Improving Patient Adherence to Tuberculosis Treatment

Revised 1994

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Center for Prevention Services
Division of Tuberculosis Elimination
Atlanta, Georgia

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Introduction

Tuberculosis (TB), a contagious disease that frequently affects the lungs, has returned as a public health threat in the United States. From 1985 (the year with the lowest number of TB cases since national reporting began in 1953) through 1993, reported cases of TB increased 14% (1).

TB is nearly always curable if patients are given a complete and uninterrupted course of drug therapy and if they take these medications as prescribed. However, poor adherence to TB medication regimens is a common problem and leads to inadequate treatment. The consequences of inadequate and incomplete TB treatment are serious (2, 3, 4):

- prolonged illness and disability for the patient
- infectiousness of the patient, causing continued transmission of TB in the community
- development of drug-resistant TB
- the possibility of death

This booklet describes strategies and perspectives for improving patient adherence to TB treatment. These strategies are geared toward the concept of providing individualized services that are sensitive to the health, social, cultural, and economic needs of persons with TB. The booklet covers the following topics:

- basic assumptions underlying the care of persons with TB
- getting to know your patient
- predicting and assessing adherence
- strategies for improving adherence
- problem solving
- adherence by children and adolescents
- legal remedies for ensuring adherence

This information is intended for health care workers who provide TB prevention and treatment services in a variety of settings.

Basic Assumptions

The approach and suggestions presented in this booklet reflect several important assumptions.

Persons with active TB can be successfully treated with currently recommended primary drug regimens.

1. Persons with active TB can be successfully treated with currently recommended primary drug regimens provided the patients are fully adherent to the prescribed regimen.

2. Although the tools are available, the successful treatment of TB cannot be achieved by clinical medicine alone. Treatment success is influenced by the health care system and by the behaviors both of patients and health care providers. Treatment outcomes may be influenced by many factors:

    - personal and social characteristics of patients and health care providers
    - culturally determined knowledge and beliefs of patients and providers
    - health care infrastructure that supports TB treatment
    - quantity and quality of information about TB that is available to patients and the public
    - extent of patient's knowledge of TB
    - quality of training that health care providers have received

The successful treatment of TB cannot be achieved by clinical medicine alone.

Other factors — economic, legislative, and political — can also have an effect, although indirectly, on treatment outcomes. Together and individually, all of these factors influence the behavior of patients and health care providers.

You, the provider, must do everything possible to educate, support, influence, and persuade the patient to take the medications as prescribed and to complete treatment.

3. Patients and health care providers share responsibility for treatment outcomes. Even though patients must decide daily whether to take medications, their success in adhering to treatment is strongly influenced by the acceptability and accessibility of the care they receive. For this reason, providers have a much greater responsibility than making appropriate drugs

available. Treatment success will depend on the development of a partnership — an alliance between the patient and the provider.

4. All patients are different, and treatment should be individualized to meet their specific concerns and constraints. Individualizing the treatment will require some understanding of each patient's social and cultural values.

5. TB is a complex disease that carries biological, social, and cultural ramifications for the patient. Health care providers should be mindful of the strong impact that this disease can have on all aspects of the patient's life and try to help the patient cope with the resulting difficulties.

Adherence is the preferred term.

The basic premise of this booklet, then, is that providers have an important responsibility for reaching out to patients, who will make many important decisions about how well they follow treatment recommendations. For this reason, the word **compliance**, which suggests a more passive role for the patient, is not used. **Adherence** is the preferred term because it suggests a partnership between the patient and provider, and a sharing of responsibility for treatment outcomes (5).

Getting to Know Your Patient

Obtaining Patient Information

For you to provide care that addresses the specific needs of your patients, it is important that you learn as much as possible about your patients' health history, beliefs and attitudes about TB, sources of social support, and potential barriers to treatment adherence. This information may come from a variety of sources. Frequently, patients with TB come to medical attention when they seek care for symptoms that are affecting their daily activities. Some of these symptoms are strongly suggestive of TB; others may suggest other health problems. Those of you who work in TB programs may first become aware of patients with active TB through referrals from other health care providers, such as physicians in private practice and staff of hospitals, correctional facilities, homeless shelters, nursing homes, as well as other public health clinics.

Learn as much as possible about your patient's health history, beliefs and attitudes about TB, sources of social support, and barriers to treatment.

The amount and type of information communicated to TB program staff differ, depending on the referring agency. For example, if the diagnosis is made while the patient is in the hospital, the staff nurse, the discharge planner, or the infection control nurse usually makes a telephone referral to the TB program. A summary of the patient's health and social history should be given to the program staff.

Although the information obtained from the hospital staff is important baseline information, TB program staff usually complete an additional assessment. This assessment should include information about the patient's

- health and social history
- close contacts
- barriers to adherence and follow-up care

Ideally, program staff should visit the patient to begin the assessment before the patient is discharged from the hospital. If this is not possible, the assessment can be started with the first patient encounter. If the patient is not hospitalized, a home visit should be made as soon as possible after notification. The information you obtain during these visits is confidential. Follow your agency's guidelines for maintaining the confidentiality of patient information.

To exchange information during the assessment, you and the patient must be able to communicate with each other. If you and the patient do not speak the same language, communication becomes particularly challenging.

Working with an Interpreter

Serious communication problems can occur when you and the patient do not speak the same language. Those of you who have access to interpreters may believe that the interpreter will solve your communication problems. You may not be aware that using an interpreter to translate health information can facilitate as well as hinder effective communications between you and your patients. The following are examples of problems you may experience when working with interpreters.

1. Interpreters sometimes interject their own interpretation of what has been said. This practice can result in the interpreter's communicating incorrect information.

2. Interpreters may fail to convey the shades of meanings in what you and your patient are saying; this may result in misunderstandings.

3. Using an interpreter introduces a third person into the relationship; patients may be reluctant to discuss sensitive information in the third person's presence.

4. The interpreter may be from the patient's community and have access to information about the patientthat is not available to you. This may create a conflict between the interpreter and the patient if the patient withholds information you need, and the interpreter is aware of your need to know. Remember, your patient has to return to the community. Be mindful of the problems your patient may encounter if the interpreter does not keep the patient's health information confidential.

5. There may not be linguistic equivalents that convey all of the concepts you and the patient are communicating. At best, the interpreter maybe able to provide only an approximation of the messages.

To avoid some of these problems, use the services of trained medical interpreters. However, trained interpreters are not always available. Typically, the persons who function as interpreters are the patients' family members, volunteers from the community, or other staff of health care facilities who speak the patient's language. Family members and some volunteers from the community do not function well in this role because they are usually unfamiliar with medical terms. Both groups will be exposed to information about the patient that is personal and confidential, and there will be no way for you to ensure that the information is kept confidential.

If you must use family members as interpreters, avoid using children. Children in this role are apt to be exposed to sensitive information or be asked to convey information that the family considers inappropriate. Young children may become distressed. They also have less ability to understand and communicate detailed information.

