TB: Infection Control

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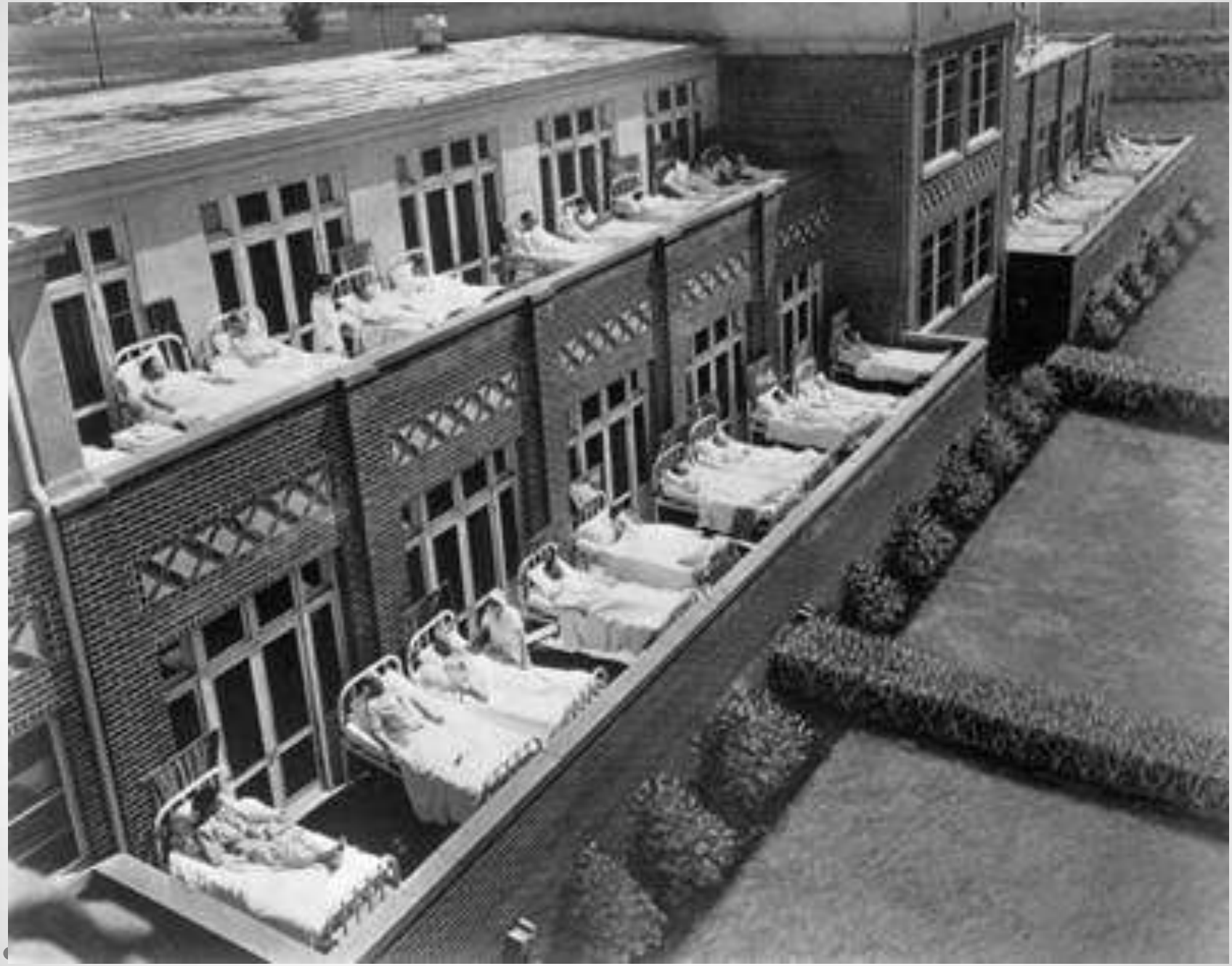


