



Identifying **Missed** Opportunities For Preventing TB

A Resource For TB Programs



New Jersey
Medical School
**National
Tuberculosis
Center**

A Founding Component of the International Center for Public Health



Identifying Missed Opportunities For Preventing TB

A Resource For TB Programs



New Jersey
Medical School
**National
Tuberculosis
Center**

A Founding Component of the International Center for Public Health

Acknowledgements

The New Jersey Medical School National Tuberculosis Center wishes to thank the following individuals for their consultation and support of this project:

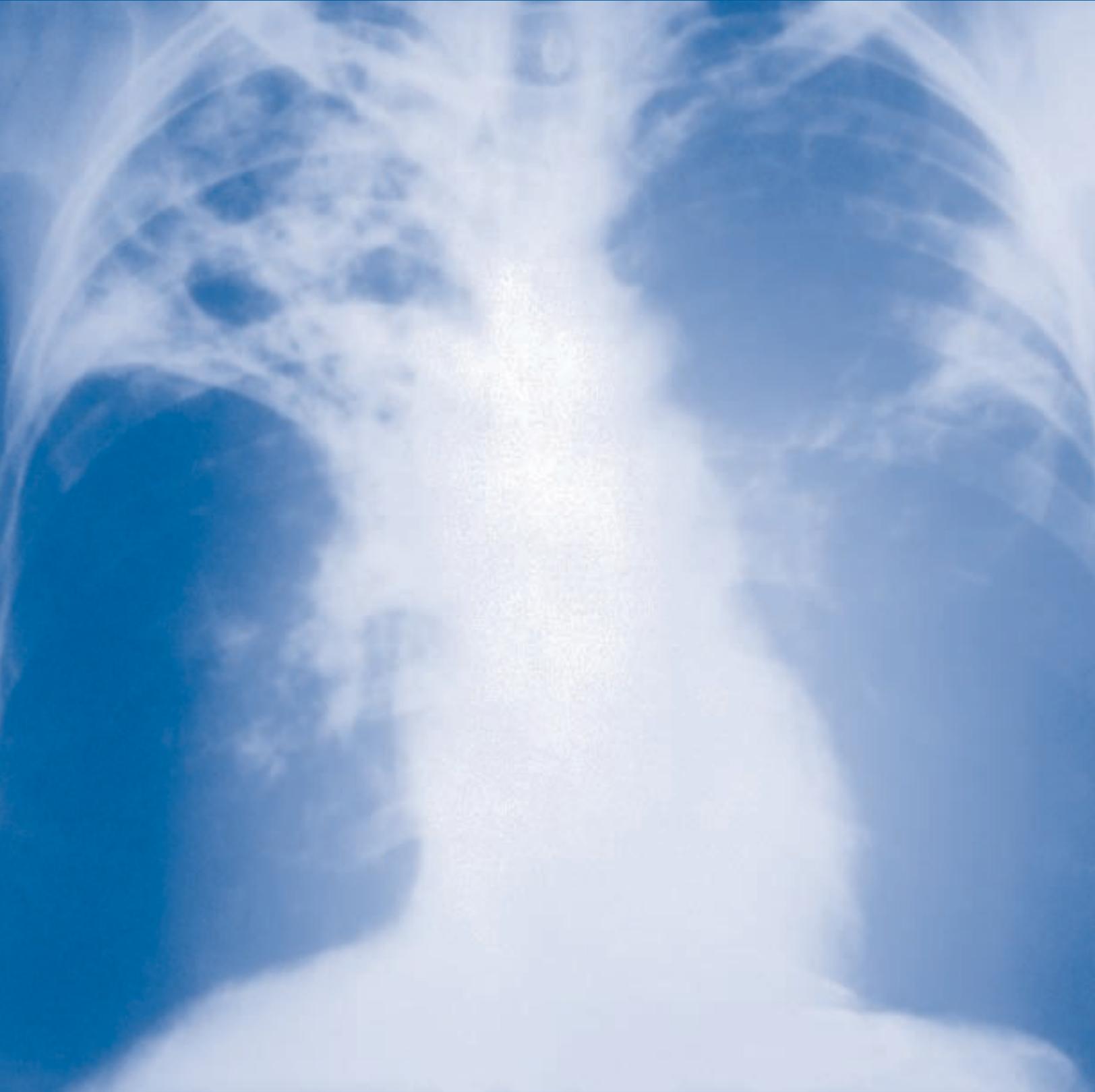
- John Bernardo, M.D.
- Claire Murphy, R.N., M.S.N.
Boston Public Health Commission
- Naomi Bock, M.D.
Centers for Disease Control and Prevention
- Paul Colson, Ph.D.
- Bill Bower, M.P.H.
Charles P. Felton National Tuberculosis Center
- Andrea Green-Rush, M.L.I.S.
Francis J. Curry National Tuberculosis Center
- Mike Holcombe, M.P.P.A.
Mississippi State Department of Health
- Kathleen Moser, M.D.
San Diego Health and Human Services Agency
- Masae Kawamura, M.D.
San Francisco Department of Health
- Carol Pozsik, R.N., M.P.H.
South Carolina Department of Health
- Jimmy Keller, M.A.
Ohio Department of Health
- Rajita Bhavaraju, M.P.H., C.H.E.S.
- Lorna Cunningham, R.N.
- Marie Derisse, R.N.
- Debra Kantor, Ph.D.
- Bonita Mangura, M.D.
- Eileen Napolitano
- Alfred Paspé
- Lillian Pirog, R.N., P.N.P.
- Judy Thomas, R.N.
- Suzanne Tortoriello, R.N., P.N.P.
- Dianne Washington, R.N.
New Jersey Medical School
National Tuberculosis Center
- Document prepared by: Chris Hayden
- Graphic Design: Karen Forgash

All material in this document is in the public domain and may be used and reprinted without special permission; citation as to source, however, is appreciated. Suggested citation: New Jersey Medical School National Tuberculosis Center. Identifying Missed Opportunities for Preventing TB: A Resource for TB Programs. 2003: (inclusive pages).

This document may be accessed in PDF format from the New Jersey Medical School National Tuberculosis Center's website: <http://www.umdnj.edu/ntbcweb> From within the PDF format, users can link to files for each of the forms and images for downloading, copying, or modification to meet local needs.

Table of Contents

Acknowledgements	.2
Introduction: Why this product was developed	.5
Background: How this product was developed and initial results	.7
Guidelines for Completing the Form	.8
Displaying Data for Analysis	.11
Translating Data into Action	.12
Prior History Intake for TB Cases and Suspects (Form)	.14
Appendix 1 – Poster Abstract with Initial Results	.16
Appendix 2a – List of Health Care Facilities By Facility Name	.17
Appendix 2b – List of Health Care Facilities By Type Facility and Facility Name	.18
Appendix 2c – List of Health Care Facilities By Street Name	.19
Appendix 3 – Getting a Tuberculin Skin Test	.20
Appendix 4 – Tuberculin Skin Test Reading (Positive)	.21
Appendix 5 – Normal Chest X-Ray	.22
Appendix 6 – Drugs to Prevent Active TB Disease	.23
Appendix 7 – Drugs to Treat Active TB Disease	.23
Appendix 8 – Prior History Intake Form for TB Cases and Suspects-Feedback	.24
Appendix 9 – Missed Opportunities Summary Form	.25
Appendix 10 – Missed Opportunities Summary Form (Consecutive Patients)	.26
Appendix 11 – Missed Opprtunities Summary Form (By Health Care Provider)	.28



Introduction:

Why this product was developed

Targeted tuberculin testing for latent tuberculosis infection (LTBI) has been identified as a strategic component of TB control and identifies persons at high risk for developing active TB who would benefit from treatment of LTBI [1]. TB control programs which are successful in achieving national objectives for treating active TB and carrying out contact investigations should introduce or strengthen well-planned targeted testing and treatment of LTBI activities.