After you have selected the appropriateperson to interpret for you, follow these guidelines to improve the translations:

1. Plan the interview and decide what information you want to discuss with your patient.

2. Meet with the interpreter before the interview to discuss the interview goals and to review the ground rules.

3. Instruct the interpreter to use the patient's own words.

4. Ask the interpreter to clarify questions or responses if they are not clear.

5. Keep the message simple and concrete.

6. Present one point at a time.

7. Present the message in short phrases.

8. Allow the interpreter to translate each phrase before you continue.

Maintain eye contact with the patient during the interview, if this is culturally appropriate. Observing your patient's

Assess Nonverbal Cues
- eye contact
- facial expressions
- body position

behavior when making eye contact may suggest whether or not the patient is comfortable with this behavior. For example, the patient who is not comfortable with direct eye contact may break off the contact and look away. Observing your patient's nonverbal behavior (such as facial expressions and body positioning) may give you clues about the patient's feelings. Ask the patient about any emotional reactions you have observed. This is important because the emotions behind statements can alter the meaning of the statements. After the interview has ended, meet with the interpreter once more and ask for comments on the patient's word content and emotions.

If you know a few words of the patient's language, use them. It may make the patient feel more comfortable by conveying your caring and interest. If you work in an area with a large number of patients who do not speak English, you might consider learning their language. At a minimum, you could learn some greetings and key words and phrases associated with TB services.

Remember, you must be able to establish effective communication with your patients — with or without an interpreter — to assess their health needs. This information will help you develop interventions that are specific to the needs of your patients (6 –10).

Assessing Health Needs

TB program physicians or nurses are responsible for the initial assessment of patients' health needs. Other program personnel may also contribute their observations. The contents of the assessment may include the following categories:

- medical history
- history of previous TB infection or disease
- TB risk factors, including HIV status
- family history of health problems
- social and occupation information
- physical examination findings

- Mantoux tuberculin skin test results
- chest x-ray results
- bacteriologic examination results
- names and number of contacts
- patient's perceptions about TB
- barriers to adherence
- health education needs
- resources to facilitate treatment completion

Assessing Patients' Perceptions about TB

A complete evaluation of the patient's health needs should include an assessment of the patient's perceptions about TB. This is important because it will identify similarities in, as well as differences between, your patient's and your perceptions about TB and its treatment. The patient's perceptions about TB (what causes TB, what TB does to the body, how severe it is, signs of TB, why it occurs when it does, personal and social problems caused by TB, and how it is treated) may be different from your understanding of the disease process and the treatment of it. Because these differences increase the likelihood of misunderstanding and thus of nonadherence, it is important to identify these differences early in treatment.

One technique for identifying differences in patients' and health care providers' understanding of TB is to ask a series of exploratory questions. The following questions have been used in a variety of clinical situations (11,12). They may help you understand how your patients view their illness.

1. What do you think causes TB?
2. What problems will your illness cause you?
3. Why do you think you got sick when you did?
4. What does TB do to your body?
5. How severe do you feel your illness is?

6. What treatment do you think you should receive for TB?

7. What are the most important results you hope to receive from this treatment?

8. What are the main problems your illness has caused for you?

Understanding your patient's perspective is an important step toward ensuring adherence.

9. What do you fear about your illness?

10. How do your family members or close friends feel about your TB?

These questions can be incorporated into an existing health assessment or an ongoing assessment of patients' educational needs and treatment adherence. The questions may be reworded in accordance with your patients' cultural, linguistic, and educational backgrounds. The number and sequence of the questions may be changed to meet the needs of your specific situation.

However, the most important point to remember about assessing your patients' perceptions about TB is to first create an atmosphere of trust and acceptance so that your patients will feel comfortable discussing their thoughts with you.

1. Discuss openly and honestly any obvious differences in patient-provider perceptions.

2. Correct patient misinformation.

3. Support discussions with objective information, such as chest radiographs or laboratory reports.

Remember, when patients' perceptions are different from your own, you should acknowledge these differences. Accept that the patient has a different point of view and then make sure the patient understands your point of view about TB. You can make it clear that although you do not share your patients' views, you respect them. Understanding your patients' perspective is an important step toward establishing a trusting relationship, which increases the likelihood of adherence.

Predicting Patient Adherence

Always be aware that any patient can be nonadherent. Although many health care providers believe that they can predict whether a particular patient will take medication as prescribed, research data indicate that providers on the average are correct only about 50% of the time (5,13).

Know the patient's history**.** Once you know more about your patient, you can predict adherence more accurately. One of the strongest predictors is a patient's history of adherence. Try to determine whether the patient has had difficulty maintaining adherence with TB medications or with other regimens. Although poor adherence is not a personality trait, a history of adherence problems, particularly with TB medications, will help you anticipate a problem.

Know the patient's history.

Ask the patient. Sometimes a patient may have strong reasons for not wanting to take medications. Ask your patient about his or her knowledge and beliefs concerning the causes and treatment of TB. Asking about your patient's beliefs is an important way of identifying signals for nonadherence.

Ask the patient.

A CDC study concluded that there are many reasons why a person might not want to take TB medications. For example,

- Immigrants and refugees may fear that having TB disease or infection will make them subject to legal action, such as deportation, so they may give the appearance of being adherent by picking up refills (although they may not take the medicines).
- Many foreign-born persons have histories of BCG inoculation and believe that they cannot develop TB.
- Persons vulnerable to TB may have other life demands that are of higher priority to them than preventing or curing TB.
- Many people think of public health as part of the "system" that they have come to mistrust; some may believe that public health interventions will actually cause disease or attempt to hurt a group of people because of their race.
- Some patients who use alcohol or drugs fear the side effects that may result from their taking TB medications while taking other substances.

- Having TB carries a stigma for many people and may lead to shame, fear of social rejection, or fear of the loss of a job.

- Attending a treatment center for TB may mean taking time off work or other essential competing activities.

- Many patients are afraid that TB drugs will cause dangerous side effects and lead to illness or costly medical interventions.

- Some groups may not believe that health care providers can correctly diagnose or treat TB and that the drugs prescribed are ineffective or inappropriate for members of their racial or national group.

- Many groups have strong cultural beliefs about health and treatment for disease that may compete with the prescribed regimen for TB.

Clearly, people may have reasons, which are logical to them, for not taking medications. Identify these reasons and provide health education (see Assessing Patients' Perceptions about TB, p. 9).

Ask patients their concerns about TB.

Ask patients their concerns about TB. Patients who believe that their disease or infection is a serious problem are more likely to take TB medications. Ask patients which close friends or family members are concerned about their health and will help them remember to take medications. In general, it seems that adherent patients are those who believe that they have the support of family members and of the doctor or other providers. Find out if your patients understand what you have told them about TB; ask them to explain it in their own words. Adherent patients tend to understand the causes of TB and its treatment.

Look for early warning signs.

Look for early warning signs. It is important for you to monitor for adherence early during treatment in order to anticipate future problems. It is probably correct to say that "adherence predicts adherence," so the patient's own behavior may be the strongest cue to what the patient will do in the future. However, patients with active disease who are initially adherent will begin to feel well after a few weeks of treatment and may then forget their medication or believe that it is no longer needed. Therefore, even patients who have followed the

regimen early in treatment should be monitored and given assistance to ensure continuing adherence after symptoms have been relieved.

Avoid reliance on demographic information.

Avoid reliance on demographic information. Keep in mind that demographic factors (such as age, sex, race, ethnicity, occupation, income, and education) are inconsistent or unreliable predictors of adherence with TB medications. The real predictors of nonadherence may be poor access to health information or services.