High Risk Workplaces

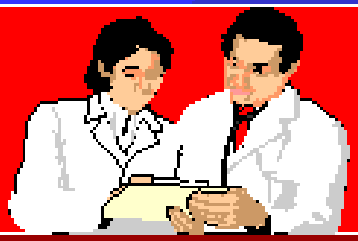
- Health care facilities
- Correctional institutions
- Long term care facilities
- Homeless shelters
- Drug treatment centers

2011 Reporting Area	Total Cases	Cases with Information on Occupation No.	Cases with Information on Occupation (%)	Percentage of Cases by Occupation[1] Unemployed	Health Care Worker	Correctional Employee	Migrant Worker	Retired	Not Seeking Employment	Other
United States	**9,946**	**9,587**	**96.4**	**(30.4)**	**(3.7)**	**(0.1)**	**(1.6)**	**(16.1)**	**(13.9)**	**(34.2)**
Alabama	150	150	100	(23.3)	(1.3)	(0.7)	(3.3)	(13.3)	(26.7)	(31.3)
Alaska	61	55	90.2	(58.2)	(1.8)	(0.0)	(0.0)	(9.1)	(5.5)	(25.5)
Arizona	242	205	84.7	(35.6)	(4.9)	(0.0)	(9.3)	(14.1)	(13.2)	(22.9)
Arkansas	81	81	100	(21.0)	(4.9)	(1.2)	(0.0)	(21.0)	(13.6)	(38.3)
California	2,193	2,158	98.4	(26.7)	(3.7)	(0.1)	(2.5)	(20.5)	(13.9)	(32.5)
Colorado	62	62	100	(14.5)	(8.1)	(0.0)	(0.0)	(9.7)	(29.0)	(38.7)
Connecticut	80	72	90	(25.0)	(6.9)	(0.0)	(1.4)	(9.7)	(15.3)	(41.7)

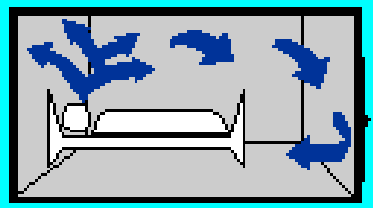
Regulations

- OSHA
- CMS
- State of CT Public Health Code
  → reporting
  → role of TB control & LHD
- Facility P&P

TB Infection Control Hierarchy



Administrative Controls



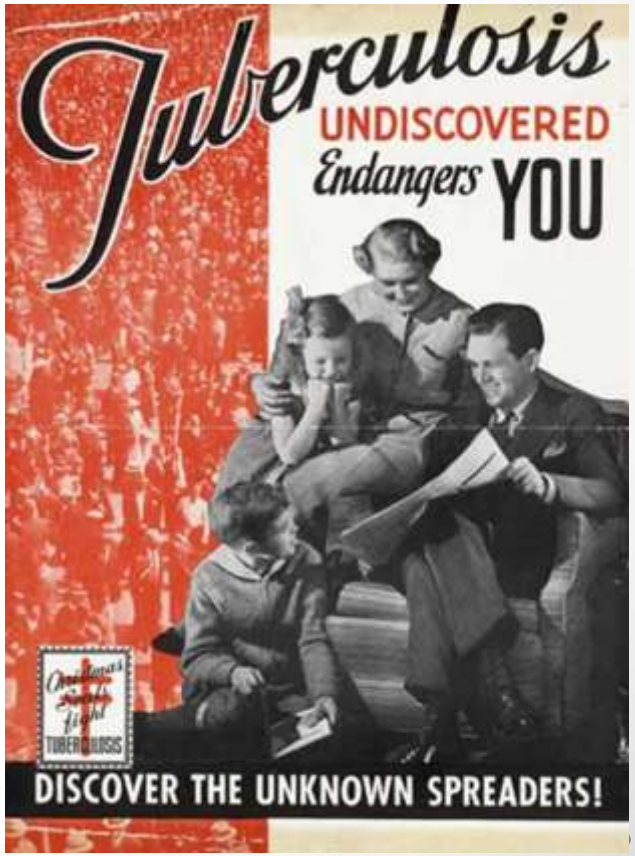
Engineering Controls

Personal Respiratory Protection

CDC

Administrative Controls

- Assign responsibility for TB Infection Control
- Develop and update TB Infection Control Plan
  → Plans if accept TB patients
  → Plans if do not accept TB patients



