Identifying Missed Opportunities For Preventing TB
A Resource For TB Programs
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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 Opportunities Summary Form (By Health Care Provider) 28
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


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

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
    - Holidays
    - Birthdays
    - Anniversaries
  - ✔ Important single life events, e.g.:
    - Entering the US
    - 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) spreadsheet (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 spreadsheet 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.

**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:
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)
Feedback:

- Case managers should complete a Feedback Form (Appendix 8) on a selected number of patients.
- These can be used by the person with overall responsibility as a basis for discussing problems and issues during periodic meetings with the case managers.
- Feedback may also be used to modify the initial intake form or appendices to meet local needs.

A line list (Missed Opportunities Summary Form—Appendix 9) has been developed on which to summarize key information for determining the preventability of cases interviewed.

For consistency, codes have been assigned to Medical Risk Factors, Population Risk Factors, Types of Health Care Providers, and Preventability categories. Health Care Provider information should reflect one or more encounters at which time there was a clear opportunity to carry out targeted TB testing and or treatment of LTBI which might have prevented the case from occurring. In the Preventability Code column, the case manager should enter the code which best reflects the reason why the either was or was not preventable.

Appendix 10 is a 2-page Completed Sample of the Missed Opportunities Summary Form with information from 21 consecutive patients reviewed. This provides a broad range of the types of entries that might be made.

Appendix 11 is a 2-page Completed Sample of the Missed Opportunities Summary Form with information on cases which were seen by selected health care providers in the community prior the diagnosis of TB. Users may want to develop a Spreadsheet to facilitate sorting by TB risk factors, type and name of health care provider, and preventability codes.
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.
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 (______)

<table>
<thead>
<tr>
<th>Before onset of current TB illness, when did you last have</th>
<th>Never</th>
<th>Est. Date</th>
<th>Name of Doctor or Facility*</th>
<th>Reason for Test</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. A Tuberculin Skin Test? (Appendix 3 &amp; 4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. A Chest X-Ray? (Appendix 5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Before onset of current TB illness, were you ever:</th>
<th>YES/NO/ or Unknown</th>
<th>Est Date</th>
<th>Name of Doctor or Facility That Treated You*</th>
<th>Drugs Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Offered medicine to prevent active TB?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Diagnosed with Active TB disease?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Use Health Care Facility List (Appendix 2) if needed
### Before current TB illness
When was the last time you had a physician exam for:

<table>
<thead>
<tr>
<th></th>
<th>Est Date</th>
<th>Name of Doctor or Facility*</th>
<th>TB Tests and TX?</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Routine Check Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Injury or Accident</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Prenatal Checkup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Other (___________)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Have you ever been in (or an employee of) a:

<table>
<thead>
<tr>
<th></th>
<th>Yes/No</th>
<th>Name of Facility*</th>
<th>From (Date)</th>
<th>To (Date)</th>
<th>TB Tests &amp; TX?</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td></td>
<td>Homeless Shelter or Welfare Hotel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td></td>
<td>Prison or Jail</td>
<td></td>
<td></td>
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<tr>
<td>15.</td>
<td></td>
<td>Drug or Alcohol Rehab. Program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td></td>
<td>Grade/High School (in past 5 years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td></td>
<td>Long-Term Care Facility</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Have you ever:

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

**Interviewer’s Assessment:** Was this case potentially preventable?  □ Yes  □ No  □ Unknown
Why or Why Not?  
Based on which questions?  

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15
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

Appendix 1
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
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.
# Health Care Facilities By Type Facility and Facility Name

<table>
<thead>
<tr>
<th>Type Facility</th>
<th>Facility Name</th>
<th>AKA</th>
<th>Street #</th>
<th>Street Name</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF</td>
<td>Koch County Jail – Annex</td>
<td>45</td>
<td>Lanier Lane</td>
<td>Consumption</td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>Koch County Jail – Juvenile Detention</td>
<td>70</td>
<td>Bronte Street</td>
<td>Consumption</td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>Koch County Jail – Main</td>
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This is the same list sorted by Type Facility and then by Facility Name.
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<tr>
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<th>Type Facility</th>
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Appendix 4

Tuberculin Skin Test Reading (Positive)
Appendix 5

Normal Chest X-Ray
Drugs To Treat Active TB Disease

INH B-6 (Isoniazid) (Pyridoxine)

Drugs To Prevent Active TB Disease

Sometimes with B-6 (Pyridoxine)

INH (Isoniazid)
## Appendix 8

### Prior History Intake Form for TB Cases and Suspects Feedback

<table>
<thead>
<tr>
<th>Name of Case Manager</th>
<th>Date of Interview <em><strong>/</strong></em>/___</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name (or ID Number) of Patient</td>
<td></td>
</tr>
</tbody>
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1. How difficult was it for the patient to recall dates of various events (*examinations, treatments, residencies*)?  
   