Assessing for Adherence

Health care providers often do not know that a patient is not following recommendations. It is very important for you to determine whether your patients are taking medications as prescribed. Your first responsibility is to be aware of the general problem of nonadherence and to have a high index of suspicion. Consider several methods for assessing adherence.

Indirect Methods

Ask the patient.

Ask the patient. Talking with the patient can be an effective way to estimate adherence. It may be useful to simply ask your patient whether he or she will be able or willing to take medications for the prescribed time. Patients who admit that they may not be adherent are often likely to discuss barriers to adherence and ways of overcoming them. Do this periodically in a nonthreatening but direct manner. Address incorrect medicine taking so that patients aren't afraid to tell the truth. For example, you might try one of the following questions (14-17):

> People often have difficulty taking their pills for one reason or another. Have you had any difficulty taking your pills?
>
> Many patients find it difficult to take their medication as their doctors say they should. Over the past [insert period of time], do you think you have taken your medicine as you should, on schedule and regularly?
>
> In general how often do you take the pills? In the past [insert period of time], was there any time you missed taking your pills for more than one day?

Communicate effectively; use an information-intensive style.

Communicate effectively. It is best to use an information-intensive style in which you ask for very specific information and also give your patient the opportunity to show his or her knowledge. Using this style, you create open interaction between you and the patient (17). Here is an example of an adaptation of this style:

Health Care Worker (HCW): How many pills do you take a day?

Patient (P): Of what?

HCW: The isoniazid.

P: Yeah, the INH. One in the morning.

HCW: Okay, and what about the rifampin? The red pills?

P: I take the red pills two times a day.

HCW: You take one pill once a day, don't you?

P: No, one pill two times a day.

HCW: You need to take the red pills once a day.

P: Oh, I'd better check that because I've been taking them more often.

This style should reveal information about adherence and should also help to uncover problems in the patient's understanding of the regimen.

Help the patient remember.

Help the patient remember. People tend to forget and to underreport events relating to their health. Encourage the patient to discuss his or her experiences with adherence and what seems to cause problems. Ask for specific information:

- how often the patient takes medication
- the number of doses taken
- how the patient remembers to take the medication
- whether the patient has problems with the medications

Listen carefully.

Be sure to listen carefully and tell the patient that the information he or she tells you is very important. Ask the patient to agree to remember and report any problems with takingthe medications.

Monitor pills and appointments.

Monitor pills and appointments. Asking patients to bring their medicines for pill counts and monitoring appointment keeping, medication refill, and pickup are other ways of assessing for adherence. However, be aware that if patients wish to avoid appearing nonadherent, they may forget to bringtheir pill bottles, discard medications, attend clinic butstill fail to take their medications, or pick up medicines that they never use.

Check the patient's response to therapy.

Check the patient's response to therapy. Another indirect method of assessing adherence is to determine how well your patient is responding to therapy by asking yourself:

- Has the patient's sputum result improved or converted to negative?
- Does the chest film indicate improvement?
- Have the TB signs and symptoms improved or disappeared?

However, response to therapy cannot be used as the sole method of assessing adherence.

- Several weeks or months may elapse between the initiation of therapy and the discovery that sputum conversion has not occurred or that the chest radiograph does not show improvement. In the meantime, transmission of infection may continue, drug-resistant organisms may emerge, or serious complications may develop.
- Factors other than nonadherence, such as drug resistance, can lead to a poor therapeutic outcome.
- A patient who does not adhere to treatment may take enough drugs to become culture negative, but not enough to prevent treatment failure or relapse several weeks or months later.

Direct Methods

Test urine for metabolites.

Test urine for metabolites. One of the direct methods for assessing adherence is to detect the presence of TB drugs or their metabolites in a sample of the patient's urine. The limitation of these tests is that they show only recent ingestion

of medication (within the past 24 to 48 hours). They cannot be used to measure an ongoing pattern of adherence. In addition, they are influenced by the patient's rate of metabolizing the medication.

Commercial "dipsticks" can be used for detecting isoniazid (INH) metabolites in the urine. A test for the presence in the urine of rifampin (RIF) or its metabolites is examination of the color of the urine. In most patients, RIF turns urine, saliva, sweat, and tears an orange-red color. A quick glance at a urine specimen reveals whether the patient has recently taken this medication.

Directly observe the patient.

Directly observe the patient. Directly observing your patient swallow each dose of medication is an effective method of assessing for adherence (see Give Directly Observed Therapy, p. 19).

Strategies for Improving Adherence

Give Directly Observed Therapy

Directly observed or supervised therapy (DOT) is one method of ensuring patient adherence (18). DOT is defined as "observation of the patient by a health care provider orother responsible person as the patient ingests TBmedications" (19).

CDC and the American Thoracic Society recommend that DOT be considered for all patients because of the difficulty in predicting whether a patient will be adherent. Base decisions about the use of DOT in any particular treatment setting on a quantitative evaluation of local rates of treatment completion. If the percentage of patients who complete therapy within 12 months is <90% or unknown, initiate or expand the use of DOT.

In any situation, consider extending the use of DOT to improve the completion rate. All patients with TB caused by organisms resistant to either INH or RIF and all patients receiving intermittent therapy should receive DOT (18). Also, persons who are at high risk for nonadherence should receive DOT:

- persons who abuse substances
- persons with mental, emotional, or certain physical impairments that interfere with their ability to self-administer medications
- children and adolescents
- persons with a history of treatment nonadherence

To be effective, DOT must be part of a program of services. For example, the DOT program initiated in 1992 in New York City provides supervision in community settings convenient to patients, incentives and enablers to encourage patients to take medications and reduce barriers to adherence, assistance with housing for homeless patients, a system to track patients through hospital discharge planning, and a method of tracking inmates released from jail or prison (20).

A successful program in Tarrant County, Texas, included specially trained community-service aides; transportation of

patients to clinics; delivery of drugs to the patient's residence, workplace, or other convenient site; and intermittent regimens after an initial period of daily treatment.

The many examples of successful DOT programs typically incorporate a comprehensive array of services that include a team of health providers to provide continuity of care, case management, and follow-up; service settings that are convenient for patients; practices that are acceptable to patients; and additional social or health services.

A committee convened by the American Lung Association (ALA) gave the following broad definition of a DOT program: a DOT program is a comprehensive combination of patient-focused services in which the health care provider

1. observes the patient swallowing medicine
2. enables patients to keep appointments
3. offers incentives to encourage adherence
4. establishes efficient clinic systems for scheduling appointments, keeping records, and providing pharmacy services
5. provides careful case management and continuity of care through the use of a team of personnel whose members work together to assist each patient in completing treatment
6. provides patients with needed health or social services, or makes referrals to other appropriate service agencies
7. provides effective education to patients and key individuals in the patient's social environment
8. communicates effectively with patients whose cultural and linguistic backgrounds are different from the health care worker's (see Working with an Interpreter, p. 6).

Pozsik described strategies used in a DOT program established by the South Carolina TB control program. The following are her recommendations (21):

1. Staff must recognize DOT as their standard of care and convey this with confidence to patients.

2. The patient and provider must mutually agree on the location for DOT; the time and location need to be convenient and safe. If the patient cannot go to the treatment center, the staff must go wherever the patient can meet them. DOT must not interfere with the patient's work schedule. Sometimes staff at other health care settings, such as hospital emergency rooms, can be asked to help deliver DOT to a patient who has easy access to that location.