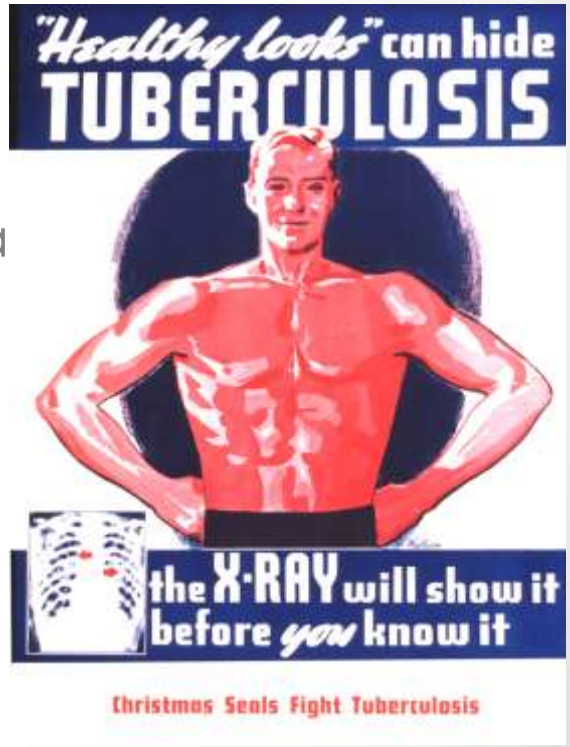
Administrative Controls cont.

- How to recognize TB promptly and what to do

HISTORY/SYMPTOMS	Yes	No	Don't Know
1. Do you have a cough that has lasted longer than 3 weeks?			
2. Have you lost your appetite?			
3. Have you lost weight without dieting?			
4. Have you had fever, chills, or night sweats?			
5. Have you coughed up blood?			
6. Have you been feeling very tired?			
7. Have you ever had a positive tuberculin skin test (TST) result or interferon gamma release assay (IGRA) result?			
8. Have you ever had an abnormal chest x-ray?			
9. Have you recently had the mucous you coughed up tested for TB?			
10. Have you ever been told you had TB?			
11. Have you ever taken medicine for TB?			
12. Have you ever lived with or had close contact with someone who had TB?			

