

## A multicentre study of doctors' approaches to the diagnosis and treatment of tuberculosis in Turkey

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### Abstract

**Background:** Inappropriate anti-tuberculosis (TB) treatment, particularly at the beginning of the disease, is a major cause of drug resistance. This survey was performed to evaluate doctors' approaches to the diagnosis and treatment of TB.

**Method:** The study was conducted in 12 cities, each from a different geographical region of Turkey. A prepared questionnaire about their academic careers and experience in TB and its treatment was distributed to the doctors.

**Results:** The research group consisted of 1,112 doctors. The mean age was  $32.7 \pm 6.6$  years. The results showed that 75.9% of the doctors had insufficient knowledge about TB. The results of the study further showed that chest specialists, female doctors, physicians who work in a first stage hospital, doctors who had previously diagnosed TB and those who had access to a microbiology laboratory had a better level of knowledge about tuberculosis and its treatment than other doctors.

**Conclusion:** A great diversity was seen between daily practice of doctors and national guidelines about TB. Educational programmes conducted by specialists in TB control may help to standardize and increase the knowledge of TB.

**Key words:** tuberculosis, doctors, knowledge, diagnosis, treatment

*J Infect Dev Ctries* 2009; 3(5):357-364.

Received 19 August 2008 - Accepted 23 March 2009

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### Introduction

The World Health Organization (WHO) reported that 21,752 new tuberculosis (TB) cases were diagnosed in 2006 in Turkey. The incidence of TB was 29 out of 100,000. Of new patients 9132 were smear positive<sup>1</sup>. Turkey is among the countries with an intermediate disease burden.

Inappropriate and inadequate TB treatment may lead to treatment failure and acquired drug resistance, resulting in the preservation of the resistant microorganisms [2]. The main reason for resistance development is thought to be incorrect or inadequate treatment of patients by doctors [3]. The knowledge level of doctors about TB and their attitudes may influence national TB control programmes [4]. Delay in the diagnosis of TB may be prevented by early examination with the required tests to TB. Rapid chest radiography and sputum control in symptomatic patients have been suggested to prevent this delay

[5]. Moreover, it is known that there is a direct relationship between the inappropriate procedures at the beginning of anti-TB treatment and the specialization degree of the doctor [6,7]. In Turkey, patients are free to go to any medical center. TB patients are managed and treated in first, second, and third stage hospitals which are dispensaries, medical houses, state hospitals, private hospitals and university hospitals. In Turkey, treatment of 60-75% of TB patients begins in hospitals [8].

All TB patients who are diagnosed in any other medical center must attend to the dispensary and their family screening must be done. Patients can continue treatment without payment in the dispensaries. DOTS (directly observed treatment strategy) is done in the dispensaries. In Turkey the number of dispensaries is 252 and there are 21 specific TB laboratories. The most recent Turkish national guidelines related to TB

diagnosis, follow-up, and treatment were reported in 2007.

This study aimed to evaluate the knowledge of doctors about the diagnosis and treatment of TB in Turkey.

WHO concerning TB treatment and categorization. Doctors were asked about their specialization field (practitioner, specialist in chest disease, or other specialist), length of career (0-10 years or  $\geq 11$  years), type of institution and prior

**Table 1.** Number of doctors enrolled in the survey.

City	The number of doctors working in the city	The number of doctors enrolled in the survey	%
Rize	296	73	24.66
Mardin	276	64	23.19
Siirt	139	30	21.58
Kars	169	33	19.53
Kahramanmaras	748	145	19.39
Osmaniye	393	69	17.56
Diyarbakir	1130	172	15.22
Erzurum	1094	142	12.98
Kutahya	457	52	11.38
Afyon	550	57	10.36
Trabzon	1155	102	8.83
Konya	2014	173	8.59
Total	8421	1112	13.21

## Methods

The research was performed in 12 cities from different geographical regions of Turkey during the period of January to May 2007. At least 50 doctors were included to the study group from each city (Table 1). According to estimates in 2005, the population in these cities was 10,556,000, which is 14.7% of the country's population [9]. Mean TB incidence in these cities was 19.0 per 100,000 population, which was lower than that of the whole country [10]. A total of 104,226 doctors (53,344 specialists and 50,882 practitioner) worked in Turkey in 2004 [9]. Of these, 8,421 worked in the selected cities in 2004 [8], and 13.21% of them joined the survey (Table 1). The demographic features of the doctors are shown in Table 2. The study consisted of 477 practitioners and 635 specialists who constituted 1% of the total doctor population in the country. Oral consents were taken from the participants who were also informed of the study. No approval was needed from the ethics committee since the study was a survey study. The questionnaire was done face-to-face with the doctors and no source of information was available during the questioning.