3. It is important to protect the patient's confidentiality. For example, the patient may prefer that you not let neighbors know why you are visiting.

4. Sometimes, the staff may designate another person to watch the patient take medications. Pozsik warned that it is not desirable to delegate this responsibility to the patient's family members. Because of the emotional ties some family members have with the patient, the family may be unwilling to ensure that the patient takes the medications when the patient resists treatment. However, others, such as school or employee health nurses, work supervisors, clergy, or other responsible persons who do not have strong emotional ties with the patient can sometimes provide DOT.

5. Be aware of techniques patients may use to avoid ingesting medication, such as hiding pills in the mouth and spitting them out later, or vomiting the pills after leaving the treatment center. To ensure that the patient swallows the pills, you may have to check the patient's mouth or ask the patient to wait a half-hour before leaving the treatment center so the medication can dissolve in the patient'sstomach.

Show the patient that DOT can be effective by using testimonials of previous patients. Ask a "graduated" patient who had problems that were similar to your patient's to describe how DOT has worked to help with completing treatment.

Some health care providers think of DOT as a way of punishing the patient. This is a reason the provider may not want to use DOT. Unfortunately, it may also be a reason other providers want to use DOT; that is, they may blame the patient for having TB or for being from a group that is vulnerable to TB, such as HIV-infected, homeless, or foreign-born persons. Think of DOT as a positive service to help your patients complete therapy. To provide DOT positively, tell your patients how it will help them.

Tailor DOT to your patient's particular needs and circumstances. As much as possible, encourage your patients to participate in planning the treatment strategy. For example, they may decide to take medication daily, twice a week, or three times a week; determine the location for DOT; or choose the types of incentives and enablers that they receive. The plan should account for other pressing needs in the patient's life that compete with DOT.

Be creative and flexible in determining how your patients can best be brought into planning their own treatment.

Be creative and flexible in determining how your patients can best be brought into planning their own treatment. For the DOT program to be effective, it needs to be carefully planned and organized, and staff need to be trained, managed, and monitored in their delivery of this service.

There is no manual describing exactly how to set up or conduct a DOT program. Programs come in a variety of forms, although many include the activities outlined by the American Lung Association (p. 20). Ideally, every DOT program will be tailored to the specific characteristics of a treatment center and the patients it serves. Until there is research that evaluates different types of DOT programs and identifies the best type of program, treatment centers are urged to follow the general principles summarized in this section.

Use Incentives and Enablers

Selecting incentives and enablers. Incentives and enablers are widely used to encourage treatment adherence in facilities providing TB services. Incentives are defined as "small rewards given to patients either to encourage them to take their own medicines or to entice them to maintain regular

clinic visits or field visits for DOT. Enablers are those things that 'enable' the patient to receive treatment" (22).

Tailor incentives and enablers to your patient's special needs and interests. Choose them carefully to motivate your patient to carry out the activities necessary to complete treatment. Learning as much as you can about your patients will help you identify the needs and interests that are important to them. An appropriate time to begin using incentives and enablers is after you have established a relationship with your patients.

Barriers to using incentives. Health care workers disagree on the appropriateness of using incentives. Your attitude about using this intervention can enhance or detract from its effectiveness. Some health care workers consider incentives inappropriate because they believe that patients should want to get well and should accept treatment as an obligation to themselves and their community. They believe that incentives are bribes.

Tailor incentives and enablers to your patient's special needs and interests.

At times your patients may also feel that you are attempting to bribe them into accepting treatment. This situation is more likely to occur when you have not established a trust relationship with them and have introduced incentives before you have gotten to know the patients. In most instances, when you use incentives as an expression of caring and concern for your patients' well-being, the likelihood that your actions will be misinterpreted will decrease. Above all, remember that the reason for using incentives is to motivate the patient to complete treatment.

Obtaining incentives and enablers. Incentives and enablers can come from a variety of sources. The Division of Tuberculosis Control, in the South Carolina Department of Health and Environmental Control, has used incentives and enablers for a number of years (see table 1). Staff have used the following approaches to accomplish this goal:

- Acquire funding from the state chapter of the American Lung Association.
- Obtain funds from local sources, e.g., church groups.
- Ask businesses to help with special needs, e.g., food and food coupons.

Table 1
Incentives and Enablers
South Carolina TB Control Program

Money

Food
Applesauce (in which to mix medicine)
Fruit
Homemade cakes and cookies
Big Macs
French fries
Chicken snacks and dinners
Whole, uncooked chickens
Bread
Eggs
Pickles
Vienna sausages
Ice cream
Blow-Pops
Shrimp
Canned food
Oatmeal cakes
Pudding (in which to mix medicine)
Steak dinner
Sausage biscuits
Beverages
Soft drinks
Juices
Milk
Nutritional supplements (e.g., Ensure)
Coffee
Tea

Clothing
Socks
Gloves
Stockings
Sweaters
Coats

Automotive
Battery
Gasoline
Motor oil

Fishing Supplies
Fishing pole
Crickets
Worms

Household
Wood stove
Kerosene
Fuel oil for heat
Smoke alarm
Cooking utensils
Furniture

Services
Helping obtain birth certificate
Washing patient's clothes
Arranging building of wheelchair ramp
Installing wood stove
Helping obtain driver's license
Repairing bicycle

Transportation
Bus fare
Bicycle
Paying a friend for transportation
Staff transporting patient to doctor

Seasonal
Homemade Valentine cookies
Easter baskets
Christmas baskets (food)
Birthday cakes
Thanksgiving hams
Nurses dressed in Halloween costumes
Birthday cards

Children
Reading stories
Painting child's nails
Tea party with child
Playing games
Chewing gum
Charts with stars and stickers
Stuffed animals
Grab bag with assorted treats
School supplies
Storybooks
Basketball
Crossword puzzle books

Personal Care
Contraceptives (e.g., condoms)
Razor blades
Shaving cream
Face cream
Powder
Makeup
Nail polish
Obtaining non-TB medicines

Garden
Flowers
Flower bulbs

Source: *Using Incentives and Enablers in the Tuberculosis Control Program*. Columbia: American Lung Association of South Carolina and South Carolina Department of Health and Environmental Control, Division of Tuberculosis Control, 1989.

- Recruit persons who can contribute time and skills to perform certain activities, e.g., baking cakes and cookies.

- Spend more time with the patient.

Other programs have used different incentives and enablers. The Multnomah County TB clinic in Portland, Oregon, solicited donations from area businesses to enhance their incentive program, which was funded by the American Lung Association of Oregon. Donations were solicited by mail. Particularly popular donations were

- recently expired or soon-to-expire dietary supplement (Ensure) from a pharmaceutical supply company

- pillows and blankets from a hospital (useful to newly arrived immigrants)

- food coupons from area restaurants

- athletic shoes and clothes from an area manufacturer

The North Carolina TB control program paid the rent for a family's house for 1 month to avoid eviction and possible disruption of therapy. Keep in mind that "the essence of this program is not what you bring to the patient, but how you bring it that makes a difference in your relationship and theoutcome of treatment" (22).