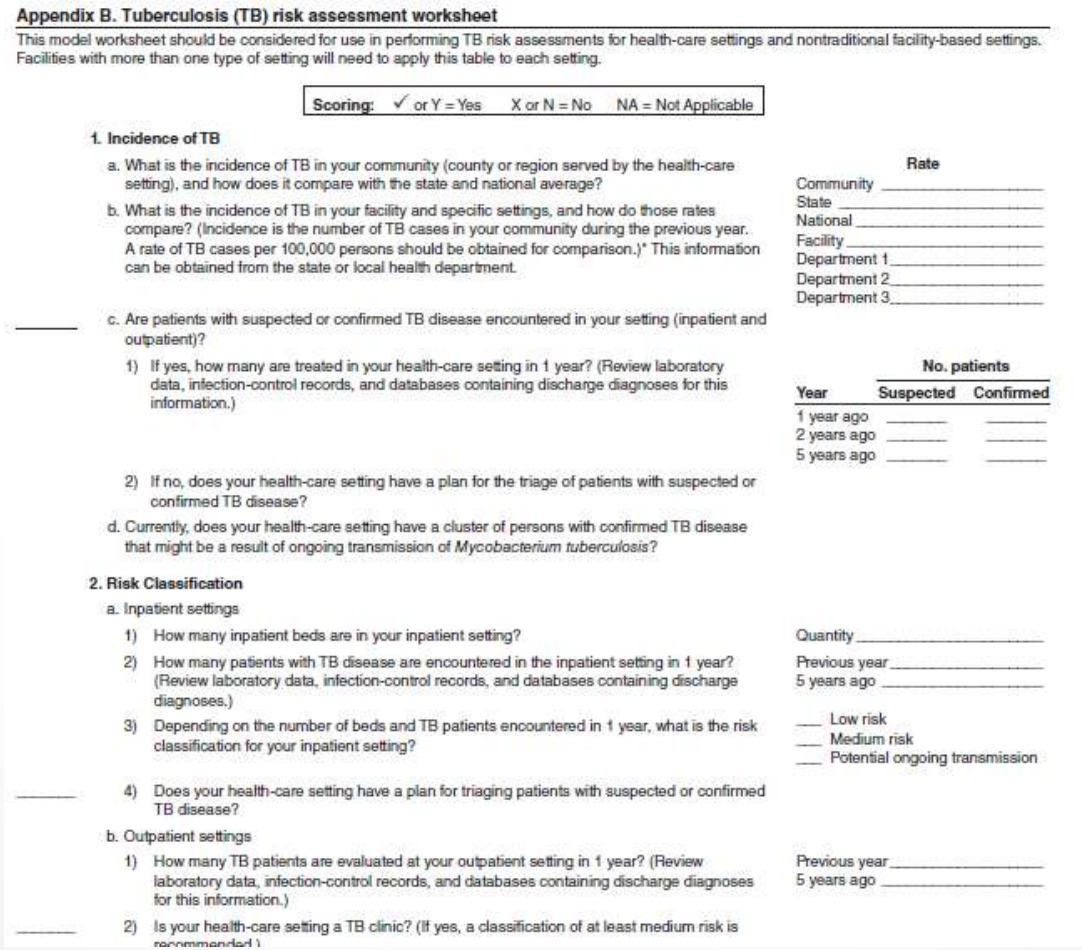
Administrative Controls cont.

- Know risk factors for developing TB disease
  - → HIV strongest known risk factor
  - → Children < 5 years of age
  - → Persons on immunosuppressive therapy
  - →Persons with silicosis, IDDM, ESRD, leukemia lymphoma, or CA of head, neck of lung
  - →Persons who have had gastrectomy or jejunoileal/ gastric by-pass
  - →Persons weigh less than 90% of IBW
  - →Substance abuse



Administrative Controls cont.

- Annual risk assessment



Appendix B. Tuberculosis (TB) risk assessment worksheet

This model worksheet should be considered for use in performing TB risk assessments for health-care settings and nontraditional facility-based settings. Facilities with more than one type of setting will need to apply this table to each setting.

Scoring: ✓ or Y = Yes X or N = No NA = Not Applicable

1. Incidence of TB

a. What is the incidence of TB in your community (county or region served by the health-care setting), and how does it compare with the state and national average?

b. What is the incidence of TB in your facility and specific settings, and how do those rates compare? (Incidence is the number of TB cases in your community during the previous year. A rate of TB cases per 100,000 persons should be obtained for comparison.)* This information can be obtained from the state or local health department.

Rate

Community _____
State _____
National _____
Facility _____
Department 1 _____
Department 2 _____
Department 3 _____

_____ c. Are patients with suspected or confirmed TB disease encountered in your setting (inpatient and outpatient)?

1) If yes, how many are treated in your health-care setting in 1 year? (Review laboratory data, infection-control records, and databases containing discharge diagnoses for this information.)