The questionnaire composed of 17 questions regarding the knowledge and approach to TB according to the national Turkish TB guidelines, which are parallel and similar to the guidelines of the

experience with TB. Doctors were visited for the survey, and those who agreed to join the survey were included into the study. The number of doctors enrolled ranged between 33 and 173 in each city (Table 1).

A scale was formed out of eight questions relating to the knowledge level of TB. Every correct answer scored one point and each wrong answer scored 0. Scores of 4 or less were assumed as inadequate and scores over 4 accepted as an adequate level of knowledge (Table 3).

**Table 2.** Demographic features of doctors.

Feature	n	%
<b>Gender</b>		
Male	758	68.2
Female	354	31.8
<b>Institution</b>		
1 <sup>st</sup> Stage	378	34.0
2 <sup>nd</sup> Stage	388	34.9
3 <sup>rd</sup> Stage	346	31.1
<b>Carrier</b>		
>11 years	324	29.1
0-10 years	788	70.9
<b>Branch</b>		
Practitioner	477	42.9
Other Specialist	573	51.5
Chest Specialist	62	5.6

**Table 3.** Answers from doctors.

Questions	n	%
<b>First priority in diagnosis of pulmonary TB</b>		
Radiology	305	27.4
Clinic Symptoms	314	28.2
<b>Bacteriology (Correct)</b>	<b>320</b>	<b>28.8</b>
Tuberculin Skin Test	173	15.6
<b>Numbers of drugs for treatment of pulmonary TB</b>		
1-2	87	7.9
3	395	35.5
<b>4 (Correct)</b>	<b>611</b>	<b>54.9</b>
5	19	1.7
<b>Combination therapy for pulmonary TB</b>		
H+R	95	8.5
H+R+E	316	28.4
H+R+E+S	281	25.3
<b>H+R+E+P(Correct)</b>	<b>401</b>	<b>36.1</b>
H+R+E+P+S	19	1.7
<b>Combination for Relapsing TB</b>		
H+R+S	70	6.3
H+R+E+S	177	15.9
H+R+E+P	243	21.9
<b>H+R+E+P+S (Correct)</b>	<b>569</b>	<b>51.2</b>
Minor Drug Combination	53	4.8
<b>Period of treatment of pulmonary TB</b>		
<b>6 months (Correct)</b>	<b>372</b>	<b>33.5</b>
8 months	35	3.1
9 months	511	46.0
12 months	194	17.4
<b>Symptom thought first for pulmonary TB?</b>		
Night sweating	529	47.7
<b>Cough (Correct)</b>	<b>246</b>	<b>22.2</b>
Weight Loss	147	13.3
Sputum	122	11.0
Fever	58	5.2
Loss of appetite	7	0.6
<b>Strategy for TB suspicious patients negative for bacteriology</b>		
Sending to a center having certain diagnose facility (correct)	<b>849</b>	<b>77.0</b>
Sending to the dispensary	156	14.1
I treat it myself	81	7.3
I have no idea	17	1.5
<b>Intermittent regime is as effective as daily standard treatment, or not?</b>		
No	821	74.0
<b>Yes (Correct)</b>	<b>289</b>	<b>26.0</b>

## Statistical Analysis

Data were evaluated by using SPSS v10.0 (SPSS Inc, Chicago, IL, USA). They were also analyzed by Chi square test. Logistic regression analysis was used to determine the factors affecting TB knowledge level. Crude and adjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated. Adequate and inadequate knowledge levels were defined by a model. Data were analyzed by the Enter model, and  $P < 0.05$  was considered as statistically significant.

## Results

The mean age of all 1,112 doctors (354 women, 758 men) was  $32.7 \pm 6.6$  years. Of these, 545 doctors (49.0%) had diagnosed TB previously. Radiology and bacteriology departments were present at 73.1% and 54.9% of hospitals, respectively. The results of the survey showed that 75.9% of the doctors had insufficient knowledge about TB.