Educate Your Patient

Patient education that is well planned and combined with other interventions is essential for ensuring adherence. However, patient education alone has not been successful in improving adherence. It should be used in conjunction with other interventions. The goal of patient education is to influence or change patients' health behaviors by providing them with information that motivates them to follow the treatment plan (23). Bartlett recommended making a "behavioral diagnosis" for each patient and incorporating both instructional and behavioral strategies into each patient's care plan (24). (See table 2 for an adaptation of this approach.)

Make a "behavioral diagnosis" and incorporate both instructional and behavioral strategies into each patient's care plan.

Table 2
Behavioral Diagnosis
Tool for Enhancing Adherence to TB Treatment

Finding of Behavioral Diagnosis	Educational-Behavioral Strategies
Lack of knowledge	Use teaching, repetition, audiovisual aids
Forgetfulness	Obtain help from family or friends Simplify regimen Use combined capsules Associate pill taking with other activities Provide special pill dispensers
Lack of motivation	Point out dangers of nonadherence and benefits of therapy Increase frequency of visits Give DOT Provide incentives
Fear of getting hooked on drugs	Allow extra time to discuss side effects Provide reassurance Make staff available to answer questions that arise during therapy
Lack of skill in pill taking	Instruct patient through guided practice and demonstration Give DOT
Lack of support from family, friends, or significant others	Make home visits Encourage a family member or friend to accompany patient on clinic visits
Poor relationship with health care provider	Develop communication skills (provider) Improve accessibility and continuity of care Provide social support, incentives, and enablers
Insufficient money to pay for health care	Provide free care or facilitate third-party payment Refer to social worker Strive for community change
No sick leave available	Provide clinic appointments in evening, at lunch time, or in early morning
Long clinic waiting time	Have patient see only one person at follow-up visits Keep to scheduled appointment times Separate medical appointments and appointments for drug refills
Medication side effects	Evaluate medication options: change medications or dosages take with or without food
Complex regimen	Simplify regimen Associate pill taking with other activities Use combined capsules Give DOT

Adapted from Bartlett EE, Behavioral diagnosis: a practical approach to patient education, *Patient Counseling and Health Education,* 1982;4(1):29-35.

Providing effective patient education is a challenge for health care providers. First, all people go through distinct stages of learning when they make major changes in behavior, such as taking medication every day. To be meaningful, health information must be appropriate for each patient's stage or level of education and readiness to change (25). For example, persons who do not know they are at risk for TB may not be aware of or concerned about the need for a tuberculin skin test, or they may be afraid of the skin test results.

Some people may ignore individualized instructions to get a tuberculin skin test; others may be influenced only by highly persuasive public messages designed for their reference (e.g., ethnic) group. It seems that when people become concerned about their risk for TB, they then become interested in more specific information about how to obtain a skin test. Hence, education is an interactive process (26).

As part of patient education, tell your patients that you understand that they may have difficulty staying on the medication regimen and help them devise strategies to deal with potential adherence problems. Patients are more likely to pay attention to information when it is relevant to their needs and does not require abrupt changes in their behavior. Patients seem to adapt to changes in daily activities more easily when changes are implemented gradually. The treatment plan may be particularly challenging for patients since many of the treatment methods (for example, DOT) are started abruptly.

Introduce treatment activities gradually, when possible.

Patients may be more likely to follow the treatment plan if they understand their illness and the benefits of treatment. Patient education plans should include information on several topics:

1. patient concerns about the disease, treatment, and follow-up care
2. cause of TB
3. how TB is transmitted
4. diagnostic tests and the meaning of the results
5. treatment recommendations

6. infection control measures
7. follow-up tests and medical evaluations
8. contact testing and evaluation
9. possible problems (such as what can go wrong with treatment and follow-up care)
10. expected benefits of adherence
11. expected consequences of nonadherence

Before you begin teaching patients about TB, assess their knowledge of these topics. If they have some understanding of the disease and its treatment, focus on reinforc-ing accurate information and correcting misconceptions and information gaps.

Use simple, nonmedical terms.

In presenting the information, keep in mind several points. Use simple, nonmedical terms in your explanations and be specific about the behaviors you expect. For example, it is much more helpful to say, "You need to take one of these pills every evening" than to say, "This drug, isoniazid, is a bacte-ricidal agent that is highly active against *Mycobacterium tuberculosis*." Use familiar words in your patient's language or use slang to make the information relevant.

Limit the amount of information you present in any one visit.

Limit the amount of information you present in any one visit. If you attempt a large amount of information, your patients may feel overwhelmed and may retain very little of the information you give them. To avoid this situation, before each teaching session, organize your topics in the order of their importance. In the first session, discuss the most essential topics, including the naming of contacts, in the event the patient is lost to follow-up care. The patient remembers the information pre-sented first more easily than the information presented later. Thus, it is better to discuss the behaviors expected of the patient before explaining the basis for the diagnosis and the prognosis. For example, early in the initial session, you might say, "The most important thing you need to know to get well is that you must take four of these capsules every day."

In later sessions, start by reviewing information you have given before. For example, you can introduce this topic by saying, "As we discussed last time...." These reviews reinforce information and can be used as key points. Remember, communication with your patient should always be two-way; that is, elicit feedback and questions from the patient to ensure that the message sent was received and understood. Use open-ended questions to make sure the message has been understood.

Provide patients with written information. Because patients may forget oral instructions, give them written instructions or basic TB literature. Messages in writing, such as "Take two Rifamate capsules every morning when you get out of bed," reinforce the instructions and increase retention.

Provide patients with written or pictorial information.

Gear the written material to the reading level of your patients. For foreign-born patients who read and speak no English, write the instructions in their native language or use pictorial instructions. For U.S.-born patients who do not read,pictorial instructions can also be useful. Some of these patients may pretend to read by repeating information they have heard. It is important that you not embarrass your patients by confronting them. You can, however, reinforce the message by drawing a picture (e.g., of two pills).

Facilitate Open Discussions

Initiate open discussions with your patient about the treatment plan, including his or her responsibilities as well as yours. At the start of treatment, tell your patient about nonadherence and its effect on the therapeutic outcome and further TB transmission. Listen to the patient's response and identify and resolve any barriers to adherence. For example, you can correct misinformation, reduce side effects by splitting doses or giving drugs at different times, or provide easy-to-open containers (without safety locks).

Determine whether there are cultural barriers to biomedical practices.

If the patient comes from a cultural background that includes the use of folk medicine, determine whether there are cultural barriers to biomedical practices. Sometimes patients seek medical advice from folk healers in their own culture. In some instances, patients may use folk remedies in conjunction with

prescribed medications. For example, in some Asian cultures, TB medicines are considered "hot" and need to be countered with something "cold," such as green leafy vegetables. A discussion about folk beliefs and practices may help you to individualize treatment so that it is acceptable to the patient.

When folk medical practices are safe, consider including them in the treatment plan. For example, some people believe in the healing powers of prayer. These persons may be more willing to take medications after saying a brief prayer when you accept that their belief in prayer is an important aspect of treatment.

Recognize the patient's role in making decisions about treatment.

