

SCREENING PROGRAMS



The primary goals of tuberculosis screening programs are to:

- ▶ Identify those with active tuberculosis
- ▶ identify from amongst the infected, those at high risk of progression from infection to disease who would benefit from preventive therapy

All screening activity *must* be accompanied by a plan for follow-up care of persons identified as having active disease or latent infection.

The primary focus of screening should therefore be on groups for which tuberculosis rates are considerably higher than the general population.

Screening programs may also be developed:

- ▶ to establish baseline tuberculin skin test results for individuals who will require periodic re-testing, such as those who have an occupational risk of exposure
- ▶ for disease surveillance purposes

Groups Requiring Screening

- 1. Foreign-born individuals**, referred for medical surveillance by Citizenship and Immigration Canada. No comprehensive list of TB endemic countries can be provided here as it is never static. As economic and health conditions change, so does the risk for diseases such as tuberculosis. Generally, countries with health standards similar to Canada's will not carry a high risk for TB.
- 2. Individuals in health professions** and others in the community or facilities/institutions, who work closely with populations that are at higher risk for tuberculosis disease (see #6 below). In general, the latter would include the elderly, the homeless, substance abusers, foreign-born individuals from TB endemic countries and Aboriginal Canadians (including status and non-status Indians, Inuit, Métis).
- 3. Residents in institutional** settings such as correctional facilities, alcohol and drug rehabilitation centres, continuing care centres where the elderly reside.
- 4. Children living and attending school on reserve.**
This program is a reflection of the relatively higher rates of tuberculosis infection and disease in the aboriginal population. It not only identifies children who have become infected, but gives valuable clues regarding TB activity within each community.
- 5. Individuals in the community who are at increased risk for recent infection** with the tubercle bacillus, including those in close contact with a person with infectious tuberculosis and travellers to TB endemic countries.

6. Individuals who have medical conditions which put them at increased risk of infection progressing to disease, including:

- HIV infection
- carcinoma of the head and neck
- lung cancer
- hematologic malignancies—lymphoma, leukemia
- diabetes—especially if insulin dependent and poorly controlled
- chronic corticosteroid use (at least 15 mg/day for > 2 weeks)
- alcohol abuse
- IV drug abuse
- gastrectomy
- end stage renal disease – especially dialysis dependent renal disease
- silicosis
- organ transplant candidates (because they will be on immunosuppressive drugs)
- other immunosuppressive disorders or disorders requiring the use of immunosuppressive drugs
- radiotherapy
- malnutrition (i.e. weight less than 90% of ideal)

- Note: Especially at risk are those who have these risk factors and also have an increased risk of being infected by virtue of belonging to a high-risk group such as the elderly, aboriginals, homeless or other inner-city persons, foreign-born persons from TB endemic countries or Canadian-born travellers to TB endemic countries.

7. Individuals with a history of active TB who did not receive adequate treatment as determined by Tuberculosis Control (e.g. TB prior to the mid 1950s, when satisfactory drug combinations for treatment did not exist, or incomplete outpatient treatment at any time).

Screening and Diagnostic Tools

For the purpose of screening, diagnostic tools are used to rule out the presence of disease prior to recommending and starting treatment for latent TB infection. A combination of these diagnostic tools can be used to confirm active TB disease in clients with symptoms consistent with active TB.

The sequence of the screening components is dependent on the reason for screening. (For example, clients awaiting continuing care placement must have a chest radiograph prior to admission, and if the radiograph or symptoms suggest active disease, sputum samples for AFB smear and culture should be submitted prior to admission. Tuberculin skin testing may be done after admission.) Generally however, the program should consist of the following:

- ▶ history and symptom inquiry (this should always be the first step)
- ▶ tuberculin skin test (TST)—to identify individuals who have been infected by tubercle bacilli
- ▶ chest radiograph if history and/or tuberculin skin test indicate necessity
- ▶ sputum submitted for AFB smear and culture if symptom inquiry, chest radiograph and/or tuberculin skin test indicate necessity

History and Symptom Inquiry

Information obtained through history and symptom inquiry assists in determining the need for further screening. (For example, a reliable history of previous positive TST or old TB indicates TST should not be repeated). This information is also integral to ensuring appropriate referrals are made to a TB specialist.

History is important in assessing the risk of infection and the likelihood of progression from infection to disease, as well as the possibility of old or current disease. Important areas to explore would include:

- ▶ exposure to tuberculosis (past or recent)
- ▶ previous active tuberculosis and treatment
- ▶ previous preventive therapy
- ▶ previous tuberculin tests, BCG, chest radiographs
- ▶ country of birth
- ▶ travel to countries which may have a high incidence of TB
- ▶ any time spent in a correctional facility
- ▶ intravenous or other substance abuse
- ▶ other risk factors for infection (e.g. aboriginal, elderly, homeless, health care worker)
- ▶ general health status, and risk factors for progression of infection to disease (see page 2-4)

Symptom inquiry will assist with interpretation of other components of the screening process, and the need for more immediate referral. Symptoms to alert the practitioner to the possibility of active TB disease would be:

- ▶ chronic cough lasting more than 3 weeks, especially if productive
- ▶ weight loss
- ▶ night sweats
- ▶ fever (often low grade)
- ▶ fatigue
- ▶ anorexia
- ▶ hemoptysis
- ▶ suggestive extra-pulmonary signs or symptoms in a high risk patient

If symptoms suggest the possibility of disease:

- submit 3 separate sputum samples for AFB smear and culture (see page 2-12)
- refer to physician for chest radiograph (**PA and Lateral**) and further medical assessment
- review tuberculin reactor status and administer tuberculin skin test if status unknown or previously non-significant
- Note: Except in children, the use of a TST in the diagnosis of disease is quite limited. However, it may aid in the interpretation of other information.

Non-respiratory (often referred to as extra-pulmonary) tuberculosis can involve any organ. Symptoms are dependent on the organ system affected. (For example, TB of the kidney may cause frequency, dysuria, flank pain, and hematuria, while TB of the spine may cause back pain.)

- Non-respiratory TB is seldom infectious, and although the infected individual may be ill and require treatment, he or she does not as a rule, pose a public health threat.
- Investigation to identify the source of the infection is still indicated, as it may indicate an unidentified case of active infectious tuberculosis in the community.
- As with cases of infectious TB, medications for treatment of non-respiratory tuberculosis are provided free of charge by Alberta Health and Wellness.