Thirteen (1.2%) doctors answered all eight questions in Table 3 correctly. The primary method for diagnosis of pulmonary TB for was accepted as bacteriology and the ratio of correct answers was 28.8%. The correct answer for the number of drugs chosen for TB was four, and 54.9% of the respondents answered correctly. HREP [1], was the correct answer for the combination therapy regimen used for newly diagnosed pulmonary TB, and 36.1% of the respondents answered correctly. The accepted combination therapy used to treat relapse pulmonary TB cases is HREPS, and 51.2% of the respondents answered correctly. Six months is the accepted period of treatment for pulmonary TB, and approximately one third (33.5%) of the doctors answered correctly. Cough is accepted as the first symptom for pulmonary TB, and 22.2% of the respondents answered correctly. Seventy-seven percent of the doctors recognized that sending a patient to a center with specialized diagnostic capabilities as the correct strategy for treating suspicious patients negative for bacteriology. The ratio of doctors who answered that intermittent regime was as effective as a daily standard regime was 26.0%. The doctors' answers are summarized in Table 3.

The results of the study showed that that female doctors, physicians who working in a first stage hospital, chest specialists, doctors who have access to a bacteriology facility, and those who had previously diagnosed TB had the highest scores (Table 4). Logistic regression analyses revealed the following data: female doctors had 1.7 times higher knowledge level (C.I.=1.3-2.3) than males; chest specialists had

19.0 times (95% C.I. = 6.8-53.0) higher knowledge level than other practitioners; doctors who work in first stage hospital had a knowledge level 2.4 times higher than the second stage workers (95% C.I.=1.4-4.3); those who had diagnosed TB previously had knowledge levels 1.9 times higher than their colleagues (95% C.I. = 1.4- 2.5); and those who had access to a basic bacteriology facility had knowledge levels 1.5 times higher (95% C.I. = 1.0- 2.2). The results are shown in Table 4. The length of time a doctor had been working (O.R = 1.2, 95% C.I. = 0.9- 1.7) and access to a basic radiology facility (95% C.I = 0.7- 1.9) did not show any significance ( $p > 0.05$ ).

## Discussion

In the absence of other complications and with appropriate and adequate treatment, TB is a curable disease. Treatment difficulties may be encountered if treatment is delayed or resistance develops due to inappropriate suggestions and treatment combinations started by doctors (for example, unnecessary addition or withdrawal of the drugs, wrong approach to TB patients, etc). As suggested by various guidelines, adequate and appropriate treatment is essential to prevent the spread of TB and drug resistance [11,12].

The requirement of microbiological examination to diagnose TB was mentioned by 75% of doctors in a study done in 2003 in Turkey [13]. Another study showed that 75.8% of general practitioners accepted a positive sputum test as enough criteria to diagnose TB [14]. However, these two mentioned studies were performed in only one city of Turkey, and the results do not reflect the thoughts of all doctors throughout the country.

Sputum examination was defined as the main diagnostic test by 38% of Pakistani doctors and by 12% of Indian doctors [15,16]; however, Auer *et al.* [17] reported that only 13% of the doctors used sputum examination routinely. It is known that microbiological examination is essential for certain diagnosis of pulmonary TB. The higher knowledge level of doctors working in hospitals where a bacteriology department is available indicates the fact that the presence of bacteriology department affects the doctors' approach positively about TB diagnosis and treatment.

A study done in Turkey has documented that 30.8% of the doctors initiated the treatment of a new TB case with four drugs [13]. Another study done in the Aegean region of Turkey found this level to be 53% [18]. Moreover, two other international studies

have determined this level to be 60% [16] and 39% [15], which is similar to our results. Since drug resistance is high and Isoniazid (I) resistance is higher than 4% in Turkey [12,19], new TB treatment should be started with four drugs. Drug combinations composing fewer than four drugs may lead to drug failure and drug resistance in the treatment.

tendency to ignore the guidelines about diagnosis and treatment of TB [17]. Another study has also found that most of the treatment regimes among the 80 available are inadequate and expensive [23]. Likewise, we also reported similar results about the approach to the diagnosis of TB and treatment.