Patients make independent decisions every day about whether they will take medication or show up for DOT. You must recognize the patient's important role in making decisions about treatment. Develop a partnership with your patient. Effective partnerships require specific behaviors from you (26):

1. Treat patients with dignity and respect.

2. Hire staff from your patients' communities.

3. Communicate clearly so that patients can understand your messages.

4. Avoid criticism, however subtle, of the patient's behavior.

5. Be open-minded about the patient's beliefs and cultural expectations.

6. Listen and try to understand the patient's perceptions, attitudes, and beliefs about TB.

7. Avoid imposing on the patient your values about medical treatment.

8. Understand and fulfill your patient's expectations about treatment, when possible.

9. Reduce as much as possible the distance created by social, economic, or cultural differences between you and the patient.

10. Recognize and address your patients' fears about the illness.

11. Be consistent in what you do and what you tell the patient.

12. Educate staff about the beliefs and expectations of the communities served.

Encourage Social Support

The support and assistance of family, friends, and health care workers can be critical to whether patients complete their treatment. Talk with your patients to identify family members, coworkers, or friends who will support them and your recommendations. Other people, such as a spouse, parent, child, or teacher, may be able to help the patient remember to take medications. Landlords, ministers, bartenders, security guards, neighbors, and many others have effectively supported patients.

Family members may be included in educational sessions so that they also understand the patient's diagnosis and what the patient needs to do. However, avoid making a family member responsible for the patient's adherence. This may be an unfair and complicated burden.

On the other hand, elders, spouses, or others in authority in the family or community may prevent patients from taking medications or may reject or stigmatize the person with TB disease or infection. If this is a problem, it is essential to involve these persons by providing educational counseling about TB and including them in discussions about treatment decisions. Always maintain the patient's confidentiality.

Individualize Medication Regimen

A formal, written adherence agreement — a health contract between you and your patient — may be useful.

Individualize the medication regimen to improve adherence. If possible, simplify and restructure the regimen within acceptable therapeutic limits to coincide with the patient's lifestyle. For example, prescribe intermittent regimens, determine a time of day that is convenient for the patient to take medications, or schedule clinic appointments for DOT at times that are convenient for the patient. Some patients find it useful to monitor pill consumption by checking off doses on a daily calendar.

For some patients, a formal, written adherence agreement — a health contract between you and your patient — may be useful. Your patients should dictate or write in their own words the activities they agree to carry out (such as "take medicine as prescribed"), possibly in return for specific services or incentives from you. List also the activities your patient can expect from you. For some patients, this written commitment increases the likelihood of adherence. Ask your patients to sign the contract next to your signature and give them a copy to keep. Review the contract with your patient periodically to assess how well the two of you are doing and to make changes as needed.

Facilitate Appointment Keeping

Ways to Improve Appointment Keeping

- **Give telephone reminder.**
- **Mail postcard as second reminder.**
- **Schedule appointment at convenient time.**
- **Make home visit to identify and solve problems.**

Different types of reminders can improve appointment keeping. If your patient has a permanent address, it can be useful to send a postcard reminder, mailed so that it arrives 1 or 2 days before the scheduled appointment.

If the patient has a telephone, calls may be preferable because they remove any doubt about whether the patient received the message. Another benefit of using the telephone reminder is that it gives you an opportunity to counsel patients over the telephone and help them overcome scheduling and transportation problems and other obstacles to adherence.

Commercial telephone reminder systems automatically call a patient's number and give a recorded message. An example of this type of system, called TeleMinder-TBC, was used with some success in one study conducted by the San Francisco TB control program.

If a clinic has a chronically low attendance rate, it is important to assess clinic operations, identify barriers to appointment keeping, and make the necessary changes. Clinic visits should be scheduled at times that are convenient, and they should be as brief as possible. Identify and help solve any problems with clinic operations that cause unnecessary delays for patients.

Persons who fail to keep an appointment should be telephoned promptly to schedule a new appointment. If the patient fails to keep the new appointment, an outreach worker or a nurse should visit the patient at home. This visit should be used to counsel the patient and to identify and solve problems that interfere with appointment keeping.

If the patient repeatedly breaks appointments, conduct a case conference attended by all members of the health care team (physician, nurses, outreach workers, and other staff) so that all pertinent information can be considered and the entire staff can contribute to the solution to the problem. The patient may also be included in this conference. A combination of strategies may be required to deal with the chronically nonadherent person, and legal alternatives may be needed (see Legal Remedies, p. 41.)

Provide Comprehensive Services

Some TB treatment centers offer comprehensive services and take a holistic view of patients' needs. These centers use a combination of methods to address treatment adherence. They include DOT as part of their strategy. One of the earliest comprehensive programs held clinics at times and places that were convenient (based on surveys of patients and community leaders), changed appointment schedules to reduce waiting times, referred persons who needed social services, scheduled nurses to make home visits to patients who missed appointments, educated community groups and health department personnel about the need for specialized services, and established health care teams that worked well together and held positive views of their patients. After 5 years of the program, missed appointments decreased from 34% to 6% (27).

Other effective comprehensive programs have included well-integrated medical teams, a system of coordinating with other community resources, and incentives or enablers such as food, transportation, or additional medical services. Another successful clinic employed a pulmonary nurse specialist and a nurse epidemiologist to provide careful case management. The nurses attempted to establish strong relationships with patients and to understand their beliefs about TB. Scheduled appointments reduced waiting time, and patients were reminded of appointments for the following day and received a visit closely following missed appointments. Patients were given money for transportation and were referred for assistance with social, financial, and other medical problems as needed. Treatment was simplified by using combination capsules containing two drugs (28).

In general, comprehensive services include

- teams of personnel who assume responsibility for continuity of care, careful case management, and follow-up
- clinic times and locations that are accessible and convenient for patients
- provision of health or social services to patients
- short-course treatment regimens that include supervised therapy

This type of service has been shown to improve treatment success even with patients who typically would not complete treatment (3, 29, 30).

Problem Solving

Social, economic, and health problems other than TB may impede the patient's progress toward completing TB treatment. To minimize the effects of these problems on treatment, develop a problem-solving strategy to collect relevant information that will help you identify problems, anticipate potential problems, and initiate appropriate interventions. Address the problems systematically. One example of a basic approach to problem-solving has the following five steps:

Effective strategies for improving adherence remove the specific barriers to adherence that the patient is experiencing.

1. Identify problems.
2. Analyze the causes of the problems.
3. Form objectives for an action plan.
4. Develop and implement the action plan.
5. Evaluate the implementation and outcomes of the plan.

1. Identify problems. Assess the patient for problems by obtaining information about the patient from several sources: health assessments, review of medical records and laboratory reports, ongoing interviews with the patient and significant others, home visits, and feedback from referral agencies (such as substance abuse treatment centers and housing agencies). Review and analyze this information for evidence of barriers to treatment completion, such as the patient's inability to keep clinic appointments because of work schedule. Further review this information to identify patient strengths and other factors, such as strong family support that may facilitate treatment completion.

Identify problems.

2. Analyze the causes of the problems. After you have identified the problems, prioritize them and discuss them with your patient. The purpose of the discussion is to give you an opportunity to present the problems as you perceive them and to give the patient an opportunity to agree or disagree with your list of problems and to identify other problems that may not be apparent to you. The discussion will also give you an opportunity to discuss the causes of the problems. List the possible causes and rank them from most probable to least

Analyze the causes of the problems.

probable. Develop a plan of action for dealing with the most probable causes of your patient's problems.