The **first step** in developing a targeted TB testing and treatment of LTBI program is to conduct an **epidemiological analysis of reported TB cases** in a given geographic area. Using Report of Verified Case of Tuberculosis (RVCT) data, trends (over time) in the magnitude (number of cases) and distribution (e.g., by demographic, TB risk factors, and geographic variables) should be routinely performed to create a profile of cases in the community. For example, analyses may reveal an increase in cases with HIV infection and a history of substance abuse in one community and an increase among recently arrived foreign-born persons in another. Data on the characteristics of cases can help suggest the types of facilities in the community where targeted testing efforts might be strengthened, e.g., HIV care centers, drug treatment programs, and community health centers.

However, RVCT data only indicate the presence of many risk factors (e.g., substance abuse, homelessness, and incarceration) during the year prior to diagnosis. Most cases of active TB occur among persons with risk factors who have harbored latent TB infection (LTBI) for years prior to developing disease. Many of these persons have had multiple encounters with medical care providers during years prior to diagnosis when TB testing and treatment of LTBI could have been carried out. Missed opportunities to prevent TB often occur because of a failure to:

- Perform a tuberculin skin test (TST) when a TB risk factor is present
- Prescribe treatment when LTBI is identified
- Ensure completion once treatment is started.

Consistent with published recommendations [1,2], programs intent on accelerating progress towards TB elimination will need to:

- Identify specific providers serving persons with TB risk factors prevalent in the community
- Strengthen targeted testing and treatment of LTBI programs among these providers through a variety of activities such as planning, training, consultation, evaluation, and referral services

1. *Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection (Am J Respir Crit Care Med Vol 161. pp S221-S247, 2000)*

2. *Ending Neglect: The Elimination of Tuberculosis in the United States, a Report by the Institute of Medicine (National Academy Press 2000).*

The **purpose of this product** is to provide health departments with a tool to document the extent to which their TB cases could have been prevented and to specifically identify:

- Providers who served the patient prior to the TB diagnosis
- Points at which the provider failed to carry out TB testing and treatment recommendations

This should serve as a valuable supplement to the community TB profile developed through epidemiological analyses of RVCT data. Further armed with information about specific missed opportunities, TB programs will be in a much stronger position to convince facility managers about the value and need for strengthening TB testing and treatment of LTBI activities among the high risk populations they serve.

When this product is used in conjunction with data from a **companion product*** being developed by The New Jersey Medical School (NJMS) National TB Center (*A Template for Prioritizing Health Care Facilities for Targeted TB Testing and Treatment of LTBI*), health departments should be able to make a compelling case for strengthening activities in specific target facilities. Once a facility has agreed to collaborate, health departments can use a **third product*** being developed by the NJMS National TB Center to plan and implement a specific program. This product will include tools for conducting a detailed needs assessment, for assigning facility and TB program responsibilities, and for data collection and evaluation.

**Products scheduled for completion in 2003 and will be available on the NJMS NTBC website.*

Note: *This product does not seek to identify patients' health-seeking behavior which might help explain why they did not seek care earlier (when symptoms first developed) and whether or not they would have participated in testing and treatment services if they had been offered. To do so would have required lengthening the intake form considerably. Nevertheless, these patient-centered issues should be recognized and accommodated in designing targeted testing and treatment programs in specific facilities. Based on focus groups among candidates for LTBI treatment in various risk groups, the NJMS National TB Center is developing culturally and linguistically-appropriate educational materials which will specifically address barriers to participating in LTBI activities. As they are completed, these materials will be posted on the NJMS National TB Center website (<http://www.umdnj.edu/ntbcweb>) and the CDC National Prevention Information Network website (<http://www.cdcnpin.org/tb/pubs/tbguide.htm>).*

Background:

How this product was developed and initial results

In April 2000, the NJMS National TB Center in Newark designed a Prior History Intake Form for TB Cases and Suspects* in order to consistently elicit information about:

- TB risk factors
- Pre-TB diagnosis encounters with health care providers and other settings where TB testing and treatment could have been carried out

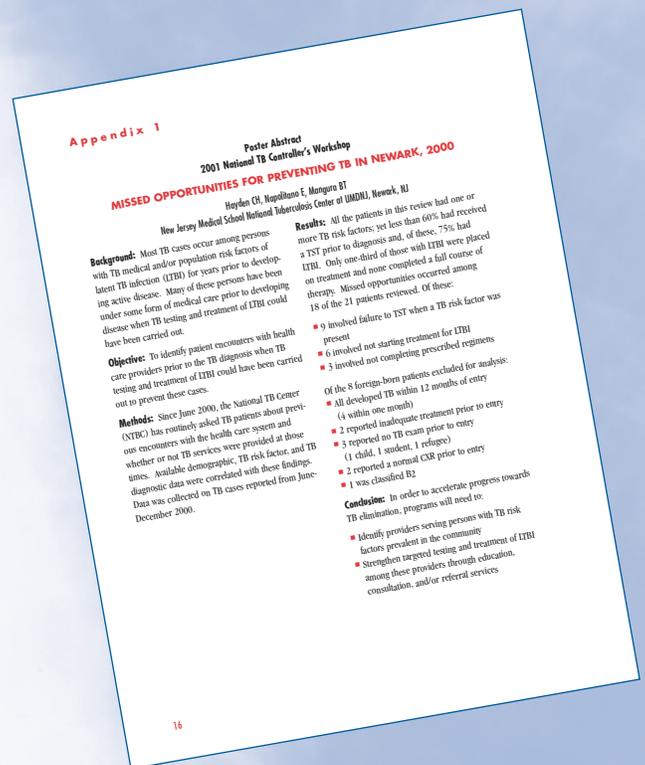
During field testing (May 2000), Nurse Case Managers (NCMs) began routinely completing the form during the initial intake interview process. Feedback was obtained by reviewing forms for completeness, reviewing forms for consistency with other information in the medical record, and frequent meetings with the NCMs.

The Intake Form was revised based on feedback, and the NCMs began using it in July 2000. The results of analyzing data on patients with TB diagnosed during July-December 2000 were presented at the 2001 National TB Controllers Workshop (Appendix 1).

In October 2001 a draft of the product was sent to 10 TB programs for review, testing, and comment. Feedback was received from 7 areas and was used in finalizing the product.

This information will be used in conjunction with the results from the **Template for Prioritizing Health Care Facilities for Targeted TB Testing and Treatment of LTBI** in approaching specific facilities for collaboratively developing strengthened activities.

**Note: As described in this product, the purpose of the data from this form is to help guide program planning. Therefore, Institutional Review Board (IRB) approval should not be necessary. However, if a program wishes to publish its findings, local IRB approval should be sought.*



Guidelines for Completing the Form

Purpose of form: To supplement epidemiological analyses of RVCT data by identifying missed opportunities by specific providers for TB testing and treatment during the several years **prior to** the patient's current illness.

Overall Responsibility: Assign a single individual in the TB program to have overall responsibility for the following activities. This person could be the program manager, nurse consultant, epidemiologist, or some other individual who understands and is interested in this activity:

- Planning implementation
- Conducting an inservice on completing the form
- Reviewing completed forms for accuracy and completeness
- Providing consultation to persons who complete the forms
- Compiling and analyzing data from the forms
- Making recommendations based on results

Who should complete the form?

