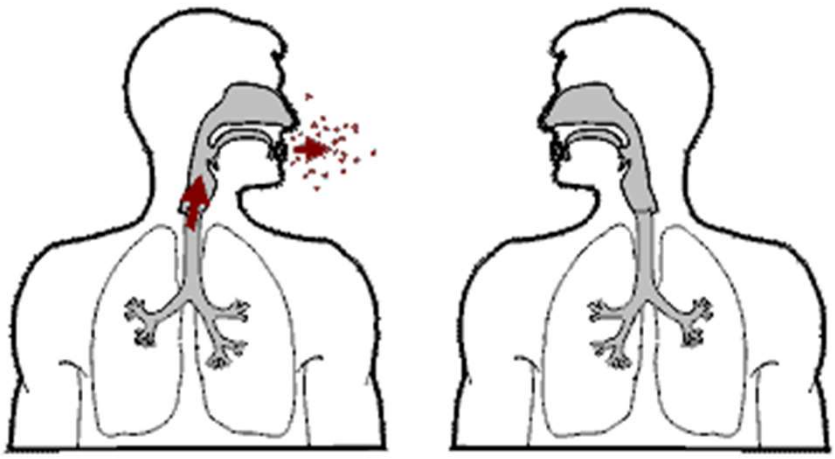
North Carolina SPICE Statewide Program for Infection Control & Epidemiology

TB CONTROL IN HEALTHCARE FACILITIES: A PRACTICAL GUIDE FOR PREVENTION

Marty Cooney, DrPh, MPH, ME, BSN, RN, CIC
Associate Director SPICE
https://spice.unc.edu/
https://spice.unc.edu/ask-spice/

1

HOW TB IS SPREAD



2

DROPLET FATE

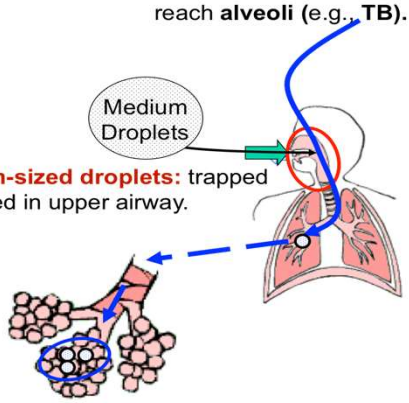
Smallest droplets (<25 mm) evaporate leaving "**droplet nuclei**" of bacilli that can reach **alveoli** (e.g., **TB).**

Medium Droplets

Medium-sized droplets: trapped & cleared in upper airway.

Largest droplets fall to ground in seconds; may persist in dust, but not an important cause of infection.

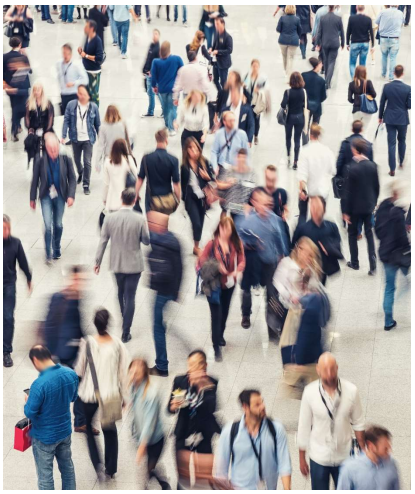
Largest Droplets



3

MYCOBACTERIUM TUBERCULOSIS

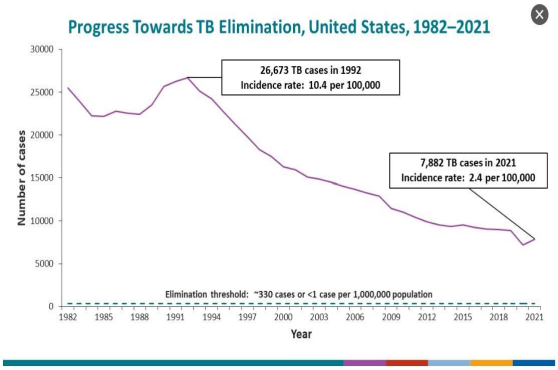
- Epidemiology
  - TB is one of the most common infections in the world
  - Nearly 2 billion people (1/4th of the worlds population) are infected with TB
  - Every year about 10 million people develop TB disease
  - 1.6 million die
  - 2015- the World Health Organization (WHO) reported TB disease as the leading cause of death due to infectious disease in the world