3. Form objectives for an action plan. Objectives are statements that describe a desired outcome or performance; they are statements of what should be or should occur (statements of intent). Correctly stated objectives should contain these criteria (31):

Form objectives for an action plan.

- a time frame for completing the objective
- an active verb (e.g., *give, identify, explain*)
- the desired activity or action
- criteria for evaluating achievement

An example of a measurable objective: Starting in January and continuing until therapy is completed, Mrs. Jones will meet the outreach worker at Grant Park every Tuesday and Thursday at 10 A.M. to receive DOT.

4. Develop and implement a plan of action. At this point, begin to plan an appropriate course of action. This consists of interventions to eliminate the causes of each problem (several strategies have been discussed elsewhere in this booklet) and help you meet the objectives for your plan. Encourage the patient's input in finding solutions. Keep in mind that the best solution may be a compromise, including elements of what you think is the best approach and what the patient thinks is best.

Develop and implement a plan of action.

To individualize the interventions, consider the patient's daily routine, occupation, and social networks. Develop a plan of action that is convenient for the patient and that allows the patient to maintain as much independence as possible. For the objective in step 3, the interventions necessary to carry out the desired activities might include providing Mrs. Jones with bus tokens so that she can get to Grant Park for DOT.

5. Evaluate the implementation and outcomes of the plan. The evaluation of the plan of action measures the success of the problem-solving strategy. It answers the following questions:

Evaluate the implementation and outcomes of the plan.

- Has the intervention been implemented?
- Has the objective been achieved, or has progress toward achievement been made?
- Has the cause of the problem been eliminated?
- Has the problem been solved?

The evaluation of the interventions is ongoing. Problems will be resolved, and new problems may emerge throughout the treatment period. Modify interventions any time you recognize them as ineffective. Consult with or make referrals to other health care providers to ensure the completion ofTB treatment.

Effective strategies for improving adherence are those that remove the specific barriers that a person is experiencing. Thus, gaining an understanding of the difficulties associated with behavior change and taking time to get to know your patients — their experiences with illness, their cultural backgrounds, and the communities from which they come — are essential.

Adherence by Children and Adolescents

Children with TB present specific problems for adherence. However, there is very little information about the rates of adherence among children or methods for improving it. Many children with TB have few or no symptoms of the disease, and many do not experience a dramatic improvement in symptoms when given appropriate treatment. Because of the characteristics of the disease in children, you may have difficulty convincing parents that their children are ill and need treatment and that the treatment needs to be given as prescribed (32).

Strategies for Improving Adherence

To improve adherence among children, work with the parents or caregivers who will administer medications to young children. You cannot assume that parents will give medications to their children as prescribed; some parents are nonadherent (it is difficult to get children to take medicines that taste unpleasant). Every measure to ensure adherence in patients must also be taken to ensure that parents give needed TB medications to their children. Consider additional measures to accommodate the special needs of young children.

Provide anticipatory guidance.

1. Provide anticipatory guidance**.** Talk with parents about the potential problems they may experience with their children when TB treatment is initiated. Children may

   - resist taking medications
   - have difficulty swallowing pills and capsules, the common form of TB medications
   - experience adverse reactions to the medications

When parents are aware of the potential problems that can arise during their child's treatment, they are better able to cope with the problems and assist with the treatment.

Give DOT.

2. Give DOT**.** Consider giving DOT to children with TB when you are unable to ensure that their parents or caregivers are administering the medications as prescribed. Supplement DOT with incentives and enablers (such as coloring books and toys) to encourage cooperation from the child.

Give TB medications in easy-to-take preparations.

3. Give TB medications in easy-to-take preparations. Rifampin (RIF) can be made into a liquid suspension by the pharmacist. Isoniazid (INH) can also be prepared as a suspension, although its stability varies. INH and pyrazinamide (PZA) pills can be crushed and given with small amounts of food; RIF should be taken on an empty stomach (33).

Adherence by Adolescents

Adolescents may be responsible for taking their own medications, but they are also at high risk for poor adherence. Because of their concerns about the opinions of peers, adolescents may be particularly embarrassed about having to take TB medications. Also, they may not feel threatened by TB and may not take the condition seriously. For these reasons, adolescents are a high priority group for DOT.

Children and adolescents need carefully individualized treatment plans. Be vigilant in monitoring adherence and creative in finding ways to ensure adherence.

Legal Remedies

Patients' Rights and Due Process

As a general rule, people in our society have the right to refuse to follow health advice. However, persons with infectious TB may lose the right to refuse such advice — that is, instructions to complete prescribed TB treatment — if health officials believe these persons are putting the public at risk for infection. Patients who are unwilling or unable to adhere to treatment may be required to do so by law. Since state governments have legal jurisdiction over TB control activities such as treatment protocols for nonadherent patients, refer to the laws in your state for those provisions.

The Advisory Council for the Elimination of Tuberculosis (ACET) defines nonadherent behavior as the inability or unwillingness to follow a prescribed treatment regimen (34).

Examples of nonadherent behavior are

- failing to report for DOT
- refusing medications
- taking medication inconsistently
- missing clinic appointments

Notify the appropriate health official when patients are nonadherent. The health official or designated representative should determine the reasons for the nonadherence and begin the appropriate interventions.

Although legal remedies for nonadherence are available in some areas, they should be used only when less restrictive measures have failed. When legal remedies are used, measures should be taken to ensure that the rights of the patient are protected. Patients subjected to these proceedings should be represented by legal counsel.

When legal remedies are used, measures should be taken to ensure that the rights of the patient are protected.

The legal remedies commonly used by public health officials to address treatment nonadherence are court-ordered DOT and involuntary isolation, hospitalization, and confinement.

Progressive Interventions to Ensure Treatment Completion

Progressive Interventions

- **Give DOT supplemented with other interventions.**
- **Obtain court-ordered DOT.**
- **Obtain court order to confine patient to treatment facility.**

Commitment is defined as the confinement of a person who has infectious TB or who is not infectious but has not adhered to prescribed treatment. The purpose of commitment is to prevent the development of drug-resistant organisms or to ensure that a person receives a complete course of treatment.

ACET recommends that before committing patients to involuntary confinement, state TB control programs should adopt a step-by-step treatment plan that progresses from voluntary participation to involuntary confinement (34). The plan should begin with an assessment of the potential reasons for nonadherence and procedures for addressing the identified obstacles which include the use of DOT, incentives, and enablers.

If the patient does not adhere to DOT voluntarily, the next step may be DOT that is ordered by a public health official or a court. TB control programs should not initiate procedures for confining patients to a treatment facility until after the patient has demonstrated an inability or unwillingness to follow the treatment regimen.

Involuntary commitment or isolation for inpatient treatment should be viewed as a last resort. However, when a patient with infectious TB refuses treatment and voluntary isolation, emergency detention to isolate the person is appropriate.