- The staff member assigned to manage the case/suspect (“*case manager*”) who performs the initial intake interview
- Preferably, the interviewer should be familiar with the patient's language and culture

Prior History Intake for TB Cases and Suspects
page 1 of 2

Patient's Name _____ RVCT # _____
Date Initial Interview ____/____/____ Interviewer's Name _____
Date Re-Interview ____/____/____ Interviewer's Name _____

1. Date onset of current TB illness: ____/____/____ (Note: Dates for all subsequent questions should precede this date.)
Date based on: Symptoms onset Other (____)

2. Country of origin: _____ Date entered U.S. ____/____/____ If origin outside U.S.:
 ■ Was status on entry: Immigrant Tourist/Visitor Asylee Student Work
 Refugee Fiancée/Child Undocumented Unknown
 ■ Did you receive a chest x-ray before you entered the U.S.? (Appendix 3) Yes No Unknown If yes:
 * Date: ____/____/____ * Results: Normal Abnormal TB Abnormal Other _____
 If Abnormal for TB:
 ■ TB Classification: A B1 B2 Unknown
 ■ Did you receive any TB drugs before you entered the U.S.? (Appendix 3) Yes No Unknown
 If yes: Name(s) of drugs: _____ * # of months taken: _____

3. If born in the U.S. or since arriving in the U.S. (if foreign born):
 Have you ever spent 1 month or longer in another country? Yes No Unknown If yes:
 ■ What country? _____ ■ Dates of stay: From ____/____/____ To ____/____/____
 ■ Reason: Vacation School Business Military Visit Family Other (____)

Before onset of current TB illness, when did you last have?	Est. Date	Name of Doctor or Facility	Reason for Test	Test Results
4. A tuberculin skin test? (Appendix 3, 4, 5)				<input type="checkbox"/> Pos <input type="checkbox"/> Neg <input type="checkbox"/> Ind <input type="checkbox"/> Sent for CR
5. A Chest X-Ray? (Appendix 3)				<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal

Before onset of current TB illness, were you ever:	YES/NO/ or Unknown	Est. Date	Name of Doctor or Facility	Drugs Taken
6. Other medication to prevent active TB?				Name (Appendix 4) / # mo / Why stopped?
7. Diagnosed with Active TB disease?				

* The Health Care Quality Unit (Appendix 2) is needed.

14

When should the form be completed?

- Complete as much of the form as possible during the initial intake interview
- Since the initial visit may be lengthy, tedious, and confusing for the patient, the case manager may find it necessary to obtain some of the information during a subsequent visit when the:
 - ✓ Patient feels more relaxed
 - ✓ Manager has established a rapport with the patient
 - ✓ Patient has a better understanding of TB
- Try to obtain all the information within one month

Placement of Form: Staff responsible for initially assembling the medical record should place the form in a visible location **where it can be readily accessed** (e.g., on top of the Progress Notes) so the case manager will be prompted to complete the form during the initial intake.

How long does it take to complete the form?:

- Based on experience, it should take about 25 minutes to complete each form
- Interviews tend to take longer when an interpreter is used

Before asking questions on the form, first explain to the patient:

- The difference between TB infection and disease
- He/she may have been infected with LTBI years ago
- If his/her infection had been detected earlier, medication could have been taken, which would probably have prevented this disease
- The information provided will help identify times in the past when his/her doctor or nurse could have found dormant (*sleeping*) TB by testing with a tuberculin skin test and then might have offered a chance to prevent his/her TB by taking medicine
- The information given by the patient is confidential and will not be shared

Review the Medical Record First

In order to save time and to confirm information previously obtained about the patient

■ Prior to the interview:

- ✓ Review other available sections of the medical record (e.g., the hospital admission history, the clinic progress notes or the RVCT)
- ✓ Record (in pencil) information on the Intake Form where appropriate

■ During interview, confirm previously obtained information or make corrections if necessary

Dates:

- Patients are not likely to recall the exact dates of previous encounters with various doctors or health care facilities (e.g., for diagnoses, treatments, or examinations)
- If the exact date is not known, try to elicit (in order of preference):

- ✓ Month and year of the event
- ✓ Year of the event
- ✓ Number of years since the event

■ Prompt patient by asking if the event occurred around:

- ✓ Recurring events of the year, e.g.:
 - Seasons
 - Birthdays
 - Holidays
 - Anniversaries
- ✓ Important single life events, e.g.:
 - Entering the US
 - Starting or ending a job
 - Marriage
 - Birth of a child
 - Military duty
 - Incarceration

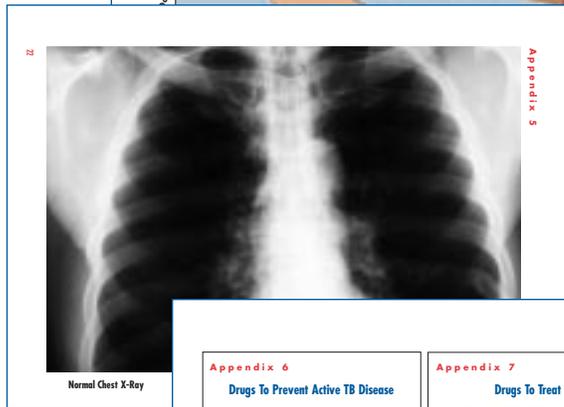
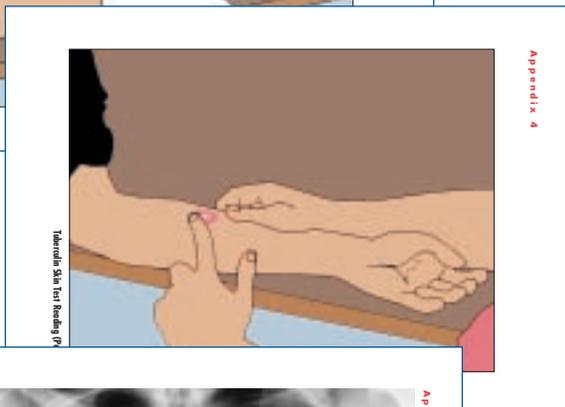
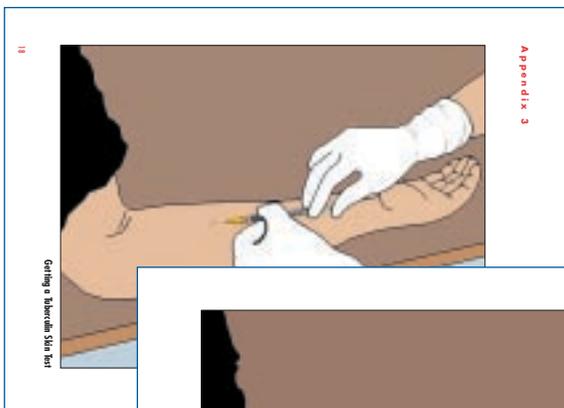
Name of the doctor, clinic, hospital, or other health care facility:

- Make every attempt to identify the specific name of the doctor/facility which examined, treated, or housed the patient, such that you could contact that doctor/facility if need be
- Consider developing an Excel® (or other electronic) spread sheet (See Appendix 2) of health care facilities and other providers in the community which serve patients at high risk for TB. By using the sort feature of the spread sheet software, different versions of the list can be generated (e.g., by type of facility, by name of facility, or by street name)

These lists can help the patient recall the name and location of the health care provider/facility. For example, patients often know the name of the street or the street address, but not the actual name of the facility.