**Table 4.** TB knowledge levels of Doctors

	Number	Adequate (%)	Crude Odds Ratio (95 Confidence Interval)	Adjusted Odds Ratio (95 Confidence Interval)
<b>Gender</b>				
Male	758	33.8	1	1
Female	354	48.3	1.8 (1.4-2.4) (p< 0.001)	1.7 (1.3-2.3) (p< 0.001)
<b>Branch</b>				
Practitioner	477	34.2	1	1
Other Specialist	573	36.0	1.1(0.8-1.4)	1.4 (0.8-2.2)
Chest Specialist	62	91.9	21.9 (8.2-63.3) (p< 0.001)	19.0(6.8-53.0)(p< 0.001)
<b>Institution</b>				
1 <sup>st</sup> Stage	378	38.1	1.2 (0.9-1.7)	2.4 (1.4-4.3) (p< 0.01)
2 <sup>nd</sup> Stage	388	33.4	1	1
3 <sup>rd</sup> Stage	346	44.3	1.6 (1.2-2.2) (p< 0.01)	1.2 (0.8- 1.7)
<b>Previously Diagnosed TB</b>				
No	567	30.2	1	1
Yes	545	47.0	2.0 (1.6-2.6) (p< 0.001)	1.9 (1.4-2.5) (p< 0.01)
<b>Bacteriology Facility</b>				
No	500	32.6	1	1
Yes	607	43.2	1.6 (1.2-2.0) (p< 0.01)	1.5 (1.0-2.2) (p< 0.05)
<b>Basic Radiology</b>				
No	299	34.8	1	1
Yes	808	39.7	1.2 (0.9-1.6)	1.1 (0.7-1.9)
<b>Carrier</b>				
≥ 11 years	323	31.5	1	1
0-10 years	784	37.5	1.1 (0.9-1.5)	1.2 (0.9- 1.7)

The WHO suggests a short period treatment for new TB cases as follows: Isoniazid (H) + Rifampicin (R) + Pyrazinamide (P) + Ethambutol (E) or Streptomycin (S) as an initial phase for two months, then H+R as a continuous phase for four months [20]. It also suggests a treatment regime of H+R+P+S+E for two months, followed by H+R+P+E for one month, and then H+R+E for five months for the relapse TB cases. The WHO explains in its guidelines that H, R, P, and E may be as effective as daily doses if given three times weekly but thioacetazone is not [20.] Research done in Pakistan has shown that doctors do not adequately follow WHO TB treatment guidelines [21]. Similar outcomes were found in Bolivia [22]. Doctors have a

It is very obvious that different treatment regimes from the present guidelines and incomplete drug usage with different doses and duration mostly result in treatment failure.

Appropriate drug combination for newly diagnosed TB has been suggested by 19% of the doctors [13]. Another study has documented this level to be 60% [16]. Only 9.7% of the doctors knew the appropriate drug combination mentioned in the present guidelines [24]. Roughly two-thirds of the doctors in Pakistan were unaware of the appropriate treatment regimes [25]. This level was 7.5% in Somalia [26]. We found that this rate was also low in Turkey. Since specialists other than chest physicians were unaware of the current information in WHO guidelines of, we believe that education programs

must be instituted to improve the treatment of TB. The results obtained in our study indicate that TB treatment should be performed by specialists in particular institutions. Similar suggestions were also made in other studies [7,8].

Two different studies conducted in Turkey found that 34%, 6% and 48.5% of the doctors accepted six months as an adequate period to treat TB [13,14]. In the Philippines, this ratio was 33% of doctors [17]. Our data related to this treatment period were similarly low. In another study from Pakistan only 3% of the doctors answered questions correctly [25]. We suggest that a better understanding of TB needs to be conveyed to doctors.

Our study has indicated that TB knowledge level was indirectly proportional to time passed from graduation. The personal experiences of doctors may influence the choice of treatment modalities. Khan *et al.* found that the patients of doctors experienced in TB treatment were more likely to be given directly observed treatment, and the death rates among them were lower [27]. TB knowledge levels of the practitioners working in the first stage health institutions were inadequate. Similar results were obtained in a study done in India [16]. It was noticed that education campaigns increased the adjustment of doctors to the TB control programs [28].