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<tr>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Difficulty</td>
<td>Extremely Difficult</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   What method of prompting did you find most helpful?  
   *(e.g., asking patient what month, season, or holiday event occurred)*  
   
   ____________________________________________________________

2. How difficult was it for the patient to recall the specific names of doctors, clinics, health care facilities, or residencies?  
   
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Difficulty</td>
<td>Extremely Difficult</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

   Were the line lists of “Health Care Facilities” useful in helping the patient recall names of facilities?  
   ☐ Yes  ☐ No  ☐ Not Used

   What techniques did you find helpful in using the Line List?  
   ____________________________________________________________

3. Which questions did the patient seem reluctant to answer and how would you recommend more forthright responses?  
   
   #_____ Recommend  
   #_____ Recommend  
   #_____ Recommend

4. What other difficulties did you experience in completing this form with this patient?  
   ____________________________________________________________
   
   ____________________________________________________________
   
   ____________________________________________________________

5. What other suggestions do you have for improving the quality of patient responses to questions on this form?  
   ____________________________________________________________
   
   ____________________________________________________________
   
   ____________________________________________________________
## Missed Opportunities Summary Form

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Case Manager</th>
<th>Age</th>
<th>Med RFs (1)</th>
<th>Pop RFs (2)</th>
<th>Health Care Provider Encounter Prior to TB DX</th>
<th>Preventability Codes (4)</th>
<th>How Case Could Have Been Prevented</th>
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<tr>
<td>Name/ID</td>
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<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
<td>Name of Health Care Provider</td>
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### 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/fail inmate
- 2=Prison/fail 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: Contact 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
## Missed Opportunities Summary Form (Consecutive Patients - page 1 of 2)

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### Medical Risk Factors (1)
- 1=Contact
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- 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
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- 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
## Missed Opportunities Summary Form (Consecutive Patients - page 2 of 2)

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<th>How Case Could Have Been Prevented</th>
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<td>Prevent Ability (4)</td>
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### 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: Contact Not Identified Prior to DX
5. Not Preventable: Appropriate Testing &/or TX Provided Prior to DX
7. Not Preventable: Recent Entry to US, No Exam Abroad or in US Prior to DX
8. Other
9. Unknown
### Missed Opportunities Summary Form

**By Health Case Provider - page 1 of 2**

<table>
<thead>
<tr>
<th>Patient Name Name/ID</th>
<th>Case Manager</th>
<th>Age</th>
<th>Med RFs (1)</th>
<th>Pop RFs (2)</th>
<th>Health Care Provider Encounter Prior to TB DX</th>
<th>Prevent Ability (4)</th>
<th>How Case Could Have Been Prevented</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>47</td>
<td>1,5</td>
<td>1,3</td>
<td>3 1998 Health Dept A</td>
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<td>Contact, TST+, Refused TX</td>
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<td>23</td>
<td>61</td>
<td>1,2</td>
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<td>3 1997 Health Dept A</td>
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<td>HIV+ and contact, TST+, Refused TX</td>
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<tr>
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<td>34</td>
<td>28</td>
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<td>Gose contact to Aunt 1997. Not named as contact until DX</td>
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<td>53</td>
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<td>4</td>
<td>Gose contact to cousin. Not named as contact until DX</td>
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<tr>
<td></td>
<td>58</td>
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<td></td>
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<td>Gose contact to uncle. Not named as contact until DX</td>
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<td>6</td>
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<td></td>
<td>7 1993 Jail A</td>
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<td>No TST done in jail</td>
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<td>46</td>
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<td>TST+ at jail, received only 3 mos TX</td>
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<td>1</td>
<td>7 2000 Jail B</td>
<td>2</td>
<td>TST+ at jail, TX not offered</td>
</tr>
</tbody>
</table>

**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=HV Care Facility  
11=Other

**Preventability Codes (4)**

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

<table>
<thead>
<tr>
<th>Patient Name Name/ID</th>
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<th>Age</th>
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</thead>
<tbody>
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<td>1 2000 Hospital B Medical Clinic</td>
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<tr>
<td>42</td>
<td>246</td>
<td>31</td>
<td>45</td>
<td>6</td>
<td>1 2000 Hospital B Medical Clinic</td>
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<td>No TST done</td>
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<td>2 1996 PMD A</td>
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<td>9 1997 Drug Treatment Center A</td>
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<td>9 1998 Drug Treatment Center B</td>
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<td></td>
<td>9 1999 Drug Treatment Center C</td>
<td>1</td>
<td>No TST done</td>
</tr>
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