For the purposes of this manual, respiratory tuberculosis includes pulmonary, laryngeal, miliary, pleural, primary and "other" respiratory TB.

Tuberculin Skin Test

The Mantoux test, using Protein Purified Derivative (PPD) is the only approved method of tuberculin skin testing in Alberta. Other tests, such as multiple puncture tests are not as accurate and are not acceptable. For detailed information about tuberculin skin testing, see the *Tuberculin Skin Test Guidelines* and the *Tuberculosis Teaching Package*.

The tuberculin test is a useful tool for identification of individuals who have been infected with the tubercle bacillus. By itself, it has no value in the diagnosis of tuberculosis disease. It may, along with other information, contribute to a diagnosis of disease activity in children. Other diagnostic tools (i.e. sputum for AFB, x-ray, symptom inquiry) are the principle means of screening for active disease.

PPD is supplied by Alberta Health and Wellness to RHAs free of charge for:

1. Organized province-wide screening programs that are the responsibility of Public Health such as:
 - screening of healthcare workers on employment and if recommended because of high risk of exposure (but not for routine screening of staff unless the workplace has been assessed as a high risk facility, see *Guidelines for Preventing the Transmission of Tuberculosis in Health Care Facilities and other Institutions*)
 - screening of clients in continuing care facilities as part of the admission screening
 - screening of contacts of cases of active tuberculosis
 - screening of inmates and staff in correctional centres
2. Regional programs that reflect public health practice, approved by the regional medical officer of health to address specific demographics. For example, screening of grade 1 children in northern off-reserve communities, newcomer's clinics that are held to address the medical needs of immigrants.

"Healthcare workers" includes students and volunteers.

PPD is not currently supplied for travellers, occupational health programs outside of those referred to on page 2-3, #2 or diagnostic purposes (either in facilities or physician offices).

Precautions and Adverse Reactions

Pregnancy

While pregnancy is not a contraindication to the administration of a tuberculin skin test, **routine screening tests** in the absence of symptoms, HIV infection, or recent contact, are usually deferred until after delivery.

- ▶ However, when the woman is HIV positive, is part of a **contact investigation** or has **symptoms** suggestive of TB, testing should *not* be delayed.
- ▶ If a woman is pregnant and is thought to be newly infected or is HIV co-infected, preventive therapy should not be deferred until after pregnancy.

Allergic reactions to PPD are very rare but not unheard of. Epinephrine Hydrochloride Solution (1:1000) must be readily available when administering a tuberculin skin test.

Pain, itchiness, discomfort at the site may occur, and should be treated with the use of cold compresses.

Adverse reactions should be reported to Alberta Health and Wellness, Tuberculosis Control, using the Provincial Adverse Reaction reporting form.

Administration

The TST is performed by intradermal injection of 0.1 ml of 5 tuberculin units (5TU) of Purified Protein Derivative (PPD).

It must be administered and read by a health care professional who has had additional training and experience in the technique of intradermal injections, interpretation of tuberculin skin tests, and appropriate referrals and/or follow-up.

Self-reading of a tuberculin skin test is not an acceptable practice, and should never be allowed.

Interpretation

Note: Reading of the TST should be done 48 to 72 hours after administration. Delayed reactions (those which look significant after 72 hours) should be repeated. Ensure reading is 48 to 72 hours after administration, and interpret the reading at that time according to the following.

- ▶ <5 mm of induration is read as **non-significant**. On occasion, when an individual is at very high risk of latent infection and has an immunocompromising condition such as HIV, they may still be a candidate for preventive therapy even with a TST reading of less than 5 mm induration.
- ▶ 5-9 mm of induration is **significant** if the test was performed on:
 - individuals with HIV infection, or others who are severely immunocompromised
 - close contacts of a person with infectious TB disease
 - persons whose chest radiograph suggests disease (current **or** old disease, see page 2-11 for x-ray indicators of disease)
- ▶ 10 mm or more of induration is considered **significant** in all other persons.

Not all significant reactions are due to *M. tuberculosis*. See page 3-3

Tuberculin skin test conversion

- ▶ **TST conversion** in a healthy individual who is not a known close contact of a case of active TB, is defined as a reaction of 10 mm or more, when an earlier test (within the previous 2 years) resulted in a reaction of less than 5 mm.
- ▶ If a test result within the previous 2 years was between 5 and 9 mm in a healthy individual, the definition of conversion becomes more difficult.
 - If the reason for the current testing is contact with an infectious case of TB, an increase of 6 mm or more is considered to be a conversion reaction.
 - If the reason for the current testing is routine screening an increase of 10 mm or more is considered to be a conversion reaction.

2-step Tuberculin Skin Testing

This procedure is used to identify individuals who were infected in the remote past, but now have decreased sensitivity to tuberculin. It allows one to distinguish between a booster response to remote previous infection and a conversion caused by recent infection (of the *Tuberculin Skin Test Guidelines*).

Indications for 2-step TST

Two-step testing should be performed for individuals who have no previous documentation of a 2-step **and** who:

- ▶ will be subsequently tested at regular intervals (such as workers within moderate or high risk health care facilities)
and/or
- ▶ have had (or likely to have had) BCG vaccine in the past
and/or
- ▶ are over 55 years of age

2-step testing is not recommended during contact investigation, as it is not possible to make a distinction between a boosted reaction and a conversion.

BCG in the past is not a contraindication to 2-step testing.

"2-step testing" is inappropriate in the context of a contact investigation.

Repeated testing (either single TST or 2-step) cannot cause an uninfected individual to develop a significant skin test.

Follow-up of a significant TST reactor

All reactors who have a significant tuberculin skin test have potentially been infected with tubercle bacilli.

- ▶ Report reactors to the designated person or persons responsible for tuberculosis management according to regional/zone protocol, to ensure appropriate referrals.
- ▶ Complete history and symptom inquiry, if it has not already been done.
- ▶ If client is coughing, submit sputum specimens for AFB smear and culture.
- ▶ Arrange for chest radiograph (and medical assessment if needed) if one has not been done in the preceding 6 months.

Note: If operational requirements do not allow for consistent reading of tuberculin skin tests by a nurse experienced in administration, reading and follow-up, **all significant reactions** must be confirmed by an experienced public health nurse before referral to TB Control.

Radiographic Investigation

All those with a significant tuberculin test should have a chest radiograph to rule out current or past disease, but they do not all need to be referred to Tuberculosis Control.