4

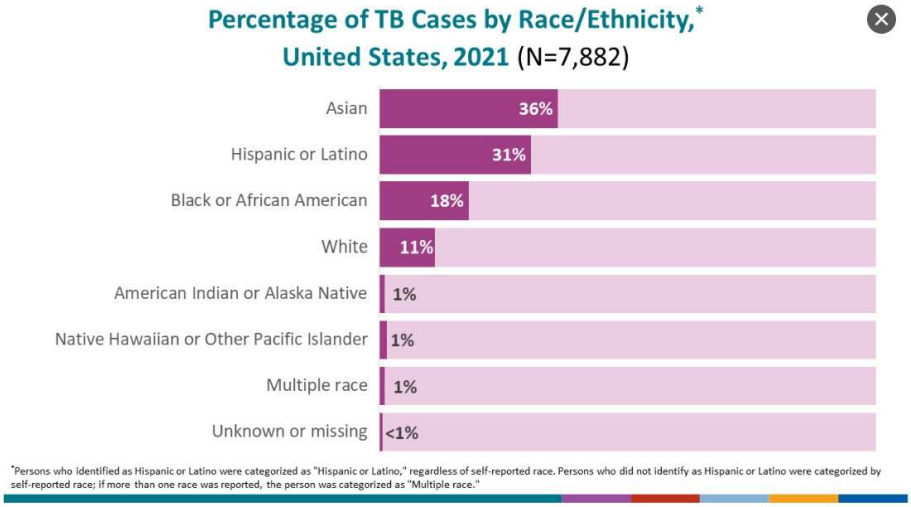
MYCOBACTERIUM TUBERCULOSIS

- Incidence
  - In 2022 the U.S. reported an incidence of 2.5 cases per 1,00,000 population (8,300)-slight increase from 2021
  - Steady decreases since 1992
  - 0.2 deaths per 100,000 persons (526) TB related deaths-2019