	No. patients	
Year	Suspected	Confirmed
1 year ago	_____	_____
2 years ago	_____	_____
5 years ago	_____	_____

2) If no, does your health-care setting have a plan for the triage of patients with suspected or confirmed TB disease?

d. Currently, does your health-care setting have a cluster of persons with confirmed TB disease that might be a result of ongoing transmission of *Mycobacterium tuberculosis*?

2. Risk Classification

a. Inpatient settings

1) How many inpatient beds are in your inpatient setting?

Quantity _____

2) How many patients with TB disease are encountered in the inpatient setting in 1 year? (Review laboratory data, infection-control records, and databases containing discharge diagnoses.)

Previous year _____
5 years ago _____

3) Depending on the number of beds and TB patients encountered in 1 year, what is the risk classification for your inpatient setting?

___ Low risk
___ Medium risk
___ Potential ongoing transmission

_____ 4) Does your health-care setting have a plan for triaging patients with suspected or confirmed TB disease?

b. Outpatient settings

1) How many TB patients are evaluated at your outpatient setting in 1 year? (Review laboratory data, infection-control records, and databases containing discharge diagnoses for this information.)

Previous year _____
5 years ago _____

_____ 2) Is your health-care setting a TB clinic? (If yes, a classification of at least medium risk is recommended.)

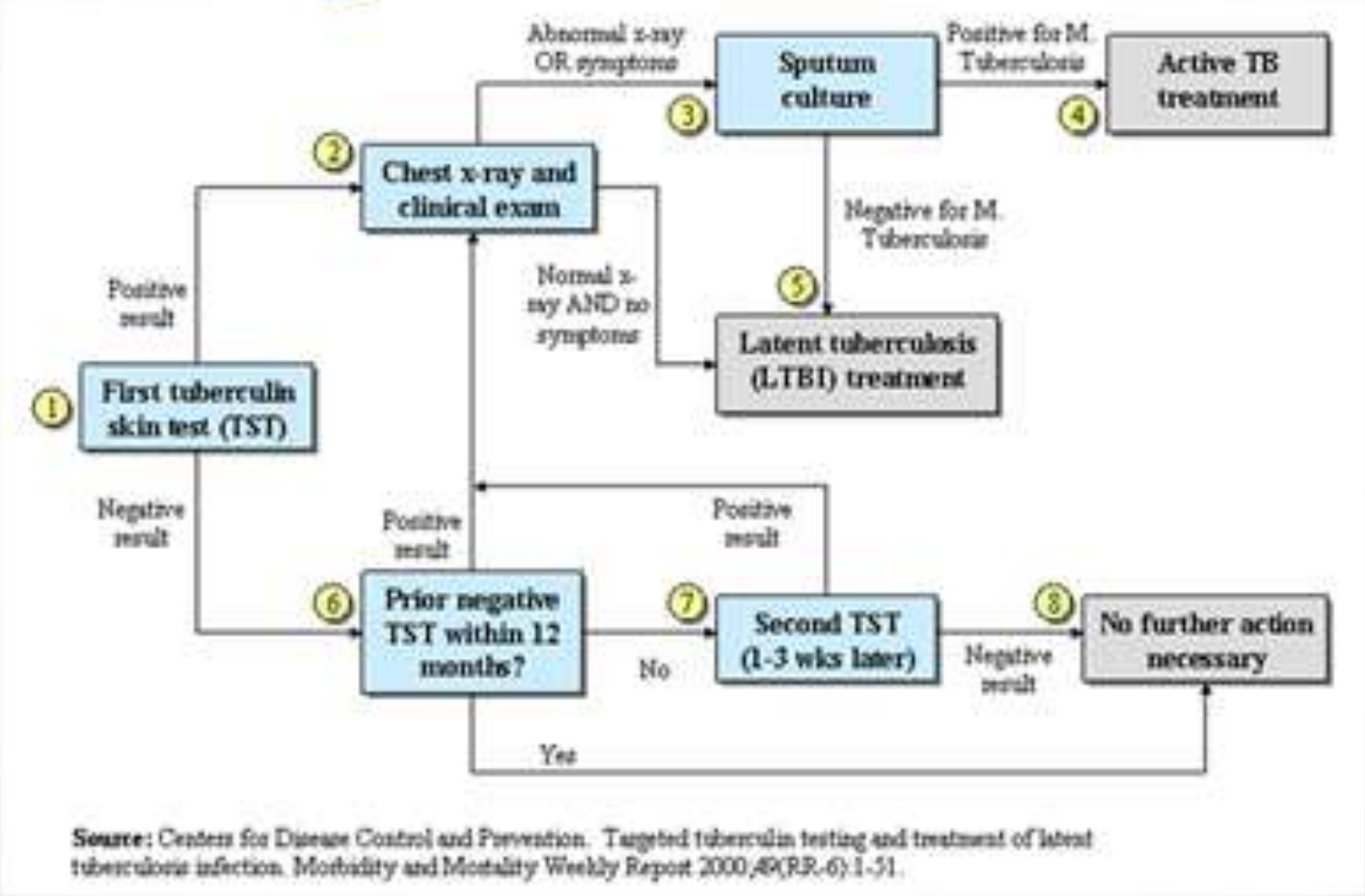
Administrative Controls cont.