The image shows three overlapping spreadsheets titled "Health Care Facilities By Facility Name", "Health Care Facilities By Street Name", and "Health Care Facilities By Type Facility and Facility Name". Each spreadsheet has columns for Type Facility, Facility Name, AKA, Street #, Street Name, and City. The "By Type Facility and Facility Name" spreadsheet is the largest and most detailed, listing various facilities like hospitals, clinics, and jails across different cities such as Consumption, Upper Tuberville, and South Scitola.

Using pictures to clarify questions: Patients may give more accurate responses about tests and treatment if given visual prompts while asking selected questions, for example:



Prior History Intake for TB Cases and Suspects
page 1 of 2

Patient's Name _____ INT # _____
Date Initial Interview ____/____/____ Interviewer's Name _____
Date Re-Interview ____/____/____ Interviewer's Name _____

1. Date onset of current TB illness: ____/____/____ (Note: Dates for all subsequent questions should precede this date).
Date based on: Symptoms onset Other (_____)

2. Country of origin: _____ Date entered U.S. ____/____/____ if origin outside U.S.:
 Visa status on entry: Immigrant Tourist/Visitor Asylee Student Work
 Refugee Fiancée/child Undocumented Unknown
 Did you receive a chest x-ray before you entered the U.S.? (Appendix 5) Yes No Unknown **If yes:**
 Date: ____/____/____ Result: Normal Abnormal TB Abnormal Other _____

If Abnormal for TB:
 TB Classification: A B1 B2 Unknown
 Did you receive any TB drugs before you entered the U.S.? (Appendix 5) Yes No Unknown
If yes: Name(s) of drug: _____ # of months taken: _____

3. **If born in the U.S. or since arriving in the U.S. (if foreign born):**
 Have you ever spent 1 month or longer in another country? Yes No Unknown **If yes:**
 What country: _____ Dates of stay: From: ____/____/____ To: ____/____/____
 Reason: Vacation School Business Military Visit Family Other (_____)

Before onset of current TB illness, when did you last have:	Est. Date	Name of Doctor or Facility	Reason for Test	Test Results
4. A Tuberculin Skin Test (Appendix 3 & 4)				<input type="checkbox"/> Pos. <input type="checkbox"/> Neg. <input type="checkbox"/> Unk. <input type="checkbox"/> Seen for CXR
5. A Chest X-Ray (Appendix 5)				<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal

Before onset of current TB illness, were you ever:	YES/NO/ or Unknown	Est. Date	Name of Doctor or Facility that Treated You*	Drug Taken	Name (include U.S.)	Dose	Why Stopped?
6. Offered medicine to prevent active TB							
7. Diagnosed with active TB disease							

* In Health Care Facility List (Appendix 2) if needed

Question 4:

- Show a picture of a TST being administered (Appendix 3). Explain that the test results in a small raised bump on the arm and that it is necessary to return in 2-3 days for the reading.
- Show a picture of a positive TST being read (Appendix 4)

Question 5:

- Show a picture of a chest radiograph (Appendix 5)

Question 6:

- Show patient a picture of an INH tablet and a B6 tablet (Appendix 6)
- Make sure patient understands this is treatment for latent TB infection (i.e., a positive TST) and not treatment for active TB disease

Question 7:

- Show patient a picture of tablets of INH, RIF, EMB, and PZA. (Appendix 7)

Sensitive Questions:

Patients may be reluctant to forthrightly answer sensitive questions (e.g., questions 13, 14, 15, 18, 19, 27, 28, and 29) on the initial interview. If so:

- Highlight unanswered questions or questions the patient seemed reluctant to answer
- Reassure the patient that the information provided is confidential and will not be shared
- Re-ask these questions during subsequent visits after establishing rapport with the patient

Interviewer's Assessment

- After the interview, review the responses to the questions
- Indicate on the form whether or not the case was potentially preventable.
- Explain why or why not (based on which questions)

Translating Data into Action

By completing the Prior History Intake form and completing the Missed Opportunities for Preventing TB Summary Form, users will have a list of providers who served patients prior to their TB diagnoses and the points at which the providers failed to carry out TB testing and treatment recommendations.

Armed with information about specific missed opportunities, TB programs will be in a much stronger position to convince managers in individual facilities that their TB testing and treatment of LTBI activities need to be given higher priority and strengthened. Looking at the data from the Summary Form ([Appendix 11](#)), the TB program may want to approach each of the following:

- **Health Department A** which failed to convince 2 contacts to take treatment for LTBI and failed to identify 3 contacts
- **Jail A** which failed to do a TST on one inmate and failed to ensure completion of treatment for LTBI on 2 inmates
- **Jail B** which failed to perform a TST on one inmate and failed to offer treatment for one inmate with LTBI
- **HIV Facility A** which failed to prescribe treatment for LTBI for the recommended length of time
- **Hospital B Medical Clinic** which did not perform a TST on 2 patients with TB risk factors
- Private medical doctor (**PMD A**) who failed to perform a TST on 3 patients from an endemic country (*Haiti*)
- **Drug Treatment Facilities A and C** which failed to perform a TST on clients with a history of injection drug use
- **Drug Treatment Facility B** which failed to place a client with a positive TST and a history of non-injection drug use on treatment for LTBI.

As noted in the [Introduction](#), the NJMS National TB Center is developing other products which will assist TB programs in prioritizing health care facilities where targeted TB testing and treatment of LTBI should be strengthened and in planning and implementing programs in a specific facilities.

As types of provider facilities which missed opportunities are identified, TB programs may also want to review and help strengthen the TB-related regulations, accreditation standards, grant-recipient activities, policies, and procedures which influence the clinical practice in these settings. In New Jersey, for example, the State TB Program has collaborated with the State Division of Addiction Services in updating the *TB Surveillance Procedures for Substance Abuse Treatment Centers* which will include more explicit requirements for TB testing among clients, as well as follow up evaluation and treatment of clients with LTBI.



Identifying Missed Opportunities For Preventing TB Forms and Appendices

These forms and appendices may be accessed in PDF format from the New Jersey Medical School National

Tuberculosis Center's website:

<http://www.umdnj.edu/ntbcweb>

From within the PDF format, users can link to files for each of the forms and images for downloading, copying, or modification to meet local needs.

Prior History Intake for TB Cases and Suspects

page 1 of 2

Patient's Name _____ RVCT # _____

Date Initial Interview ___/___/___ Interviewer's Name _____

Date Re-Interview ___/___/___ Interviewer's Name _____

1. Date onset of current TB illness: ___/___/___ **[Note: Dates for all subsequent questions should precede this date].**
 Date based on: Symptoms onset Other (_____)

2. Country of origin _____ Date entered U.S. ___/___/___ If origin outside U.S.:
- Visa status on entry: Immigrant Tourist/Visitor Asylee Student Work
 Refugee Fiancée/child Undocumented Unknown
 - Did you receive a chest x-ray before you entered the U.S.? (*Appendix 5*) Yes No Unknown **If yes:**
 - Date: ___/___/___
 - Results: Normal Abnormal TB Abnormal Other

If Abnormal for TB:

- TB Classification: A B1 B2 Unknown
 - Did you receive any TB drugs before you entered the U.S.? (*Appendix 7*) Yes No Unknown
- If yes:** Name(s) of drugs _____ ▪ # of months taken _____

3. *If born in the U.S. or since arriving in the U.S. (if foreign born):*
- Have you ever spent 1 month or longer in another country? Yes No Unknown _____ **If yes:**
- What country? _____
 - Dates of stay: From: ___/___/___ To: ___/___/___
 - Reason: Vacation School Business Military Visit Family Other (_____)

Before onset of current TB illness, when did you last have	Never	Est. Date	Name of Doctor or Facility*	Reason for Test	Test Results
4. A Tuberculin Skin Test? (<i>Appendix 3 & 4</i>)					<input type="checkbox"/> Pos <input type="checkbox"/> Neg <input type="checkbox"/> Unk <input type="checkbox"/> Sent for CXR
5. A Chest X-Ray? (<i>Appendix 5</i>)					<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal

Before onset of current TB illness, were you ever:	YES/NO/ or Unknown	Est Date	Name of Doctor or Facility That Treated You*	Drugs Taken		
				Name (<i>Appendix 6 & 7</i>)	# mos	Why Stopped?
6. Offered medicine to prevent active TB?						
7. Diagnosed with Active TB disease?						