SPICE

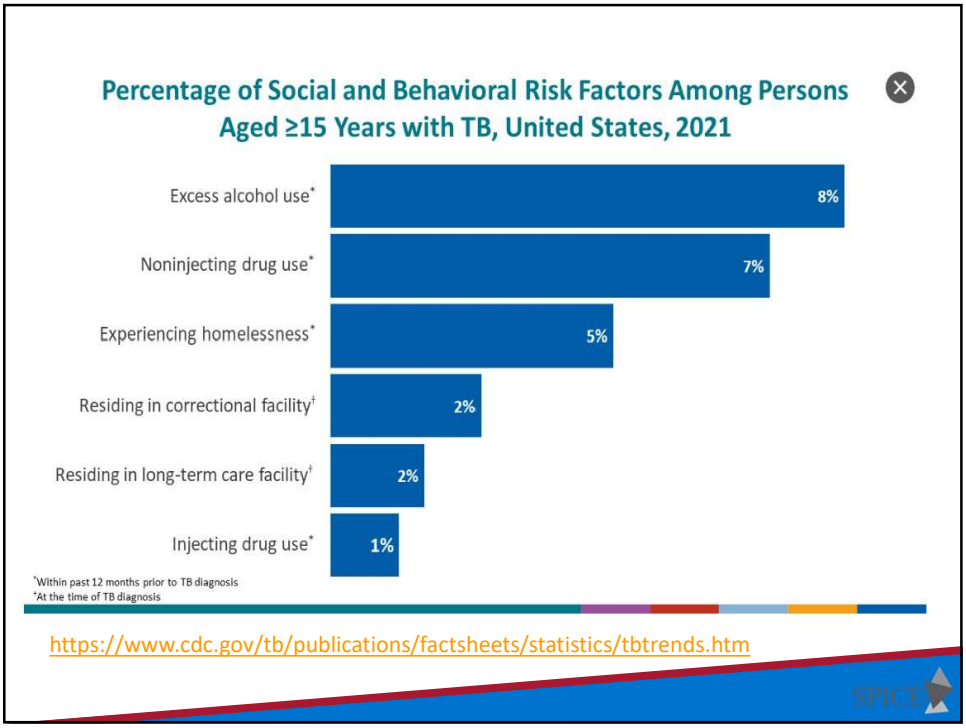
5



https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/TB-in-the-US-508.pdf

SPICE

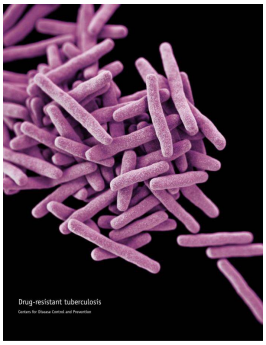
6



https://www.cdc.gov/tb/publications/factsheets/statistics/tbtrends.htm

7

- [1]Despite this decline ongoing concerns exist-
- TB cases reported in almost every state
- >80% of U.S. TB cases are believed to be associated with longstanding, untreated latent TB infection
- > than 2/3 of cases in the U.S. are among non-U.S.-born persons
- Affects racial/ethnic minorities disproportionately
- Drug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB) remain a serious public health issue-2020 a total of 56 cases[2]



[1]**Self-Study Modules on Tuberculosis Modules 2 Epidemiology of Tuberculosis**

[2]https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/TB-in-the-US-508.pdf

8

FACTORS DETERMINING TRANSMISSION

FACTOR	DESCRIPTION
Susceptibility	Immune status of the exposed individual
Infectiousness	Directly related to number of bacilli expelled into the air. Individuals who expel many bacilli are more infectious than those that expel few or no bacilli.
Environment	Factors that affect the concentration of bacilli in the air (ventilation, circulation, air pressure, etc)
Exposure	Proximity, frequency and duration of exposure

9

PATIENT CHARACTERISTICS ASSOCIATED WITH INFECTIOUSNESS

Factor	Description
Clinical	• Persistent cough > 3 weeks • Respiratory tract disease, especially laryngeal disease (highly infectious) • Failure to cover cough/sneeze • Inadequate/Inappropriate treatment
Procedure	Undergoing cough-inducing or aerosol-generating procedure (e.g., bronchoscopy, sputum induction)
Radiographic and Laboratory	• Cavitation on CXR • Positive culture Mtb • Postive AFB smear