- **Test and evaluate HCWs for TB**

TB Screening Classification: HCWs

- **Low risk**
  - → 2 step TST on hire
  - → annual testing not needed unless exposure occurs
  - → + TST: CXR recommended
- **Medium risk**
  - → 2 step TST on hire
  - → annual testing if negative; symptom survey if history of positive TST
  - → + TST: CXR recommended if new positive, then annual symptom survey; RX
- **Potential ongoing transmission**
  - → testing every 6-8 weeks until lapses in infection control corrected and ongoing transmission not apparent
  - → temporary; at most a year
- **IGRA**: if history of + TST/BCG

2 Step TST Flowchart



Source: Centers for Disease Control and Prevention. Targeted tuberculin testing and treatment of latent tuberculosis infection. Morbidity and Mortality Weekly Report 2000;49(RR-6):1-51.

Conversions

- Previous – TST increasing 10mm or > within 2 years
- Contacts: TST previously <5mm now ≥ 5mm
- Do not count indeterminate QFT-G
- Presumptive evidence of LTBI

Annual conversion rate =

$$\frac{\text{Total \# (except new hires) with newly positive TST results}}{\text{Total \# (except new hires) who had TSTs applied \& read}}$$

Administrative Controls cont.

- Implement effective work practices for managing TB patients
- Timely availability of lab testing & reporting
- Educate HCWs about TB infection control

→ where to get a copy of the plan & employer/employee roles

→ groups at risk for occupational TB

→ modes of transmission & symptoms of TB

→ TB screening and treatment for LTBI

→ MDR TB

→ procedure for isolating pts. with suspected / known infectious TB

→ administrative, engineering and PPE; reuse & disposal of respirators

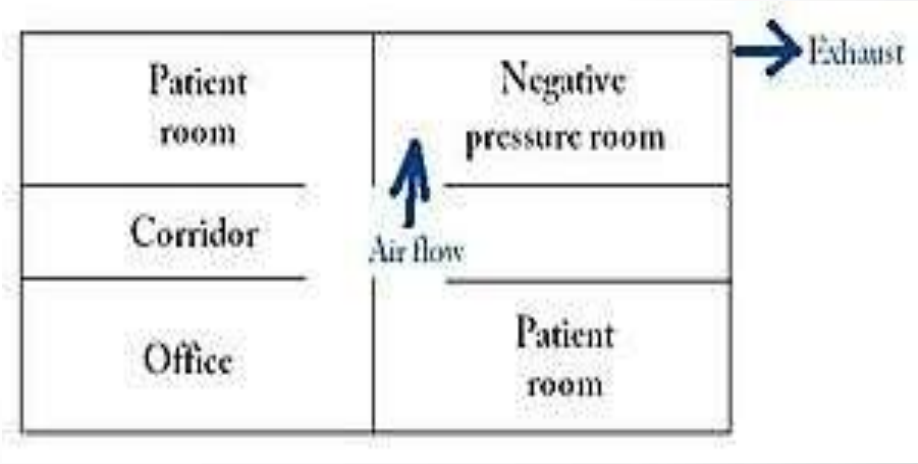
Administrative Controls cont.

