosis

Transmission of Tuberculosis :

When a sputum-positive pulmonary TB patient coughs or sneezes, he spreads *Mycobacterium tuberculosis* into the air in the form of tiny droplets. If a healthy inhales these tiny particles, he may contract TB. Effective treatment of smear-positive TB patients stops TB at source and is therefore the top priority for control of the disease.

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TB Control Programme in India :

Despite the existence of National Tuberculosis Control Programme, since 1962, no significant epidemiological impact was observed on disease prevalence. In 1992 the

Government of India together with the WHO and Swedish International Development Agency (SIDA) reviewed the national programme and main reasons identified for poor programme functioning was managerial weakness and inadequate funding². As a result the programme was revised. The Revised National TB Control Programme (RNTCP) based on the internationally recommended Directly Observed Treatment Short-course (DOTS) strategy, was launched in 1997 expanded across the country in a phased manner and covered the whole nation by March 2006.

The objectives of the programme are :

- To achieve and maintain cure rate of at least 85% among new sputum positive (NSP) patients.
- To achieve and maintain case detection of at least 70% of the estimated NSP cases in the community.

How to achieve these objectives?

- Political commitment
- ✓ Give priority in the public health programme
- Good diagnosis
- ✓ primarily based on sputum microscopy
- Uninterrupted drug supply
- ✓ ensured by supplying quality drugs in patientwise boxes
- Good treatment
- ✓ based on Directly Observed Treatment-Short course (DOTS)
- Monitoring the patient to cure

✓ by follow-up sputum microscopy

Intermittent Treatment :

It has been proved by clinical trials that thrice-a-week, alternate-day treatment is as effective as daily treatment. The doubling time of *Mycobacterium tuberculosis* is about 18 hours, compared with 10-20 minutes for most bacteria. In animal models, intermittent treatment is more effective than daily treatment, presumably because intermittent dosage allows organisms to re-enter the reproductive phase, in which the bactericidal agents of isoniazid and rifampicin are more effective. Dozens of clinical trials have demonstrated that intermittent treatment is at least as effective as daily treatment. No differences in the number or severity of side-effects had been found, although patients receiving intermittent treatment had less arthralgia. However, alternate-day treatment should only be used in a programme of directly observed treatment so that it can be ensured that the patient completes the full course of treatment and is cured.

What is Directly Observed Treatment (DOT) :

Directly Observed Treatment (DOT) is one of the key elements of the DOTS strategy. In DOT, an observer (health worker or trained community volunteer who is not a family member) watches and supports the patient in taking drugs. The DOT provider ensures that the patient takes the **right drugs, in the right doses, at the right intervals, for the right duration**. DOT thus facilitates relapse-free cure for TB and also helps to reduce development of drug resistance, because direct observation ensures adherence. The country has developed a large network of DOT providers more than 4 lacs, 40% of them being community DOT providers to make DOT most convenient to patients, taking DOT close to their home. The programme is providing an incentive of Rs 250 to the community DOT provider for each patient completing the treatment.

Identification of TB Suspects :

At all outpatient clinics, hospitals and health facilities, both in the public and private sectors, all patients need to be systematically screened for cough by medical officers or health staff manning the health facilities. Persons with cough for 2 weeks, or more, with or without other symptoms suggestive of TB, should be promptly identified as pulmonary TB suspects. The primary tool for diagnosing pulmonary TB is sputum microscopy. It is more specific and has less

inter-reader variability than chest x-ray. The number of sputum specimens required for diagnosis of smear positive pulmonary TB is two, with one of them being a morning sputum specimen¹.

Diagnostic Algorithms for Pulmonary TB:

The diagnostic algorithms of pulmonary tuberculosis are depicted in Fig 2.

Treatment of Tuberculosis :

The tuberculosis patients are categorised in 3 groups for initiation of treatment (Table 1).

Dosage of drugs (Table 2) :

Symptom-based approach to evaluation of possible side-effects of anti-tuberculosis drugs used in RNTCP is depicted in Table 3.

Adverse reactions with short-course chemotherapy regimens are depicted in Table 4.

All the contacts of smear positive patients should be

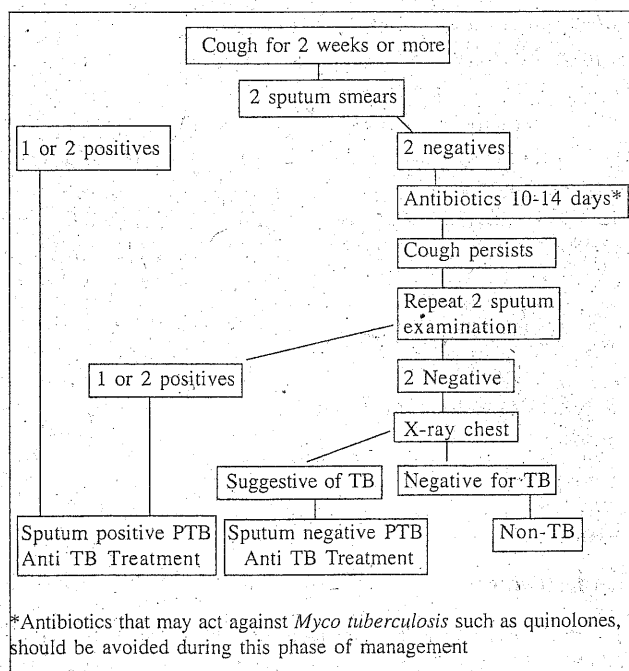


Fig 2 — Showing Diagnostic Algorithms of Pulmonary Tuberculosis

Table 1 — Showing Treatment Schedule

Category	Description	Treatment Schedule
Category I	New smear - positive; seriously ill smear negative; seriously ill extra-pulmonary	2H ₃ R ₃ Z ₃ E ₃ /4H ₃ R ₃
Category II	Previously treated smear-positive (relapse, failure, treatment after default)	2H ₃ R ₃ Z ₃ E ₃ S ₃ /1H ₃ R ₃ Z ₃ E ₃ /5H ₃ R ₃ E ₃
Category III	New smear - negative and extrapulmonary, not seriously ill	2H ₃ R ₃ Z ₃ /4H ₃ R ₃