* Use Health Care Facility List (*Appendix 2*) if needed

Prior History Intake for TB Cases and Suspects

page 2 of 2

Before current TB illness When was the last time you had a physician exam for:	Est Date	Name of Doctor or Facility*	TB Tests and TX?		
			TST	CXR	TX
8. Employment					
9. Routine Check Up					
10. Injury or Accident					
11. Prenatal Checkup					
12. Other (_____)					

Have you ever been in (or an employee of) a:	Yes/No	Name of Facility*	From (Date)	To (Date)	TB Tests & TX?		
					TST	CXR	TX
13. Homeless Shelter or Welfare Hotel							
14. Prison or Jail							
15. Drug or Alcohol Rehab. Program							
16. Grade/High School (in past 5 years)							
17. Long-Term Care Facility							

Have you ever:	Yes/No	Name of Doctor or Facility*	From (Date)	To (Date)	TB Tests & TX?		
					TST	CXR	TX
18. Tested positive for HIV?							
19. Been treated for HIV?							
20. Had contact with someone with active TB?							
21. Taken steroids for longer than one month?							
22. Had part of your stomach or intestine removed?							
23. Been treated for cancer? Location or type of cancer? _____							
24. Been treated for diabetes?							
25. Been told that you had silicosis or lung problem from dust?							
26. Had an organ transplant?							
27. Used needles to inject heroin or similar drugs?							
28. Snorted heroin or smoked crack cocaine?							
29. Been told you have a drinking problem?							
30. Received BCG (TB Vaccine that leaves scar on upper arm)?							

Interviewer's Assessment: Was this case potentially preventable? Yes No Unknown

Why or Why Not? _____

Based on which questions? _____

Poster Abstract 2001 National TB Controller's Workshop

MISSED OPPORTUNITIES FOR PREVENTING TB IN NEWARK, 2000

Hayden CH, Napolitano E, Mangura BT
New Jersey Medical School National Tuberculosis Center at UMDNJ, Newark, NJ

Background: Most TB cases occur among persons with TB medical and/or population risk factors of latent TB infection (LTBI) for years prior to developing active disease. Many of these persons have been under some form of medical care prior to developing disease when TB testing and treatment of LTBI could have been carried out.

Objective: To identify patient encounters with health care providers prior to the TB diagnosis when TB testing and treatment of LTBI could have been carried out to prevent these cases.

Methods: Since June 2000, the National TB Center (NTBC) has routinely asked TB patients about previous encounters with the health care system and whether or not TB services were provided at those times. Available demographic, TB risk factor, and TB diagnostic data were correlated with these findings. Data was collected on TB cases reported from June-December 2000.

Results: All the patients in this review had one or more TB risk factors; yet less than 60% had received a TST prior to diagnosis and, of these, 75% had LTBI. Only one-third of those with LTBI were placed on treatment and none completed a full course of therapy. Missed opportunities occurred among 18 of the 21 patients reviewed. Of these:

- 9 involved failure to TST when a TB risk factor was present
- 6 involved not starting treatment for LTBI
- 3 involved not completing prescribed regimens

Of the 8 foreign-born patients excluded for analysis:

- All developed TB within 12 months of entry (4 within one month)
- 2 reported inadequate treatment prior to entry
- 3 reported no TB exam prior to entry (1 child, 1 student, 1 refugee)
- 2 reported a normal CXR prior to entry
- 1 was classified B2

Conclusion: In order to accelerate progress towards TB elimination, programs will need to:

- Identify providers serving persons with TB risk factors prevalent in the community
- Strengthen targeted testing and treatment of LTBI among these providers through education, consultation, and/or referral services

EXAMPLE
Health Care Facilities By Facility Name

Type Facility	Facility Name	AKA	Street #	Street Name	City
HIV	Biggs Medical Cneter	Family Treatment Center	201	Leigh Lane	Phthisis
Comm Hlth Ctr	Calmette Health Center	Roentgen Primary Care Center	741	Chopin Place	Upper Tubercle
Shelter	Domagk Interfaith Network		47	Paganini Street	Consumption
HIV	Ferebee Care Center		150	Mann Street	Lower Lunger
HIV	Flick Medical Outreach	Society for HIV Prevention	268	Locke Blvd	Pottstown
DTC	Frost Clinic		57-59	Keats Blvd.	Phthisis
Comm Hlth Ctr	Guerin Primary Care Center	Roentgen Primary Care Center	444	Byron Street	Upper Tubercle
DTC	Hipprocrates Residential	Hygenic Regimen Center	365	Ehrlich Way	Pottstown
CF	Koch County Jail – Annex		45	Lanier Lane	Consumption
CF	Koch County Jail – Juvenile Detention		70	Bronte Street	Consumption
CF	Koch County Jail – Main		60	Bernhardt Blvd	Consumption
CF	Koch County Jail – Residential		461-63	Burns Avenue	Consumption
DTC	Koch Substance Abuse Ctr I	Epiphany House	164	Gauguin Street	South Scrofula
DTC	Koch Substance Abuse Ctr II	New Hope Foundation	461	Thoreau Ave	South Scrofula
Comm Hlth Ctr	Laennec Health Center	Roentgen Primary Care Center	516	Camus Court	Upper Tubercle
Shelter	Lehmann Home and Mission		79	Orwell Avenue	Phthisis
Shelter	Middlebrook Outreach Center	Multi-Cultural Center	712	Stevenson Avenue	South Scrofula
Hospital	Osler General Hospital		300	Maughham Ave	Phthisis
Shelter	Pott Lighthouse Center		487	Poe Street	Lower Lunger
DTC	Riley Habitare		687	Dostoyevsky Drive	Pottstown
Comm Hlth Ctr	Roentgen Primary Care Center		101	Checkhov Street	Upper Tubercle
HIV	Roentgen Primary Care Center		101	Checkhov Street	Phthisis
Hospital	Schatz Hospital		155	O'Neill Place	Lower Lunger
Hospital	Trudeau Hospital	Big Red	832	de Maupassante Ave	Pottstown
Hospital	Villemin Mount Olympus Center		1160	Nightengale Blvd	Consumption
Hospital	Waksman Medical Center		201	Stravinski Street	South Scrofula
DTC	Wells Treatment Center	Airborne Alliance	160	Emerson Street	Lower Lunger
Shelter	Ziehl Neelson Guild		56	Shelley Street	South Scrofula

This is a sample spreadsheet (using Excel) listing the health care facilities and other providers in the community which serve clients at high risk for TB. This list is sorted alphabetically by Facility name. By using the sort feature of the spreadsheet software, different versions of the list (e.g., By Type Facility, by Street Address, or by City) can be generated and used to help the patient recall the name and location of the health care facility.