- Ensure proper cleaning of equipment
- Use signage for respiratory etiquette & hygiene
- Quality Improvement

Engineering Controls

ISOLATION

- Facilities with All Rooms
  - → Control source of infection
  - → Dilute and remove contaminated air
  - → Control airflow (clean air to less clean air)
  - → Signage
  - → Supplies
  - → Education of pt/visitors

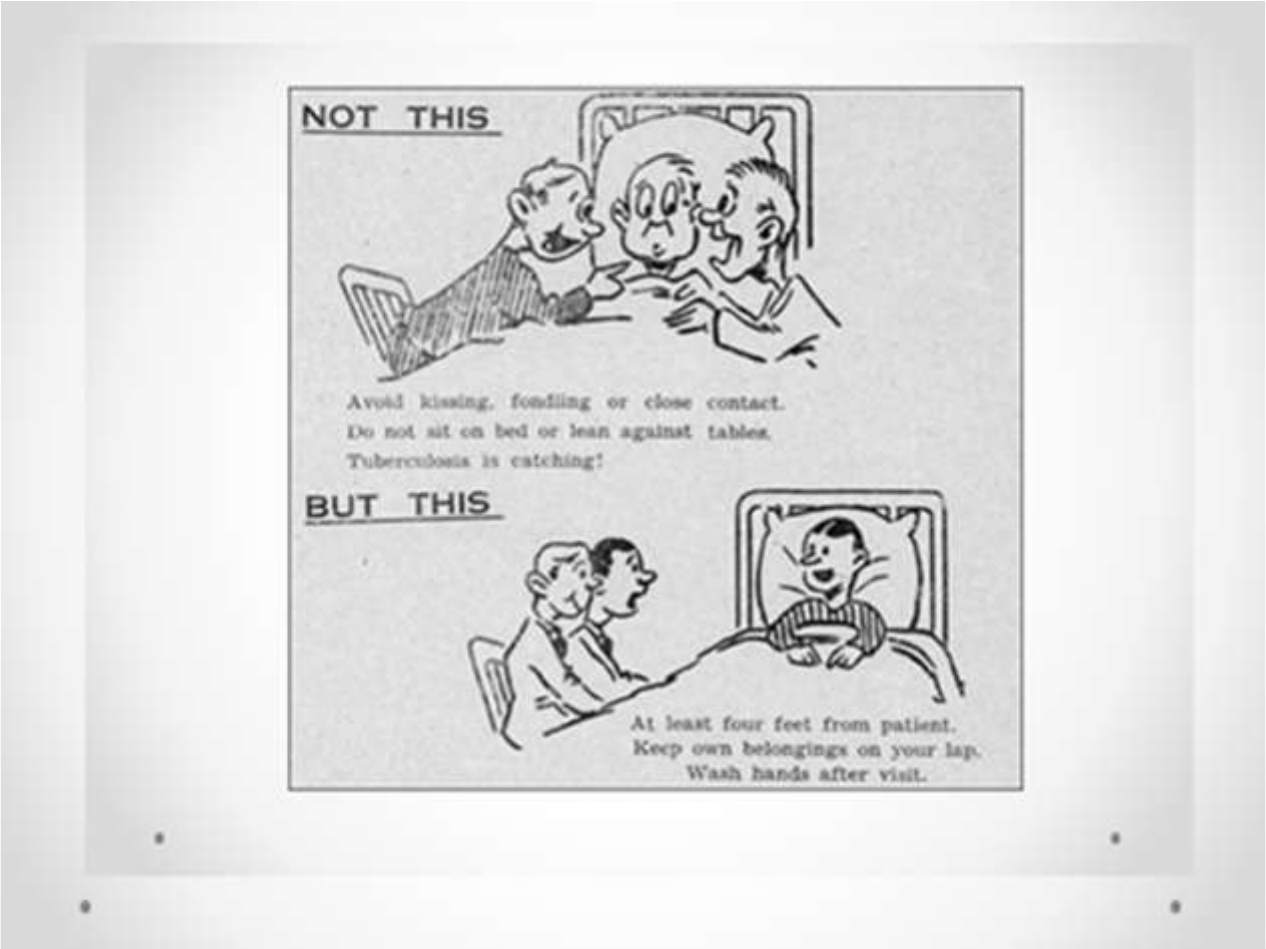


Engineering Controls cont.

- Home Isolation
  - → CT standard of care
  - → ventilation
  - → visitors
- TB Control Laws
  - → plan of care
  - → Isolation/Quarantine

Respiratory Protection Controls

- Implement *effective* respiratory program



Respiratory Protection Controls cont.

- Train HCWs in respiratory program
  → program administrator
  → SOP for selection, use & care of respirators
  → medical screening for respirator
  → annual training of HCW on prevention, transmission & symptoms
  → selection of respirator approved by CDC/NIOSH
  → fit testing
  → inspection & maintenance of respirators
  → periodic evaluation of program
- Train patients in respiratory hygiene

Management of Suspect/Confirmed Cases

- Key to prevention/interruption of transmission of TB
  → high index of suspicion
  → rapid implementation of precautions
- Triage
  → medical history/evaluation
  → consider TB with respiratory sx; cough > 3 weeks, wt. loss night sweats, hemoptysis, hoarseness, fever, fatigue
  → where are they from?
  → immunocompromised, especially HIV +

Management of Suspect/Confirmed Cases cont.

- Airborne precautions: All room (airborne infection isolation)
- If no All rooms:

  → provide surgical mask to patient/resident

  → place in private room; close door