Criteria for Determining the Need for Involuntary Confinement

When determining whether the legal commitment of a person with TB is necessary to protect the public, local health officials should determine whether the person is at substantial risk of infecting others (now or in the future). To determine this risk, assess the patient's situation by considering these factors:

1. Clinical evidence such as laboratory results (acid-fast bacilli sputum smears and sputum cultures)

- clinical signs and symptoms of infectious TB
- abnormal (cavitary) chest x-ray

2. History of nonadherence for reasons not related to treatment or delivery system failure

3. Risk of infecting others

The commitment order should require the isolation of the person with infectious TB until the patient is determined to be noninfectious. This decision should be based either on laboratory results demonstrating that the person is smear negative and asymptomatic or on the local health officer's determination that the person has completed a course of therapy consistent with the most recent recommendations of the American Thoracic Society and CDC (35).

The patient should also be ordered to receive treatment in a hospital or other appropriate facility until cured, unless the person's voluntary completion of the ordered therapy can be ensured. If the patient refuses to consent to the ordered treatment, the health officer should have the authority to extend the commitment order as necessary.

Final Note

When asked for a recommendation for improving patient adherence to TB treatment, an experienced public health nurse from Arkansas said, "What we do is whatever it takes!" These words seem to summarize all the preceding strategies and to embody a philosophy that no longer accepts nonadherence as inevitable and tolerable. Doing whatever it takes to ensure the completion of adequate therapy is a challenge, but one that must be successfully met if this curable and preventable disease is to be controlled.

A Quick Reference to Strategies for Improving Adherence

Quality of Interaction with the Patient

1. Create a partnership.
2. Ask patients whether or not they take TB drugs; don't assume they do.
3. Give each patient adequate time at every visit.
4. Don't intimidate or frighten the patient; be positive.
5. Get oral and written commitments from the patient.
6. Treat the person, not just the disease.
7. Understand and address different cultural values and beliefs.
8. Adapt treatment to lifestyle.
9. Make social service referrals.

Patient Education

1. Give vital information first in the patient interview.
2. Be concise and clear with instructions; the patient is likely to be anxious after hearing the diagnosis.
3. Be clear from the start about the length of the regimen.
4. Don't overload the patient with too much information at one time; avoid jargon.
5. Use educational materials that are culturally and linguistically appropriate for the patient.
6. Be alert for signs or indications that the patient may not be literate.
7. If using an interpreter, be sure that the interpreter is familiar with the patient's culture.

8. Assess the patient's beliefs about TB; when possible, integrate beliefs into the treatment plan.

9. Review instructions; question the patient to ensure understanding.

10. Describe the specific adherence behaviors required.

11. Clarify the patient's questions and respond clearly.

12. Give written instructions.

Treatment

1. Schedule the initial appointment soon after diagnosis.

2. Use appointment reminders.

3. Follow up quickly on missed appointments.

4. Tailor the regimen to the patient's needs; allow the patient some options.

5. Keep the regimen as simple as possible.

6. Give clear instructions about medication side effects.

Clinic Operations

1. Ensure a physical environment that is comfortable to patients.

2. Ensure that all staff are supportive of patients.

3. Ensure that schedules and practices are tailored to the patients' needs.

4. Ensure that records management, pharmacy, and lab services are efficient and that they do not inconvenience patients.

5. Nurture staff morale; provide training as needed.

6. Provide for confidentiality of patient information.

7. Provide appropriate clinic services that match the demographic features of the patient population (e.g., temporary housing for homeless patients).

8. Provide culturally sensitive staff.

9. Provide interpreters if needed.

Adapted from Sumartojo E, Adherence to the treatment plan: drawing on the research, in: Cohen FL, Durham JD, editors, *Tuberculosis: A Sourcebook for Nursing Practice*, New York: Springer.

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Appendix

Testing for the Presence of TB Drugs or Their Metabolites in Urine

Several simple, reliable, and relatively inexpensive tests for demonstrating the presence in urine of TB drugs or their metabolites have been developed. Methods for performing a variety of tests, by Eidus and Ling, were published in a World Health Organization technical bulletin in 1969. (1). More recently, others have published the methods and results of testing urine for the presence of isoniazid (INH) and its metabolites, pyrazinamide (PZA) and its metabolites, rifampin and its metabolites, and ethambutol (EMB) (2-6).

A procedure for detecting the INH metabolite isonicotinic acid in urine by using a reagent-impregnated paper test strip was described by Kilburn et al (5). This dipstick test measures the presence of the most widely used TB medication and can be conveniently incorporated into TB patient care (see instructions at end of the appendix). The Bacto INH test strips, for example, are available from Difco Laboratories, in Detroit, Michigan. The Potts-Cozart method (6), an alternative to the test strip method, is based upon a similar chemical reaction, may be less expensive, and was used by the Arkansas Department of Health.

Note: Caution is needed in the interpretation of results of urine tests for drug metabolites. For example, the reliability of INH test strips in **clinical situations** depends upon 1) the sensitivity and specificity of the strips in detecting the presence of isonicotinic acid in urine, 2) the rate at which individual patients metabolize INH, and 3) the timing of the test in relation to the time when pills are ingested.

The INH test strips were shown to be 99% sensitive (very few false-negatives) and 100% specific (no false-positives) for **one** group of patients when urine was collected 20 to 24 hours after pills were ingested, and it is believed that for most patients the test is reliable when conducted at any time within 24 hours after pills are ingested. However, the normal rate of **INH metabolism differs in various patient populations,** and the average time required for clearance of INH from the urine can be less than 4 hours.

In addition to normal differences between patients, which are constant over time, temporary factors such as fluid intake, illness, or dehydration may affect INH clearance and lead to false test results.

How to Test Urine for INH and Its Metabolites by Using Bacto INH Test Strips

1. Store the test strips in the refrigerator at 2^0 to 8^0 C until ready to use.

2. Ask the patient to collect a urine specimen in a small container.

3. Each paper test strip is enclosed in a small plastic tube. Take one test strip enclosed in its sealed plastic tube from the jar. Cut off one corner of the plastic tube at the arrow end of the strip.

4. At the opposite end of the strip from the arrow, squeeze about 1/2 inch of the plastic tube between thumb and forefinger (to create a suction) and insert the cut end of the tube into the urine specimen, below the surface.

5. Release pressure between thumb and forefinger, drawing urine into the plastic tube. Liquid should rise in the tube to cover the arrow on the paper strip.

6. The tube may now be left to float in the urine container or may be transferred to a test tube.

7. Keep the tube at room temperature and observe results in 15 to 30 minutes.

8. Look for a blue, purple, or green color on the strip and in the liquid in the tube. These colors are a positive test result, indicating the presence of INH or its metabolites in the specimen. If the reaction is weak, only the paper strip may appear colored.

Note: Use Bacto INH control disk each time a urine test is conducted. (See instructions on the package ofcontrol disks for storage and use recommendations.)

References

1. Eidus L, Ling GM. Tests for the detection of antituberculosis drugs or their metabolites in the urine. WHO Tech Bull 1969;76:1-9.

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4. Ellard GA, Grenfield C. A sensitive urine-test method for monitoring the ingestion of isoniazid. J Clin Pathol 1977;30:84-7.

5. Kilburn JO, Beam RE, David HL, Sanches E, Corpe RF, Dunn W. Reagent-impregnated paper strip for detection of metabolic products of isoniazid in urine. Am Rev Respir Dis 1972;106:923-4.

6. Henderson WT. The development and use of the Potts-Cozart tube test for the detection of isoniazid (INH) metabolites in urine. J Ark Med Soc 1986; 82(10):445-6.