Training programs must focus on doctors who are inexperienced in treating TB and those who work at primary and secondary health care centers, as well as practitioners and specialists in areas other than chest disease. The main conclusion of our research is that Turkish doctors must be educated to increase the level of knowledge about TB and its treatment.

## References

1. Global tuberculosis control: surveillance, planning, financing (2008) WHO report. Geneva, World Health Organization.
2. Bass JB Jr, Farer LS, Hopewell PC, Jacobs RF, Ruben F, Snider DE Jr, Thornton G (1994) Treatment of tuberculosis and tuberculosis infection in adults and children: American Thoracic Society and the Centers for Disease Control and Prevention. *Am J Respir Crit Care Med* 149: 1359–1374.
3. Mahmoudi A, Iseman MD (1993) Pitfalls in the care of patients with tuberculosis: common errors and their association with the acquisition of drug resistance. *JAMA* 270: 65-68.
4. Tubeküloz epidemiyolojisi ve kontrolü. *Infeksiyon hastalıkları serisi*. (In Turkish) 4: 5-13.
5. Sasaki Y, Yamagishi F, Yagi T, Yamatani H, Kuroda F, Shoda H (2000) A study of patient's and doctor's delay in patients with pulmonary tuberculosis discovered by visiting doctors with symptoms in particular on doctor's delay. *Kekkaku* 75: 527-532.
6. Rao SN, Mookerjee AL, Obasanjo OO, Chaisson RE (2000) Errors in the treatment of tuberculosis in Baltimore. *Chest* 117: 734-737.
7. Liu Z, Shilkret KL, Finelli L (1998) Initial drug regimens for the treatment of tuberculosis: evaluation of physician prescribing practices in New Jersey, 1994 to 1995. *Chest* 113: 1446-1551.
8. Ozkara S, Kilicaslan Z, Ozturk F, Seymenoglu S, Erdogan AR, Tellioglu C, Kosan AA, Kaya B, Kocoglu F, Kibaroglu E (2002) Bölge verileriyle Türkiye de tuberküloz. (Turkish) *Toraks dergisi* 3: 178-187.
9. Turkish statistical institute (2008) Available: <http://www.tuik.gov.tr>. Accessed 11 August 2008.
10. The ministry of health of Turkey (2008). Available: <http://www.saglik.gov.tr/VSDDB> Accessed 11 August 2008.
11. Centers for Disease Control and Prevention (1993) Initial therapy for tuberculosis in the era of multidrug resistance: recommendations of the Advisory Council for the Elimination of Tuberculosis. *MMWR* 42: 1–8.
12. Gok M, Yasar S (1997) Multidrug Resistance Tuberculosis. *Turkiye Klinikleri* 17:82-84
13. Cirit M, Orman A, Unlu M (2003). Physicians' approach to the diagnosis and treatment of tuberculosis in Afyon, Turkey. *Int J Tuberc Lung Dis* 7: 243-247.
14. Deveci SE, Turgut T, Acik Y, Deveci F, Muz MH (2003) The Knowledge, attitude and behavior related to the tuberculosis and approaches of tuberculosis therapy by the physicians providing first step service. *Tuberk Toraks (In Turkish)* 51: 40-47.
15. Rizvi N, Hussain M (2001) Survey of Knowledge about tuberculosis among family physicians. *J Pak Med Assoc* 51: 333–337.
16. Singla N, Sharma PP, Singla R, Jain RC (1998) Survey of knowledge, attitudes and practices for tuberculosis among general practitioners in Delhi, India. *Int J Tuberc Lung Dis* 2: 384-389.
17. Auer C, Lagahid JY, Tanner M, Weiss MG (2006) Diagnosis and management of tuberculosis by private practitioners in Manila, Philippines. *Health Policy* 77: 172-181.
18. Ucan ES, Altinisik G, Akpınar O, Kilinc M (1996) The approaches of physicians to tuberculosis war in Aegean Region, Turkey. *Solunum* 20: 77-90.
19. Yildiz F, Becerik F, Ozkarakus O (1996) Bacteriologic diagnosis and drug resistance results of Kocaeli Central Tuberculosis Dispensary in 1994. *Marmaris: XXIIth National Tuberculosis and Chest Disease Congress*. (In Turkish) Congress book pp; 27.
20. World Health Organization (2003) Treatment of tuberculosis. Guidelines for national programmes. Geneva: WHO.
21. Arif K, Ali S A, Amanullah S, Siddiqui I, Khan JA, Nayani P (1998) Physician compliance with national tuberculosis treatment guidelines: a university hospital study. *Int J Tuberc Lung Dis* 2: 225-230.
22. Olle-Goig JE, Cullity JE, Vargas R (1999) A survey of prescribing patterns for tuberculosis treatment among doctors in a Bolivian city. *Int J Tuberc Lung Dis* 3: 74-78.
23. Uplekar MW, Shepard DS (1991) Treatment of tuberculosis by private general practitioners in India. *Tubercle* 72: 284-90.