- ▶ Ensure PA and Lateral views are ordered on anyone under the age of 15 and anyone with symptoms suggesting active tuberculosis.

**Refer to TB Control or the Calgary or Capital Health TB Clinic
if one of the following applies:**

- ▶ **the individual meets the criteria to be considered as a candidate for preventive therapy (see page 5-5, “candidates for preventive therapy”)**
- ▶ **the individual has symptoms of TB - collect 3 sputums, refer to family physician for medical assessment (including chest radiographs), ensure radiograph is forwarded to TB Control with a referral form if appropriate.**

Referral to Alberta Health and Wellness, TB Control

(for RHAs other than # 3 or # 6)

“Referral to TB Control” means ensuring a radiograph is submitted to TB Control, accompanied by information including history, symptom inquiry, tuberculin status and any other relevant information. From this assessment, the TB Physician will determine whether a TB Clinic appointment needs to be made.

The “Tuberculosis Referral Form” (see Appendix 14-3) should be completed and used as a requisition to order a chest radiograph for those whose radiographs need to be reviewed by a TB Physician. Using this form ensures that radiographs and reports are sent to Alberta Health and Wellness Tuberculosis Control, and that information the physician needs to assess the radiograph is available to him.

Referral to the Capital Health or Calgary TB Clinic

The Capital Health Authority (#6) and Calgary Health Region (# 3) refer to their respective clinics according to local protocol.

Referral to Family Physicians

Individuals with significant reactions to tuberculin tests who do not appear to be candidates for preventive therapy or who have symptoms suggestive of tuberculosis, should be referred to the family physician for assessment, including radiographs. TB Medical Consultants are available for physician consultation when necessary (see Appendix 13 for important contacts).

- ▶ Ensure this referral includes the reason for screening and the purpose of the referral, and request a copy of chest radiograph reports. If these reports indicate any of the radiological descriptors of tuberculosis, ensure appropriate referral to Tuberculosis Control or one of the TB Clinics as appropriate.

When individuals with significant reactions do not have a family physician, or do not have health care insurance (e.g. foreign students), referral for assessment becomes more difficult.

- ▶ Regional staff should try to assist the individual to find a family physician. If this is not possible, the regional MOH has the option of ordering the radiograph, ensuring that there is local reading and reporting of radiological findings.
- ▶ The region carries the financial responsibility in the case of an individual who does not have health care coverage.

Radiological Descriptors of Tuberculosis Infection or Disease

When radiograph reports indicate any of the following terms, the radiograph should be seen by a specialized tuberculosis physician. Direct the radiology department to forward current and old radiographs (with the radiology report **and** a referral form with the most recent tuberculin status) to Alberta Health and Wellness Tuberculosis Control, the Capital Health TB Clinic or the Calgary TB Clinic, as appropriate.

Recognizing that one may not be able to distinguish active TB from inactive TB based on radiograph alone, when an x-ray report indicates one of the following, a referral should be made to TB Control or the Capital or Calgary TB Clinic.

- Unilateral apical pleural thickening or bilateral but unequal apical pleural thickening, particularly if irregular or calcified
- Pleural calcification or fibrocalcification
- Old granulomatous disease or old tuberculosis (does not include single, isolated granuloma)
- Upper lobe fibronodular abnormality
- Thoracoplasty
- Suspicion of current active disease

Sputum Collection For Acid - Fast Bacilli (AFB)

Note: Collect 3 sputum specimens if the client is symptomatic and at least 1 if they have no symptoms. An “on the spot” specimen is still better than none.

Purpose

- ▶ to allow for a definitive diagnosis of pulmonary tuberculosis and to estimate the degree of infectiousness
- ▶ to enable the performance of drug susceptibility tests that will, in turn guide treatment
- ▶ to enable DNA fingerprinting of the organism for epidemiological purposes

If clients have difficulty producing sputum, see Appendix 3 for detailed instructions on inducing sputum.

Procedure

Note: Any time a health care worker is assisting a client suspected of having active TB disease to produce sputum, appropriate precautions should be taken to protect the worker and others in the home, hospital or clinic. Sputum specimens should be collected in a separate room with air vented to the outside, or in the open air. Masks capable of filtering 95% of particles of 1 micron or larger should be worn.

1. Label specimen bottle clearly, with client’s name, date of birth, and TB file number if known.
2. Provide the client with the following instructions for collection:

Collect first morning, deep cough specimens. When 3 sputum specimens are requested, collect the samples on 3 consecutive mornings in 3 **separate** containers. (Do not combine several specimens in one container or submit cumulative specimens collected over a period of 24 hours or more).

Before coughing up sputum, clear the back of the throat of mucus.

Cough deeply and vigorously to raise sputum from the lungs. If there is difficulty raising sputum, breathe through the mouth as deeply as possible, hold the breath for a moment and cough forcefully and deeply. Spit out everything from the mouth into the container.

Rinsing the mouth with water should be discouraged. It is not uncommon for water to be contaminated with nontuberculous mycobacteria.

Submit specimens for analysis as soon as possible after collection. Unless they will be processed within 1 hour, refrigerate the specimens until they can be sent to the laboratory, but be sure they do not freeze.

Tighten lids on the containers and record the date and time of specimen collection on the bottle label. Wrap the individual sputum container in absorbent material (e.g. cotton batting), and place it in the ziplock biohazard bag.

3. Complete the lab requisition, including the name of the attending physician and TB file number if known. Ensure the names on lab requisition and sputum container match and place the requisition in the sleeve of the biohazard bag (not in the interior of bag with the specimen container).
4. Forward properly packaged sputum specimens to the Provincial Laboratory according to regional protocol. All specimens must be placed in a container that will not allow escape of any contents under normal conditions of handling and transport (e.g. plastic container with a lid or metal tool box).

Results of examination for AFB (smear) should be available to the specimen submitter within 24 hours of receipt by the laboratory.

- ▶ Results of culture examination, and other confirmatory tests may take several days to several weeks. All culture positive specimens will automatically be tested for susceptibilities to first-line drugs to ensure adequate treatment.
- ▶ All new positive smears and cultures should be reported immediately to Tuberculosis Control, the forwarding physician and the local MOH.
- ▶ If a positive smear is suspected of being due to a nontuberculous mycobacterium, then a special request may be made to have the provincial laboratory perform a nucleic acid amplification (NAA) test which will allow immediate distinction between *M. tuberculosis* complex organisms and other mycobacteria.