  → transfer to hospital; alert ambulance to wear N-95

- Discontinue precautions

  → another diagnosis made

  → 3 consecutive negative AFB sputum smears collected in 8 – 24 hour intervals with at least1 early morning sputum

Infectiousness

- More likely to be infectious if:
  → have TB of the lungs or larynx; cavity in lung
  → coughing or undergoing cough-inducing procedures
  → AFB on sputum smear
  → not receiving adequate treatment
- Exposure time, proximity & concentration
- Determining Infectious Period

When Not Infectious?

- Conservative: hospitals/corrections
  → 3 consecutive – AFB smears 8-24 hrs apart and,
  → clinical improvement and,
  → minimum of 2 weeks of treatment
- Less conservative : not used for susceptible contacts or congregate settings
  → min. of 2 weeks of treatment w/ known susceptibilities and,
  → clinical improvement and,
  → decrease in grade of smear positivity

Preventing Outbreaks

- Know risk factors for progression of LTBI to Active TB
- Appropriate treatment
- Contact investigation
- DOT

Factors contributing to 27 CDC–investigated TB outbreaks, United States, 2002–2008*

Factor	No. outbreaks†
Prolonged infectious period	24
Provider related	
Delayed diagnosis	12
Inappropriate treatment	2
Patient related	
Delayed diagnosis because of lateaccess to care	6
Nonadherence with treatment	5
Mistrust or fear of public health system	6
Incomplete contact investigation	10
Crowded setting with high-risk population	7

Summary

TB stages and risk factors

1. Infectious cases of TB in the community
2. Exposure time, proximity and concentration
3. Endogenous factors, such as HIV
4. Severity of disease, delay in diagnosis, age