H-Isoniazid, R-Rifampicin, Z-Pyrazinamide, E-Ethambutol, S-Streptomycin
 The number before the drugs represents the number of months for which a set of drugs are to be taken
 The subscript number after each letter (antibiotic) is the number of times in a week that the drug is to be taken

screened for TB. Children below six years should be given chemoprophylaxis.

Advantages of intermittent treatment:

- As effective as daily treatment
- Facilitates observation
- Prevents concealed irregularity
- Less adverse reactions
- Reduction in total drugs consumed
- Less expensive
- Less number of doses
- Less number of patient visits

Role of IMA :

National IMA has joined hands to work closely with our Government counterparts through the combined efforts of all our IMA members to bring down the disease burden of TB in our country as per Revised National Tuberculosis Control Programme (RNTCP).

Members of IMA are critical to effective tuberculosis control and important in their community as they are trusted by patients. They can help control TB in their community by:

- Ensuring that each and every person with productive cough for 2 weeks or more has two sputum samples

Table 2 — Dosage of Anti-tuberculosis Drugs

Drugs	Dose (three times a week)
Isoniazid	600 mg
Rifampicin	450 mg*
Pyrazinamide	1500 mg
Ethambutol	1200 mg
Streptomycin	0.75 g**

*Patients who weigh 60 kg or more are given an extra 150 mg dose of rifampicin
 **Patients over 50 years of age and those who weigh less than 30 kg are given 0.5 g of streptomycin

the basic tool for diagnosis and monitoring of treatment and recognizing the limited value of X-rays for diagnosis and follow-up of TB

• Referring patients to RNTCP sites for diagnosis and treatment

• Emphasizing to patients the critical importance of regular and complete treatment, and that TB will be cured if complete treatment is taken

• Emphasising the necessity of fully observed, thrice-weekly treatment with standardised therapy in the intensive phase, and once-weekly observation in the continuation phase of treatment

• Following up with all sputum positive TB patients the importance of screening their contacts, and ensure that the symptomatic contacts are evaluated.

• Helping patients and RNTCP staff to identify locations for provision of DOT that are convenient to the patients and providers

• Educating the community about the signs and symptoms of TB and the need to report to DOTS centres if these symptoms occur

• Informing the community at large about the location and availability of quality services for diagnosis and treatment of tuberculosis as well as the fact that all these services are available free of cost

• Educating the community at large about TB to encourage patients to complete treatment, and ensure that TB patients are not rejected by their families or others

Conclusion :

There is an unmet need for improved advocacy, communication and social mobilisation (ACSM) to support ongoing TB control efforts in all districts in the country. If all medical practitioners commit and take keen interest in implementing the RNTCP successfully, tuberculosis can be control effectively in our country.

REFERENCES

- 1 Central TB Division — Diagnosis of smear positive pulmonary TB: new guidelines, effective from 1st April 2009. New Delhi: Directorate of Health Services, Ministry of Health and Family Welfare, 2010.
- 2 World Health Organisation — Joint Tuberculosis Programme Review: India. New Delhi: WHO Regional Office for South East Asia, 2000: WHO/SEA/TB/224.

Table 3 — Showing Side-effects of Anti-tuberculous Drugs and Action to be Taken

Symptom	Drug (abbreviation)	Action to be taken
Drowsiness	Isoniazid (H)	Reassure patient
Red-orange urine/tears	Rifampicin (R)	Reassure patient
Gastrointestinal upset	Any oral medication	Reassure patient Give drugs with less water Give drugs over a longer period of time
Burning in the hands, feet	Isoniazid (H)	Give pyridoxine 100 mg/day until symptoms subside
Joint pains	Pyrazinamide (Z)	If severe, refer patient for evaluation
Impaired vision	Ethambutol (E)	Stop treatment, refer patient for evaluation
ringing in the ears	Streptomycin (S)	Stop streptomycin, refer patient for evaluation
Loss of hearing	Streptomycin (S)	Stop streptomycin, refer patient for evaluation
Dizziness, loss of balance	Streptomycin (S)	Stop streptomycin, refer patient for evaluation
Jaundice	Isoniazid (H) Rifampicin (R) Pyrazinamide (Z)	Stop treatment, refer patient for evaluation

Note : In all cases of jaundice, anti-tuberculosis drugs should be stopped immediately and the patient refer for evaluation.

examined in a designated microscopy centre
 • Using sputum microscopy as

Table 4 — Showing Adverse Reaction if Any and Rhythm of Treatment

Adverse reaction	Rhythm of treatment -	
	Daily	Intermittent
Arthralgia	24 - 45%	3 - 8%
Hepatotoxicity	4 - 8%	0 - 1%
Gastro-intestinal, giddiness and others	9 - 27%	1 - 6%