Screening Guidelines For Continuing Care Facilities

The elderly are at risk of being infected with tubercle bacilli by virtue of having lived at a time when TB was very common; with the waning of immunity that comes with age or co-morbidity, these dormant bacilli may re-activate. Those living and working in residential and continuing care centres are at risk because of frequent close contact with the elderly. Screening in this population is aimed at identifying active cases, preferably before they enter the facility, and preventing potential new cases.

Recommendations for Residents

Pre-admission Screening

1. A chest radiograph must be performed within 6 months of **application for admission**. This is a legislated requirement for Continuing Care Facilities regardless of tuberculin status.

This radiograph should be ordered by the physician as part of the pre-placement physical exam. If it is not already done, refer the client back to the physician.

If admission is delayed, and occurs 12 months or more from this radiograph date, another radiograph must be performed prior to admission.

Chest radiograph reports are reviewed by the placement review committee and the receiving facility to ensure that **appropriate** referrals have been made (**see page 2-10 for referral criteria**).

2. History and symptom inquiry is done to determine past or recent exposure to tuberculosis, past tuberculosis treatment, or the probability of active TB. If symptoms suggest current active tuberculosis, the interviewer should:
 - collect sputum specimens for AFB smear and culture, using auger suction or other means if necessary (see page 2-12)
 - arrange for the administration of a TST (if no history of previous significant reaction)
 - refer to the family physician for assessment and referral if necessary
3. Tuberculin skin test should be performed prior to admission if the resident:
Has one of the following conditions that would place them at higher risk of infection progressing to disease
 - HIV/AIDS
 - Transplantation
 - Silicosis
 - End stage/Chronic renal failure/Hemodialysis
 - Carcinoma of the head and neck
 - Recent infection (<2 years)
 - Abnormal radiograph - fibronodular disease**AND**
Has no documentation of previous TB disease or previous significant reaction.

Admission Protocol

History and symptom inquiry as for pre-admission screening.

Follow-up of significant reactors with high risk medical conditions

- ▶ Individuals who have a significant TST should be referred for assessment to Tuberculosis Control, the Calgary or Capital Health TB clinic, even if they have normal chest radiographs.
- ▶ Continuing Care Centre charts on these individuals should be flagged for follow-up as appropriate (i.e. staff need to be alert to the development of symptoms, change in condition, possibility of need for annual review, etc.)

Ongoing Surveillance

Once initial screening is complete, residents will fall into 1 of the following categories, each of which is associated with recommendations.

1. Non-significant tuberculin reactor—no further follow-up unless the resident:
 - is in contact with active disease—follow-up as directed
 - develops symptoms suggestive of tuberculosis (see page 2-6)—send sputum for AFB and refer to family physician for follow-up
2. Significant tuberculin reactor—no further follow-up unless the resident:
 - develops respiratory symptoms—send sputum for AFB and refer to family physician for chest x-ray
 - has or develops an immunocompromising condition known to increase the risk of progression from infection to disease—refer to TB physician for assessment for preventive therapy
 - is in contact with an active case—investigate as appropriate
3. Those who have lung scars consistent with old healed tuberculosis on admission radiographs—follow-up as directed by TB Control or the Calgary or Capital Health TB Clinic.

Recommendations for Staff and Volunteer Screening

Pre-employment Screening

All staff working in healthcare facilities should be screened prior to employment through the occupational health program. This screening should consist of:

- ▶ history and symptom inquiry
- ▶ tuberculin skin test **unless** there is documentation of previous tuberculosis disease or significant reaction. A 2-step should be performed only if the area is designated as high risk, **or** the individual is from a TB endemic country, **or** has had BCG in the past **or** is 55 years or older.
 - If the result of the TST is non-significant—no further investigation is needed unless there is contact with a new infectious case.
 - If new significant reactors are identified, they require a complete TB assessment, including chest radiograph and sputum investigation. Refer either to the family physician, or to TB Control as appropriate.
 - Documented previous significant reactor—baseline chest radiograph report should be on file. If no radiograph has been done within 12 months of employment, one should be ordered through the Occupational Health Program.
- ▶ All volunteers should be screened for active disease with history and symptom inquiry. Those with symptoms consistent with tuberculosis should be referred to a physician for a TB assessment.
 - For most volunteers, the risk of acquiring nosocomial tuberculosis infection is no greater than for hospital visitors. Therefore, routine tuberculin skin testing at commencement is only required for those volunteers who will be volunteering in high risk facilities and who have direct patient contact.

Ongoing Surveillance

The following recommendations relate to ongoing surveillance for staff/volunteers according to their initial assessment criteria.

Non-significant reactors:

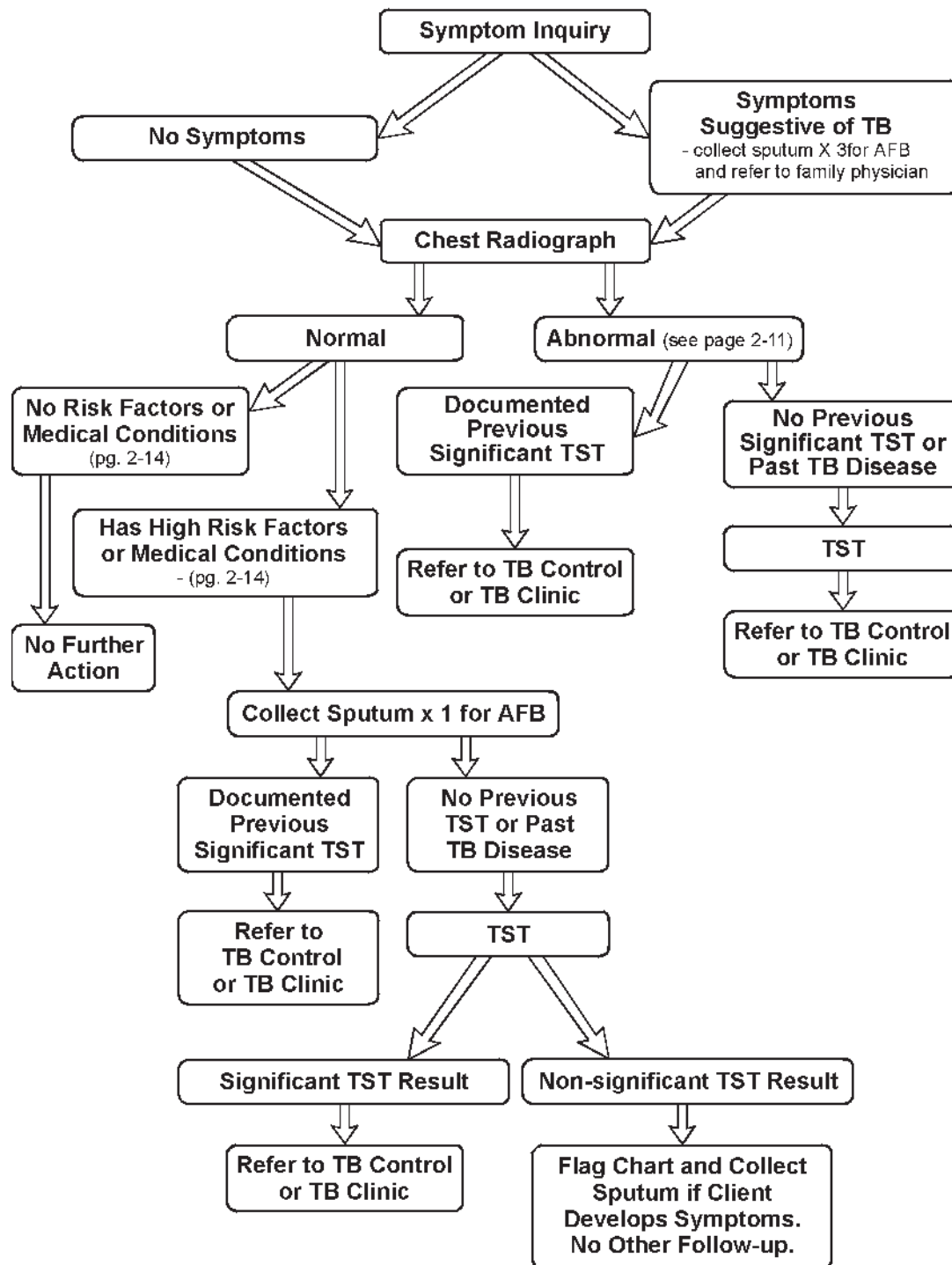
- ▶ repeat tuberculin skin testing according to risk of exposure to tuberculosis, or if the individual is in contact with a case of active TB

Significant reactors—repeat radiographs only if the individual:

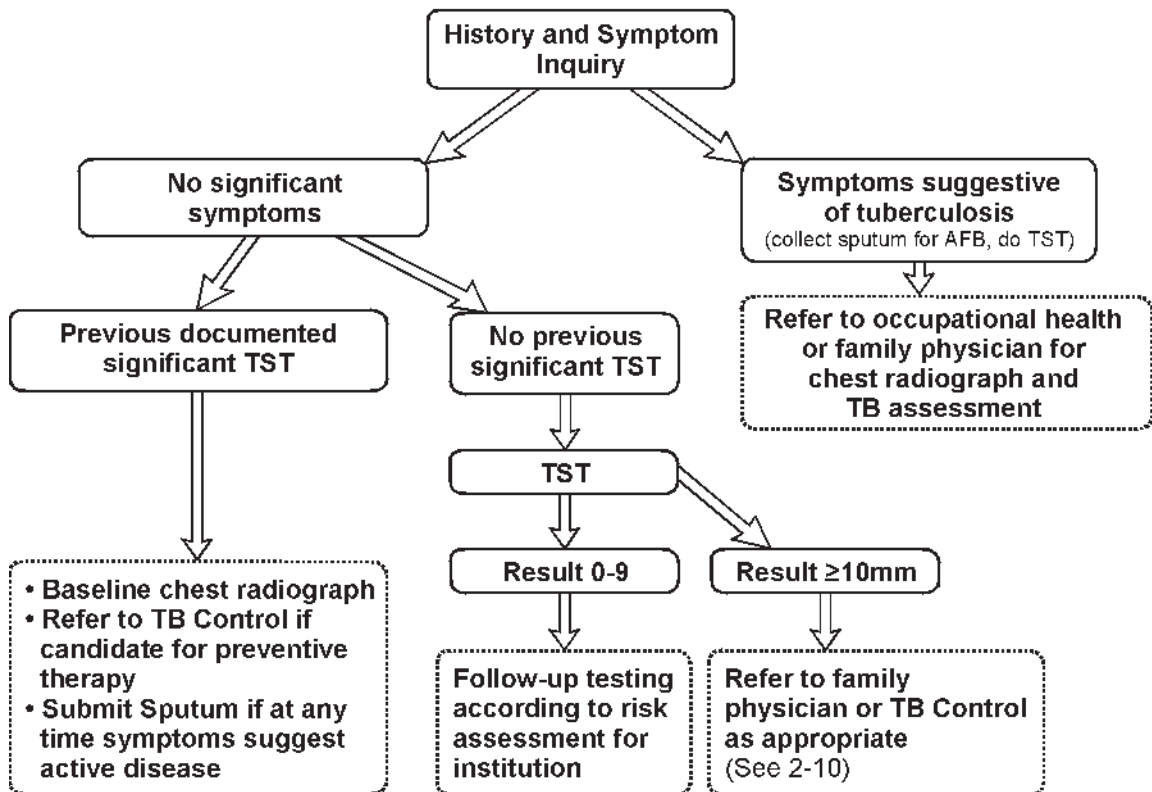
- ▶ is in contact with an individual with infectious tuberculosis
- ▶ develops symptoms of TB (also submit sputum for AFB and refer as appropriate)

See *“Guidelines for Preventing the Transmission of Tuberculosis in Health Care Facilities and Other Institutional Settings,”* pages 4-6.

Algorithm For Continuing Care Client Admissions Screening



Algorithm For Staff Screening



Screening Guidelines For Acute Care Facilities

The “*Guidelines for Preventing the Transmission of Tuberculosis in Health Care Facilities and Other Institutional Settings*” should be followed in the development of policies dealing with TB treatment and screening programs within the acute care facilities.

Think TB!

1. Admission history, for elective **or** emergency admissions, and particularly for persons from TB endemic countries, aboriginals and inner city residents, should specifically identify symptoms of tuberculosis, such as productive cough, weight loss, fever, night sweats, fatigue, or anorexia.

If symptoms are present, collect 3 sputum specimens for AFB smear and culture, ensure a chest-radiograph is performed, and assess tuberculin status.