EXAMPLE
Health Care Facilities By Type Facility and Facility Name

Type Facility	Facility Name	AKA	Street #	Street Name	City
CF	Koch County Jail – Annex		45	Lanier Lane	Consumption
CF	Koch County Jail – Juvenile Detention		70	Bronte Street	Consumption
CF	Koch County Jail – Main		60	Bernhardt Blvd	Consumption
CF	Koch County Jail – Residential		461-63	Burns Avenue	Consumption
Comm Hlth Ctr	Calmette Health Center	Roentgen Primary Care Center	741	Chopin Place	Upper Tubercle
Comm Hlth Ctr	Guerin Primary Care Center	Roentgen Primary Care Center	444	Byron Street	Upper Tubercle
Comm Hlth Ctr	Laennec Health Center	Roentgen Primary Care Center	516	Camus Court	Upper Tubercle
Comm Hlth Ctr	Roentgen Primary Care Center		101	Checkhov Street	Upper Tubercle
DTC	Frost Clinic		57-59	Keats Blvd.	Phthisis
DTC	Hippocrates Residential	Hygenic Regiment Center	365	Ehrlich Way	Pottstown
DTC	Koch Substance Abuse Ctr I	Epiphany House	164	Gauguin Street	South Scrofula
DTC	Koch Substance Abuse Ctr II	New Hope Foundation	461	Thoreau Ave	South Scrofula
DTC	Riley Habitare		687	Dostoyevsky Drive	Pottstown
DTC	Wells Treatment Center	Airborne Alliance	160	Emerson Street	Lower Lungur
HIV	Biggs Medical Center	Family Treatment Center	201	Leigh Lane	Phthisis
HIV	Ferrebee Care Center		150	Mann Street	Lower Lungur
HIV	Flick Medical Outreach	Society for HIV Prevention	268	Locke Blvd	Pottstown
HIV	Roentgen Primary Care Center		101	Checkhov Street	Phthisis
Hospital	Ostler Genreal Hospital		300	Maughham Ave	Phthisis
Hospital	Schatz Hospital		155	O'Neill Place	Lower Lungur
Hospital	Trudeau Hospital	Big Red	832	de Maupassante Ave	Pottstown
Hospital	Villemin Mount Olympus Center		1160	Nightengale Blvd	Consumption
Hospital	Waksman Medical Center		201	Stravinski Street	South Scrofula
Shelter	Domagk Interfaith Network		47	Paganini Street	Consumption
Shelter	Lehmann Home and Mission		79	Orwell Avenue	Phthisis
Shelter	Middlebrook Outreach Center	Multi-Cultural Center	712	Stevenson Avenue	South Scrofula
Shelter	Pott Lighthouse Center		487	Poe Street	Lower Lungur
Shelter	Ziehl Neelson Guild		56	Shelley Street	South Scrofula

This is a the same list sorted by Type Facility and then by Facility Name

EXAMPLE
Health Care Facilities By Street Name

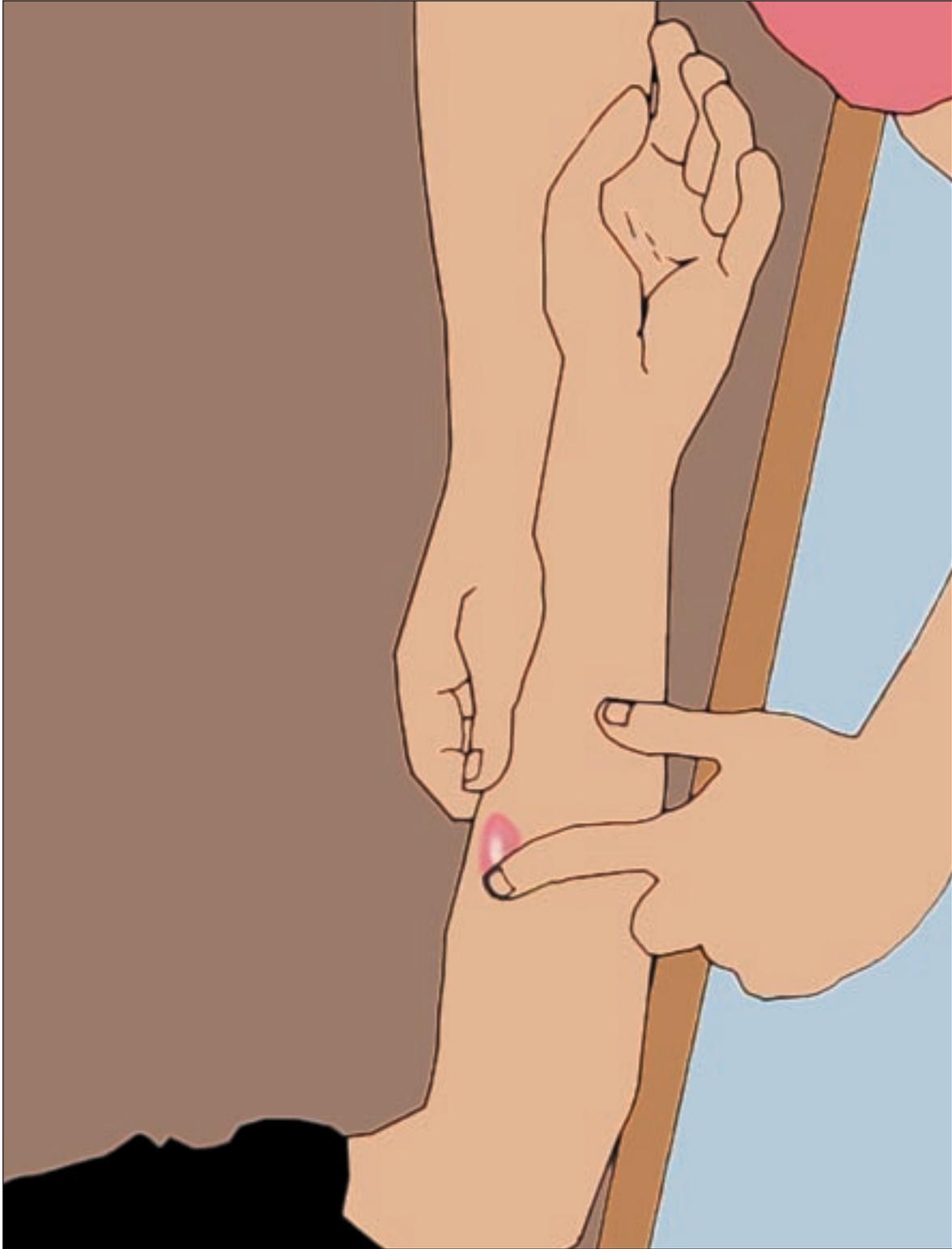
Type Facility	Facility Name	AKA	Street #	Street Name	City
CF	Koch County Jail – Main		60	Bernhardt Blvd	Consumption
CF	Koch County Jail – Juvenile Detention		70	Bronte Street	Consumption
CF	Koch County Jail – Residential		461-63	Burns Avenue	Consumption
Comm Hlth Ctr	Guerin Primary Care Center	Roentgen Primary Care Center	444	Byron Street	Upper Tubercle
Comm Hlth Ctr	Laennec Health Center	Roentgen Primary Care Center	516	Camus Court	Upper Tubercle
Comm Hlth Ctr	Roentgen Primary Care Center		101	Checkhov Street	Upper Tubercle
HIV	Roentgen Primary Care Center		101	Checkhov Street	Phthisis
Comm Hlth Ctr	Calmette Health Center	Roentgen Primary Care Center	741	Chopin Place	Upper Tubercle
Hospital	Trudeau Hospital	Big Red	832	de Maupassante Ave	Pottstown
DTC	Riley Habitare		687	Dostoyevsky Drive	Pottstown
DTC	Hippocrates Residential	Hygenic Regimen Center	365	Ehrlich Way	Pottstown
DTC	Wells Treatment Center	Airborne Alliance	160	Emerson Street	Lower Lunger
DTC	Koch Substance Abuse Ctr I	Epiphany House	164	Gauguin Street	South Scrofula
DTC	Frost Clinic		57-59	Keats Blvd.	Phthisis
CF	Koch County Jail – Annex		45	Lanier Lane	Consumption
HIV	Biggs Medical Cneter	Family Treatment Center	201	Leigh Lane	Phthisis
HIV	Flick Medical Outreach	Society for HIV Prevention	268	Locke Blvd	Pottstown
HIV	Ferrebee Care Center		150	Mann Street	Lower Lunger
Hospital	Osler Genreal Hospital		300	Maughham Ave	Phthisis
Hospital	Villemin Mount Olympus Center		1160	Nightengale Blvd	Consumption
Hospital	Schatz Hospital		155	O'Neill Place	Lower Lunger
Shelter	Lehmann Home and Mission		79	Orwell Avenue	Phthisis
Shelter	Domagk Interfaith Network		47	Paganini Street	Consumption
Shelter	Pott Lighthouse Center		487	Poe Street	Lower Lunger
Shelter	Ziehl Neelson Guild		56	Shelley Street	South Scrofula
Shelter	Middlebrook Outreach Center	Multi-Cultural Center	712	Stevenson Avenue	South Scrofula
Hospital	Waksman Medical Center		201	Stravinski Street	South Scrofula
DTC	Koch Substance Abuse Ctr II	New Hope Foundation	461	Thoreau Ave	South Scrofula