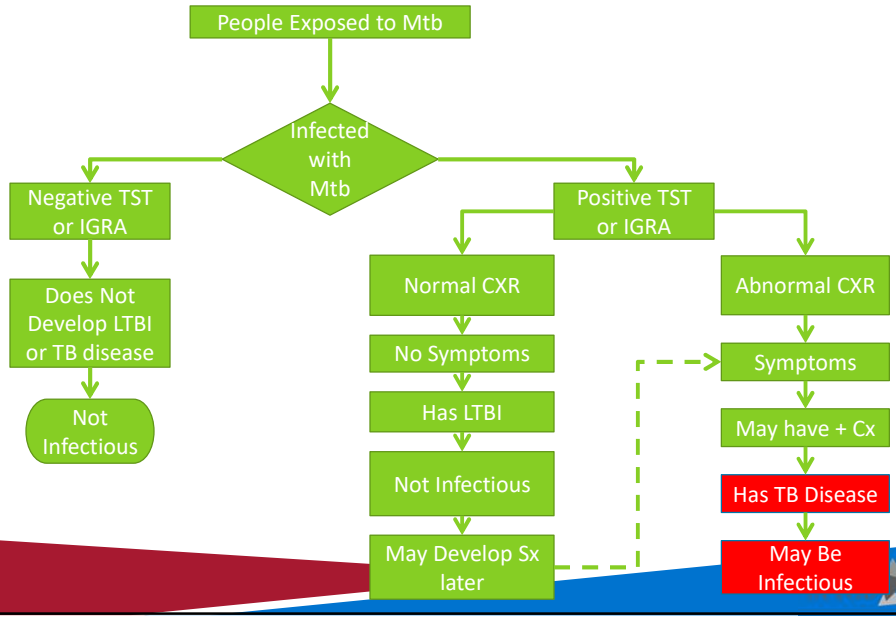
10

ENVIRONMENTAL FACTORS - INCREASE TRANSMISSION

Factor	Description
Concentration of droplet nuclei	The more droplet nuclei in the air, the more probable that Mtb will be transmitted
Space	Exposure in small, enclosed spaces
Air Circulation	Recirculation of air containing droplet nuclei
Air Pressure	Positive air pressure in infected patients room causes droplet nuclei to flow to other areas

11

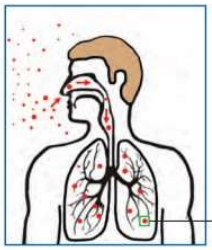
PROGRESSION OF TB



12

Figure 2.3
Pathogenesis of LTBI and TB Disease

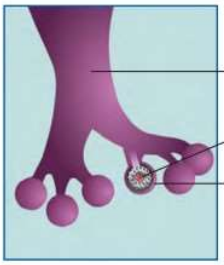
1.



Area of detail for boxes 2, 4, and 5

Droplet nuclei containing tubercle bacilli are inhaled, enter the lungs, and travel to the alveoli.

2.



Bronchiole

Tubercle bacilli

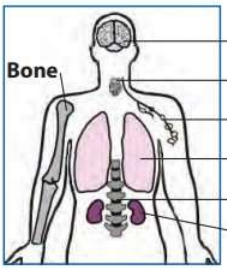
Alveoli

Tubercle bacilli multiply in the alveoli.

SPICE

13

3.



Bone

Brain

Larynx

Lymph node

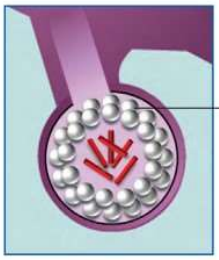
Lung

Spine

Kidney

A small number of tubercle bacilli enter the bloodstream and spread throughout the body. The tubercle bacilli may reach any part of the body, including areas where TB disease is more likely to develop (such as the brain, larynx, lymph node, lung, spine, bone, or kidney).

4.



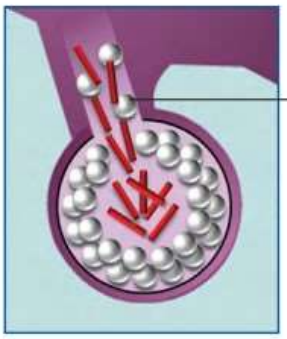
Special immune cells form a barrier shell (in this example, bacilli are in the lungs)

Within 2 to 8 weeks, special immune cells called macrophages ingest and surround the tubercle bacilli. The cells form a barrier shell, called a granuloma, that keeps the bacilli contained and under control **(LTBI)**.

SPICE

14

5.



Shell breaks down and tubercle bacilli escape and multiply

If the immune system **cannot** keep the tubercle bacilli under control, the bacilli begin to multiply rapidly (**TB disease**). This process can occur in different areas in the body, such as the lungs, kidneys, brain, or bone (see diagram in box 3).

Infection occurs when a person inhales droplet nuclei containing tubercle bacilli that reach the alveoli of the lungs.