2. Patients with symptoms or radiographic abnormalities that suggest active pulmonary TB should be isolated in the best available on-site room until sputum results are obtained.

All staff and visitors should be masked upon entry to the room, and sputum should be obtained for AFB smear and culture. Such isolation precautions should be maintained until the individual is determined to be non-infectious (smear- negative).

Confirmed smear-positive patients must be isolated in a room with proper engineering controls to prevent the spread of tuberculosis.

3. When tuberculosis is suspected, consultation with an expert in tuberculosis management is advisable.

Employee screening should be routine, and follow the same guidelines as continuing care staff.

Screening In Correctional Institutions and Substance Abuse Rehabilitation Centres

Residents and staff in correctional institutions and rehabilitation centres are at increased risk for exposure to tuberculosis.

They are more likely than the general population to be infected with tubercle bacilli and have risk factors that cause this infection to progress to TB disease. Environmental characteristics, such as shared air space, makes airborne transmission more likely.

Recommendations for Residents of Correctional Institutions and Rehabilitation Centres

Admission Screening

1. TB history to determine:
 - past exposure or treatment
 - previous history of tuberculin testing
2. Symptom inquiry to determine the possibility of current disease.
 - If the inmate or resident is symptomatic, collect sputum for AFB smear and culture.
 - Isolate the individual until sputum smear results are known.
3. Evaluate the individual's risk factors for HIV.
 - There is a very high risk that individuals who are both HIV and TB infected will develop active TB disease.
4. Tuberculin skin testing should be performed within 1 month of admission unless documentation of a previous significant test can be obtained.
 - 2-step TST (on admission only) should be considered when the policy of the institution is one of yearly skin testing.
 - Further investigation following admission screening will be in accordance with the algorithm on page 2-22.

Ongoing Surveillance

The federal and provincial correctional services have different programs for ongoing surveillance of both inmates and staff.

Federal programs promote annual testing for all inmates and staff.

- Annual TST is offered and recommended for all non-significant reactors.
- Annual symptom inquiry is required for all those whose skin tests were previously significant.

Provincial correctional facilities assess the tuberculosis status of inmates on admission. It is recommended that these facilities, and substance abuse rehabilitation centres adhere to the following guidelines for further assessment.

Non-significant tuberculin reactor—no further follow-up is needed unless the individual:

- has been in contact with an active case (contact investigation as per protocol); or
- develops respiratory symptoms suggestive of TB (collect sputum for AFB and arrange for chest radiograph to be performed)

Significant tuberculin reactor with normal radiograph—no further follow-up is needed unless the individual:

- is a candidate for preventive therapy (refer to Tuberculosis Control); or
- develops symptoms suggestive of disease activity (collect sputum for AFB and arrange for a chest radiograph); or
- has or develops an immunocompromising condition known to increase the risk of progression from infection to disease (see page 2-4 and refer to TB physician for assessment for preventive therapy)

Those who have lung scars on admission radiographs should be followed as directed by Tuberculosis Control or the Calgary or Capital Health TB Clinic.

Admission Screening for Short Stay Detoxification Centres

Individuals entering facilities that serve as short stay centres for the control of substance abuse, (< 3 months) should be screened to rule out active respiratory TB disease.

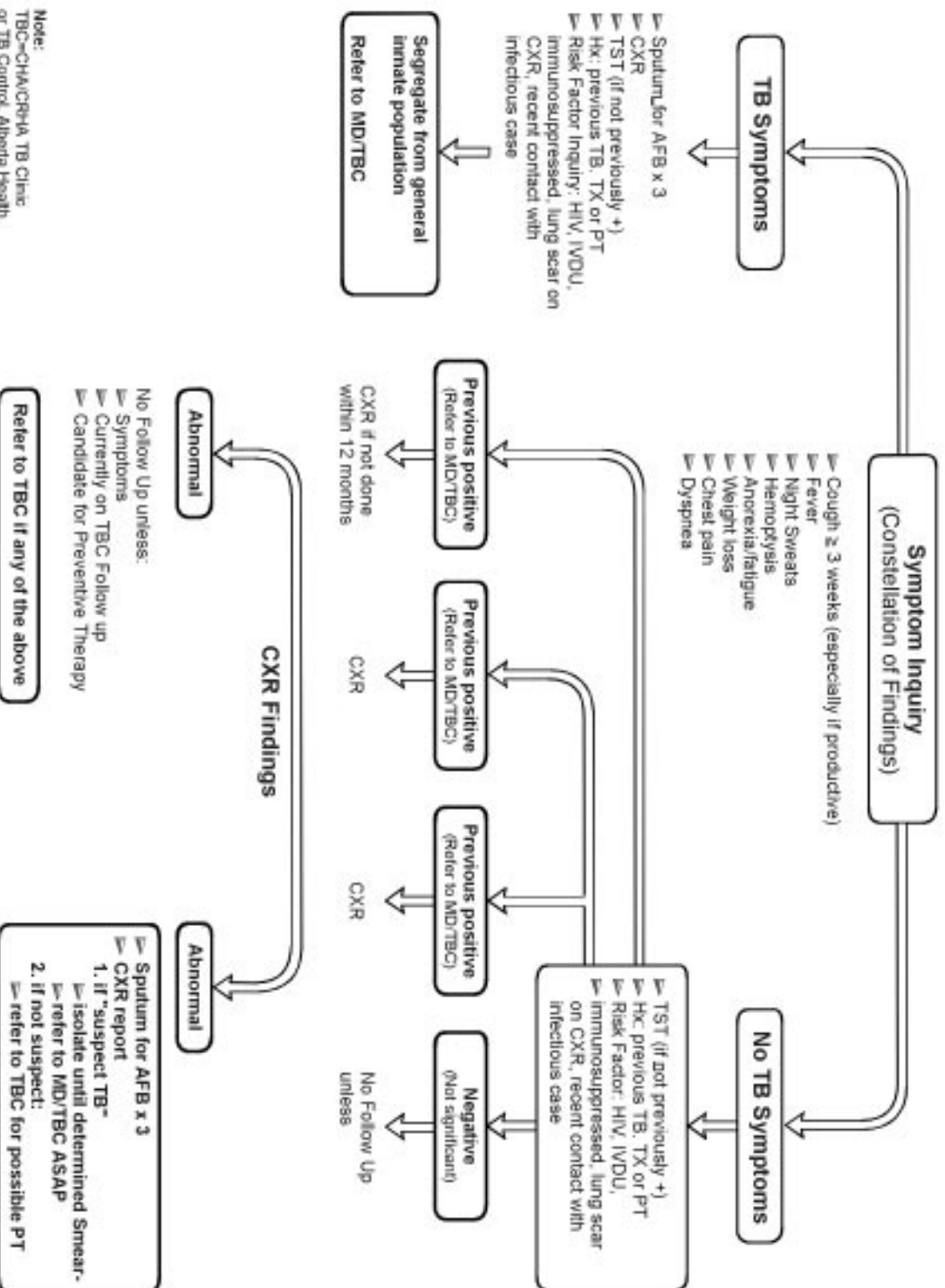
Rule out TB disease on admission.