This is a the same list sorted by Street Name

Appendix 3



Getting a Tuberculin Skin Test



Tuberculin Skin Test Reading (Positive)

Appendix 5



Normal Chest X-Ray

Appendix 6

Drugs To Prevent Active TB Disease

Sometimes with



INH
(Isoniazid)



B-6
(Pyridoxine)

Appendix 7

Drugs To Treat Active TB Disease



INH
(Isoniazid)



RIF
(Rifampin)



PZA
(Pyrazinamide)



EMB
Ethambutol

EXAMPLE

Missed Opportunities Summary Form (Consecutive Patients - page 1 of 2)

Patient Name Name/ID	Case Manager	Age	Med RFs (1)	Pop RFs (2)	Health Care Provider Encounter Prior to TB DX		Prevent Ability (4)	How Case Could Have Been Prevented	
					Type	Date			
1	245	43	8,10		2	7/97	PMD A	5	TST - by PMD
2	246	29		8	2	2/97	PMD B	2	TST + by PMD, no TX
3	245	28		8				7	Refugee to US 10/99 - No exam abroad or in US Prior to DX 2/00
4	247	30		8	2	6/99	PMD C	1	TST + by PMD, no TX
5	247	47	1,5	1,3	3	8/98	Health Dept A	2	TST + by HD, refused TX
6	246	47		1	7		Jail A	1	No TST by Jail
7	245	37	1,6		8	1998	DICA	2	TST + at DTC, no TX
8	246	45	2		2	9/98	PMD Unknown	1	No TST by PMD
9	247	36	7		2	3/00	PMD D	1	No TST by PMD
10	245	12		8	8	12/98	School A	5	TST by School
11	226	29		8				7	Immigrant to US 8/00. Neg CXR on entry. No exam in US prior to DX 8/00

Medical Risk Factors (1)	Population Risk Factors (2)	Type HCP (3)	Preventability Codes (4)
1=Contact 2=HIV 3=Convertor 4=Abnormal CXR-Old TB 5=Injection Drug Use 6=Non-injecting Drug use 7=Excess Alcohol 8=Diabetes 9=Steroid Therapy 10=Cancer of Neck or Head 11=Dialysis/Renal Failure 12=Gastrectomy/Intestinal Bypass 13=Silicosis 14=> 10% below ideal weight 15=Prior TB-Inadequate TX 16=organ Transplant	1=Prison/jail inmate 2=Prison/jail employee 3=Other long-term facility resident 4=Other long-term facility employee 5=Health Care Employee 6=Homeless shelter resident 7=Homeless shelter employee 8=Foreign-born in US <5 years 9=Travel to high-risk country 10=Migrant Worker 11=Child exposed to high risk adult 12=Attend balls 13=High risk school 14=transgender	1=Hospital 2=PMD 3=TB/Chest Clinic 4=Other Public Health Clinic 5=School/College 6=OB/GYN 7=Occupational Health 8=Correctional Facility 9=Drug Treatment Center 10=HIV Care Facility 11=Other _____	1=Preventable: TB Risk Factor, No TST 2=Preventable: LTBI, No Treatment 3=Preventable: LTBI, Incomplete Treatment 4=Preventable: Copntact Not Identified Prior to DX 5=Not Preventable: Appropriate Testing &/or TX Provided Prior to DX 6=Not Preventable: Foreign Born, TB Identified on Entry Exam 7=Not Preventable: Recent Entry to US, No Exam Abroad or in US Prior to DX 8=Other 9=Unknown

EXAMPLE
Missed Opportunities Summary Form (Consecutive Patients - page 2 of 2)

Patient Name Name/ID	Case Manager	Age	Med RFs (1)	Pop RFs (2)	Health Care Provider Encounter Prior to TB DX		Prevent Ability (4)	How Case Could Have Been Prevented
					Type	Date		
12	245	22		8			7	To US 1999 as Visitor. No exam abroad or in US prior to DX 5/00
13	246	25		8			7	To US 09/99 as Student. No exam abroad or in US prior to DX 2/00
14	247	19		8	9	12/99	5	TST - at school testing
15	245	34	5	1	7	1998	1	No TST at jail
16	246	68	15	8			7	To US 10/00 as Visitor. Sm- and 2 months TX prior to entry to US. DX in US 10/00
17	247	55	7	1	1	1999	1	No TST by Hospital
18	245	23	1	8	4	1998	3	TST + as contact, only took 4 mos TX
19	246	50					8	No known risk factors; no exam during last 5 years
20	247	8 mos			2	4/00	8	Infant No known risk factors prior to DX. Source case not identified till after DX & not preventable
21	245	74		8			6	To US as refugee 4/00. Identified as Class B prior to entry and DX'd 4/00