SPICE

15

INFECTION VERSUS DISEASE

LATENT TB INFECTION

- Infected with TB but do not have disease
- Usually have a positive skin test
- Negative chest x-ray and a negative sputum test
- Do not feel sick
- Cannot spread TB to others-needs treatment-refer to local health department
- Staff can work

TB DISEASE

- Symptomatic with unexplained weight loss, loss of appetite, night sweats, fever, chills and fatigue
- Cough for 3 weeks or longer and coughing up blood
- Can spread disease and should not work-until approved to return by local health department

Without treatment approximately 5% of persons will develop disease in the first year or 2 after infection and another 5% sometime late in life (latent TB)

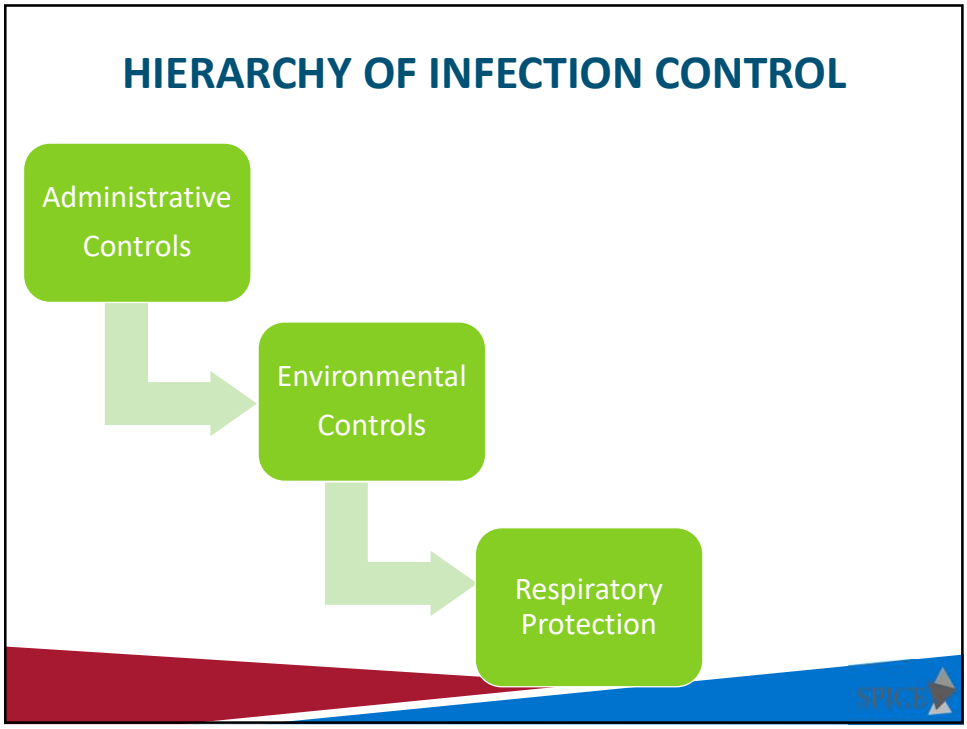
SPICE

16

INFECTION CONTROL FUNDAMENTALS

17

HIERARCHY OF INFECTION CONTROL



18

TB INFECTION CONTROLS - SIMPLIFIED

Administrative – WHO?

- Who is a suspect TB patient?
- Who is at risk from exposure?
- Who has infectious TB?

Environmental – WHERE?

- Where is the optimal place to minimize risk?

Personal Respiratory Protection – HOW?

- How can the worker minimize risk of exposure?

19

ADMINISTRATIVE CONTROLS

- Assign responsibility for TB IC Plan
- Conduct TB risk assessment
- Develop written TB IC Plan
- Provide TB screening for HCPs
- Train HCPs about TB IC
- Use appropriate signage
- Train about Respiratory hygiene and cough etiquette