All admissions should have, at minimum, a symptom inquiry completed. Collect sputum and refer to physician for assessment if symptomatic.

Employee Screening

Employee screening should be routine and at minimum, follow the same guidelines as for continuing care and acute care staff. Some programs, such as federal correctional facilities and AADAC rehabilitation centres encourage staff with non-significant reactions to be skin tested yearly.

Algorithm For TB Surveillance of New Admissions to Correctional Centres (September 2001)



Note:
TBC=CHA/CRHA TB Clinic
or TB Control, Alberta Health

Screening Guidelines for School Populations

Although routine TB screening of most school populations in Alberta is not indicated outside of on-reserve, First Nations communities, in some communities (i.e. those which continue to have higher TB infection rates than the norm) such screening may be warranted. Policies related to the need for a school testing program must be developed at the regional level, and should be based on local infection rate data.

Recommendations for Student Screening

Individual RHAs will direct the need for school screening, based on the incidence of disease in their own communities. It is strongly recommended that screening of the following populations receive high priority.

1. Recently arrived foreign-born students from tuberculosis endemic countries, entering the regular or post-secondary school system should be questioned about symptoms suggestive of tuberculosis, and referred as appropriate.

► Students who plan to remain in Canada for longer than 9 months may be screened with a TST and referred for preventive therapy as appropriate.

There is no universal requirement for these students to present themselves for TB screening, which makes this population difficult to access. Educational institutions and schools should be encouraged to communicate with local Public Health offices regarding new students so that appropriate screening can be undertaken.

Foreign-born students represent a special challenge, as many do not have Canadian health care coverage. In this circumstance, the RHA in which they reside will be responsible for any costs associated with this screening (e.g. chest radiograph).

2. Children living in First Nations communities in Alberta. The First Nations and Inuit Health Branch of Health Canada, recommends routine screening of children attending school on reserve in Grade 1 and Grade 6. Children who live in First Nations communities and attend schools off reserve, may not be included in this school screening process.

Follow-up of Significant TST in School Children

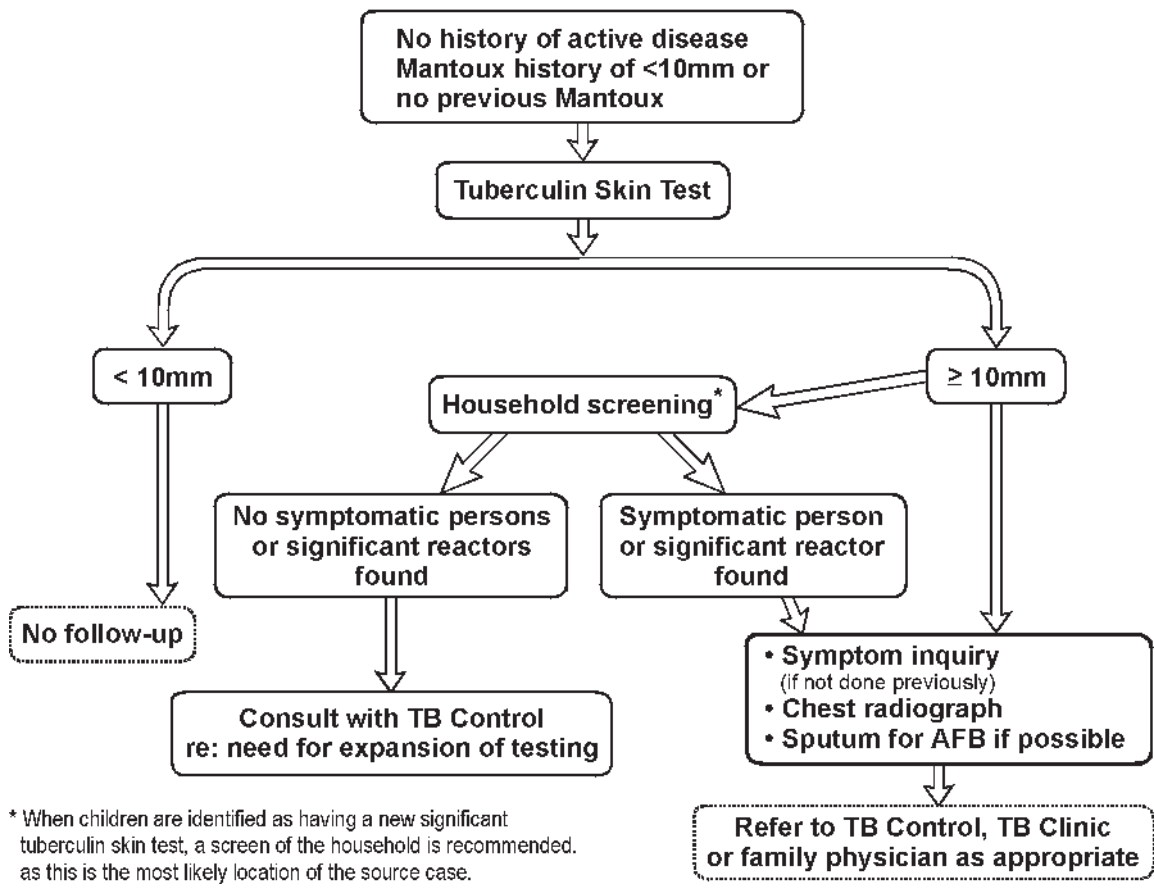
A significant tuberculin skin test reaction in children and adolescents usually indicates *recent* infection. When those with newly identified significant reactions are found, a screen of the household is recommended, as this is the most likely location of the infecting source case. This is known as a *source case investigation* (finding the undiagnosed infectious case).

Decisions about who should be screened are based on the same criteria as for contact investigations, as identified in the concentric circle of contact investigation (see page 4-15).