24. Shimeles E, Aseffa A, Yamuah L, Tilahun H, Engers H (2006) Knowledge and practice of private practitioners in TB control in Addis Ababa. *Int J Tuberc Lung Dis* 10: 1172-1177.
25. Shehzadi R, Irfan M, Zohra T, Khan JA, Hussain SF (2005) Knowledge regarding management of tuberculosis among general practitioners in northern areas of Pakistan. *J Pak Med Assoc* 55: 174-176.
26. Suleiman BA, Houssein AI, Mehta F, Hinderaker SG (2003) Do doctors in North-western Somalia follow the national guidelines for tuberculosis management? *East Mediterr Health J* 9: 789-795.
27. Khan K, Campbell A, Wallington T, Gardam M (2006) The impact of physician training and experience on the survival of patients with active tuberculosis. *CMAJ* 175: 749-753.
28. Caminero JA, Billo NE (2003) Involving private practitioners and chest physicians in the control of tuberculosis. *Tuberculosis (Edinb)* 83: 148-155.

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**Supplement 1: Survey on approach to TB diagnose and treatment****1-Age** **2-Gender:** ( ) Male ( ) Female**3-Branch:**

- a-) Practitioner
- b-) Pulmonologist/Assistant
- c-) Pediatrics/Assistant
- d-) Internal diseases specialist/assistant doctor
- e-) Other Branch Specialist
- f-) Surgery Specialist

**4-Institution:**

- a-) 1<sup>st</sup> Stage (Primary medical station, Health House, and Dispensary)
- c-) 2<sup>nd</sup> Stage (State Hospital, Private Hospital)
- d-) 3<sup>rd</sup> Stage (University Hospital)

**5-Carrier**

- a-) 0-5 years
- b-) 6-10 years
- c-) 10-15 years
- d-) ≥15 years

**6- Previously TB Diagnose?**

- a-) Yes
- b-) No

**7- Which symptom is thought first for pulmonary TB?**

- a-) Cough
- b-) Sputum
- c-) Night Sweat
- d-) Heat
- e-) No appetite
- f-) Weight Loss

**8- Essential diagnose method to be applied for pulmonary TB?**

- a-) Radiology
- b-) Clinic Symptoms
- c-) Bacteriology
- d-) Tuberculin Skin Test (TST)

**9- Presence of Radiology in the Institution?**

- a-) Yes
- b-) No

**10- Presence of Bacteriology in the Institution?**

- a-) Yes
- b-) No

**11- Number of drugs for new pulmonary TB diagnosed patients?**

- a-) 1
- b-) 2
- d-) 3
- e-) 4
- f-) 5

**12- Which strategy is used for TB suspicious patients who are negative for bacteriology?**

- a-) I send to dispensary to begin treatment
- b-) I begin treatment
- c-) I send a center which has certain diagnose facility
- d-) I have no idea

**13- Which drug combination is used for the new pulmonary TB diagnosed patients?**

- a-) H + R
- b-) H + R + E
- c-) H + R + E + S
- d-) H + R + E + P
- e-) H + R + E + P + S

**14 - Which treatment regime is suitable for relapsing TB cases?**

- a-) H + R + E
- b-) H + R + E + S
- c-) H + R + E + P
- d-) H + R + E + P + S
- e-) Minor drug combination

**15- Do you think if 2-3 days treatment regime in a week is as effective as daily standard treatment, or not?**

- a-) Yes
- b-) No
- c-) I have no idea

**16- How many months does a normal pulmonary TB treatment last?**

- a-) 5
- b-) 6
- c-) 8
- d-) 9
- e-) 12