Medical Risk Factors (1)	Population Risk Factors (2)	Type HCP (3)	Preventability Codes (4)
1=Contact 2=HIV 3=Convertor 4=Abnormal CXR-Old TB 5=Injection Drug Use 6=Non-injecting Drug use 7=Excess Alcohol 8=Diabetes 9=Steroid Therapy 10=Cancer of Neck or Head 11=Dialysis/Renal Failure 12=Gastrectomy/Intestinal Bypass 13=Silicosis 14=> 10% below ideal weight 15=Prior TB-Inadequate TX 16=organ Transplant	1=Prison/jail inmate 2=Prison/jail employee 3=Other long-term facility resident 4=Other long-term facility employee 5=Health Care Employee 6=Homeless shelter resident 7=Homeless shelter employee 8=Foreign-born in US <5 years 9=Travel to high-risk country 10=Migrant Worker 11=Child exposed to high risk adult 12=Attend balls 13=High risk school 14=transgender	1=Hospital 2=PMD 3=TB/Chest Clinic 4=Other Public Health Clinic 5=School/College 6=OB/GYN 7=Occupational Health 8=Correctional Facility 9=Drug Treatment Center 10=HIV Care Facility 11=Other _____	1=Preventable: TB Risk Factor, No TST 2=Preventable: LTBI, No Treatment 3=Preventable: LTBI, Incomplete Treatment 4=Preventable: Copntact Not Identified Prior to DX 5=Not Preventable: Appropriate Testing &/or TX Provided Prior to DX 6=Not Preventable; Foreign Born, TB Identified on Entry Exam 7=Not Preventable: Recent Entry to US, No Exam Abroad or in US Prior to DX 8=Other 9=Unknown

EXAMPLE

Missed Opportunities Summary Form (By Health Case Provider - page 1 of 2)

Patient Name Name/ID	Case Manager	Age	Med RFs (1)	Pop RFs (2)	Health Care Provider Encounter Prior to TB DX		Prevent Ability (4)	How Case Could Have Been Prevented	
					Type	Date			
5	246	47	1,5	1,3	3	1998	Health Dept A	2	Contact, TST+, Refused TX
23	246	61	1,2		3	1997	Health Dept A	2	HIV+ and contact, TST+, Refused TX
34	245	28	1,2	6	3	1997	Health Dept A	4	Close contact to Aunt 1997. Not named as contact until DX
53	245	33	1,6	1	3	2000	Health Dept A	4	Close contact to cousin. Not named as contact until DX
58	245	15	1,9		3	2000	Health Dept A	4	Close contact to uncle. Not named as contact until DX
6	247	47		1	7	1993	Jail A	1	No TST done in jail
46	245	35	2,5	1	7	1997	Jail A	5	TST+ and TX for LTBI for 6 mos at jail
70	245	47	6,7	1	7	1997	Jail A	3	TST+ at jail, received only 3 mos TX
75	247	58	2,5	1,6	7	1991	Jail A	3	TST+, incomplete TX at jail
15	245	34	5	1,3	7	1998	Jail B	1	No TST at jail
33	246	45	2,5	1	7	2000	Jail B	2	TST+ at jail, TX not offered

Medical Risk Factors (1)	Population Risk Factors (2)	Type HCP (3)	Preventability Codes (4)
1=Contact 2=HIV 3=Convertor 4=Abnormal CXR-Old TB 5=Injection Drug Use 6=Non-injecting Drug use 7=Excess Alcohol 8=Diabetes 9=Steroid Therapy 10=Cancer of Neck or Head 11=Dialysis/Renal Failure 12=Gastrectomy/Intestinal Bypass 13=Silicosis 14=> 10% below ideal weight 15=Prior TB-Inadequate TX 16=organ Transplant	1=Prison/jail inmate 2=Prison/jail employee 3=Other long-term facility resident 4=Other long-term facility employee 5=Health Care Employee 6=Homeless shelter resident 7=Homeless shelter employee 8=Foreign-born in US <5 years 9=Travel to high-risk country 10=Migrant Worker 11=Child exposed to high risk adult 12=Attend balls 13=High risk school 14=transgender	1=Hospital 2=PMD 3=TB/Chest Clinic 4=Other Public Health Clinic 5=School/College 6=OB/GYN 7=Occupational Health 8=Correctional Facility 9=Drug Treatment Center 10=HIV Care Facility 11=Other _____	1=Preventable: TB Risk Factor, No TST 2=Preventable: LTBI, No Treatment 3=Preventable: LTBI, Incomplete Treatment 4=Preventable: Copntact Not Identified Prior to DX 5=Not Preventable: Appropriate Testing &/or TX Provided Prior to DX 6=Not Preventable: Foreign Born, TB Identified on Entry Exam 7=Not Preventable: Recent Entry to US, No Exam Abroad or in US Prior to DX 8=Other 9=Unknown

EXAMPLE

Missed Opportunities Summary Form (By Health Case Provider - page 2 of 2)

Patient Name Name/ID	Case Manager	Age	Med RFs (1)	Pop RFs (2)	Health Care Provider Encounter Prior to TB DX		Prevent Ability (4)	How Case Could Have Been Prevented	
					Type	Date			
25	245	43	2		10	1996	HIV Facility A	3	HIV+ and TST+. Only rec'd 6 mos TX
61	246	43	12	9	1	1994	Hospital A Medical Clinic	5	TST+ and TX for 6 months
32	246	70	12	5	1	2000	Hospital B Medical Clinic	1	No TST done
42		31	4,5	6	1	2000	Hospital B Medical Clinic	1	No TST done
47	247	53	2		2	1996	PMD A	1	Born in Haiti, HIV+, no TST done
49	247	67		9	2	1999	PMD A	1	Travel to Haiti, No TST done
72	247	38	2		2	1998	PMD A	1	Born in Haiti, HIV+, no TST done
3	245	47	5		9	1997	Drug Treatment Center A	1	No TST done
8	247	37	6		9	1998	Drug Treatment Center B	2	TST+, no TX
27	240	34	5		9	1999	Drug Treatment Center C	1	No TST done

Medical Risk Factors (1)

- 1=Contact
- 2=HIV
- 3=Convertor
- 4=Abnormal CXR-Old TB
- 5=Injection Drug Use
- 6=Non-injecting Drug use
- 7=Excess Alcohol
- 8=Diabetes
- 9=Steroid Therapy
- 10=Cancer of Neck or Head
- 11=Dialysis/Renal Failure
- 12=Gastrectomy/Intestinal Bypass
- 13=Silicosis
- 14=> 10% below ideal weight
- 15=Prior TB-Inadequate TX
- 16=organ Transplant

Population Risk Factors (2)

- 1=Prison/jail inmate
- 2=Prison/jail employee
- 3=Other long-term facility resident
- 4=Other long-term facility employee
- 5=Health Care Employee
- 6=Homeless shelter resident
- 7=Homeless shelter employee
- 8=Foreign-born in US <5 years
- 9=Travel to high-risk country
- 10=Migrant Worker
- 11=Child exposed to high risk adult
- 12=Attend balls
- 13=High risk school
- 14=transgender

Type HCP (3)

- 1=Hospital
- 2=PMD
- 3=TB/Chest Clinic
- 4=Other Public Health Clinic
- 5=School/College
- 6=OB/GYN
- 7=Occupational Health
- 8=Correctional Facility
- 9=Drug Treatment Center
- 10=HIV Care Facility
- 11=Other _____

Preventability Codes (4)

- 1=Preventable: TB Risk Factor, No TST
- 2=Preventable: LTBI, No Treatment
- 3=Preventable: LTBI, Incomplete Treatment
- 4=Preventable: Copntact Not Identified Prior to DX
- 5=Not Preventable: Appropriate Testing &/or TX Provided Prior to DX
- 6=Not Preventable; Foreign Born, TB Identified on Entry Exam
- 7=Not Preventable: Recent Entry to US, No Exam Abroad or in US Prior to DX
- 8=Other
- 9=Unknown



NJMS National TB Center
225 Warren Street – 1st Floor, West Wing
PO Box 1709, Newark, NJ 07101-1709
Phone: 973-972-0979
<http://www.umdnj.edu/ntbcweb>