- ▶ If no household cases are found, the search may need to be expanded.
- ▶ Investigate the BCG history— when was it given, were repeated vaccinations given, is documentation of vaccination available?
 - Children who were BCG vaccinated in the first year of life should be tuberculin negative after age 2 or 3 (and possibly before this). A significant reaction after this age should always be interpreted to mean that the child is infected.
 - The possibility of BCG being the cause of a significant reaction increases if BCG was given after the first year of life.
- ▶ Inquire about any symptoms.
- ▶ Refer to Tuberculosis Control or the Capital Health or Calgary TB Clinic.
- ▶ Arrange for radiograph if appropriate (regions outside Calgary and Capital Health).

When children are identified as having TB infection, a search for the source of the infection is undertaken.

Algorithm for Routine Tuberculosis Screening of School Aged Children



Screening of HIV Infected Individuals

Tuberculosis may be a sentinel disease in the HIV infected. Although pulmonary TB may be regarded as an opportunistic infection in the HIV infected, it remains a serious public health concern for the general population as well as for other HIV infected individuals.

Because their immune systems are compromised, HIV infected individuals who are co-infected with the tubercle bacillus, have a much higher likelihood of developing TB disease than those who are not HIV infected.

Nonrespiratory disease and atypical presentations of disease are seen more frequently than in non-HIV infected populations.

During initial screening by physicians, all individuals who have a positive HIV test should be investigated for the presence of tuberculous infection and/or the possibility of active tuberculosis.

All individuals who are diagnosed with active TB should be tested for HIV co-infection, and all individuals with HIV infection should be screened for TB co-infection.

Screening Recommendations for HIV Infected Clients

- ▶ history and symptom inquiry
- ▶ physical exam
- ▶ chest radiograph
- ▶ sputum examination or other diagnostic tests if active TB is suspected
- ▶ tuberculin skin testing:
 - ≥ 5 mm reaction is considered **significant** in this population, and warrants immediate referral to Tuberculosis Control or one of the TB Clinics if not previously referred. Once active disease has been ruled out, preventive therapy is strongly recommended.
 - HIV positive individuals without current active TB who have **non-significant** tuberculin tests, but who are members of high-risk groups for infection with TB represent a challenging group.
 - Information should be gathered about remote past significant skin tests. An HIV infected individual whose **previous** TST was significant, but whose **present** test is non-significant, is most likely very immunocompromised and therefore at high risk of developing disease.
 - Ongoing screening for new infection or active disease needs to be initiated and maintained.
 - Those who have been in close contact with a case of infectious TB need to be placed on preventive therapy regardless of the TST result.

Recommendations for Staff and Volunteers

Volunteers and staff in HIV clinics should be screened as recommended for acute care and continuing care staff.

Screening Guidelines For Foreign-Born Populations

Emigrants from countries with a high prevalence of tuberculosis are often infected with the tubercle bacillus. Even those with no evidence of active TB at the time of their emigration remain at high risk of developing tuberculosis. Approximately 60% of cases of TB in Alberta occur in the foreign-born.

Compared to tuberculosis in Canadian-born individuals, tuberculosis in the foreign-born is more likely to be drug-resistant and non-respiratory.

Immigration Surveillance

In accordance with the revised national guidelines for the investigation and follow-up of individuals who were placed under surveillance for tuberculosis after arrival in Canada, all immigration applicants, refugees, and certain visitors entering Canada are required to undergo an immigration medical examination. This is meant to identify those applicants who may pose a risk to public health, a risk to public safety or may place excessive demands on Canadian health and social services.

Immigration requires certain individuals to undergo a medical examination when they apply to move to, or stay in, Canada. Ottawa notifies provincial Tuberculosis Control of these individuals:

- ▶ those intending to work in an occupation where protection of public health is essential (e.g. teachers, nannies)
- ▶ visitors who have lived in a **designated country** for 6 or more consecutive months in the year preceding the date of seeking entry to Canada, and who are intending to stay in Canada for at least 6 months.
- ▶ applicants for landed immigrant status

Health Canada determines whether a country is *designated* based on TB figures from the World Health Organization.

Those who have a history of tuberculosis and those who have evidence of past disease on their chest radiographs are required to undergo medical surveillance after their arrival in Canada. This surveillance ensures that they do not currently have active TB disease, that any prior treatment was adequate, and that any need for preventive therapy is identified.

- ▶ These individuals may need to be seen, usually at the TB Clinic in either Edmonton or Calgary for an in-depth history, physical exam, and appropriate diagnostic tests.
- ▶ The immigrant will receive a letter from Tuberculosis Control or one of the TB Clinics regarding the need for assessment. A copy of the letter will be forwarded to the RHA in which the person resides, along with direction for any follow-up needed at the regional level. Public Health staff may need to assist with booking appointments.

After review by the TB Physician, one of the following decisions will be made.

1. Investigate further for active disease and treat if disease is found. Initial treatment for immigrants with active disease includes at least 4 drugs because of the possibility of drug resistance.
2. Offer preventive therapy, once active disease is excluded. It is mandatory to obtain sputum specimens before offering preventive therapy in such cases.
3. Follow for up to 3 to 5 years if preventive therapy is refused yet the immigrant is at high risk of disease, or if previous treatment was inadequate.

Surveillance of Individuals Who Did Not Undergo Immigration Screening

Visitors, short-term students, those with temporary working visas, and those intending to, but not yet having applied for refugee status, will not normally be part of this pre-immigration screening process. As Tuberculosis Control will seldom receive notification that they have come to Canada, no recommendations for follow-up can be made.

It is important that **all** health professionals seeing newcomers in these categories, particularly those from high prevalence countries, maintain a high index of suspicion for TB and investigate thoroughly by:

- ▶ inquiring about symptoms, and if disease activity is suspected, collecting sputum specimens and referring to a physician for chest radiographs or other appropriate investigations
- ▶ inquiring about past history of tuberculosis disease and/or treatments
- ▶ arranging for tuberculin skin testing for healthy individuals who may be good candidates for preventive therapy and *who plan to remain in the country for at least 9 months* so they can complete a full course of preventive therapy (if indicated).
- ▶ evaluating individuals with newly or previously significant TSTs, including a chest radiograph and sputum culture
- ▶ referring individuals as appropriate to TB Control or the Capital Health or Calgary TB Clinic for consideration of preventive therapy once active disease is ruled out