20

ENVIRONMENTAL CONTROLS

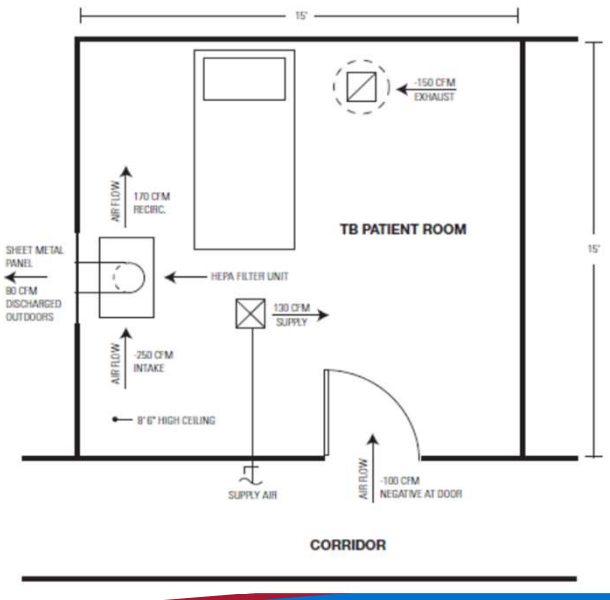
- Control source of infection
- Dilute and remove contaminated air
- Control Airflow and Pressure
  - Keep infectious air moving outside
  - Keep HCPs "upwind" and infectious patients "downwind"

Solution to pollution is dilution

VENTILATION system

21

AIRBORNE INFECTIOUS ISOLATION ROOM (AIIR)



Negative Pressure

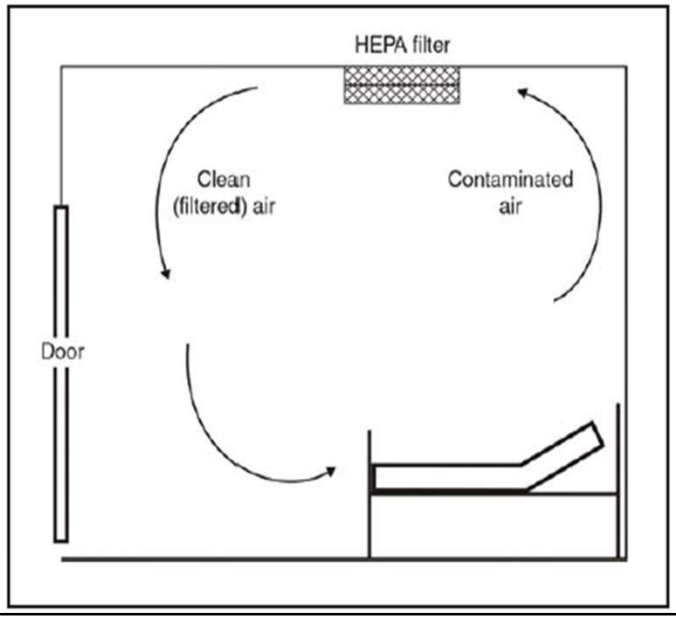
- Clean air flows from corridor into AII room
- Air cannot escape AII room
- Air is exhausted outdoors

Technical Requirements:

- 6-12 Air Changes/hr
- Must be constantly monitored for negative pressure
- Exhaust grills located above bed

22

HEPA Filters



Remove droplet nuclei from air

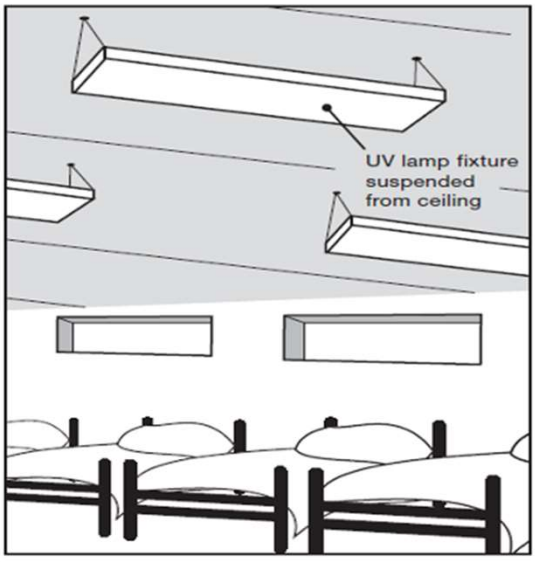
Must be used with releasing air from:

- Local exhaust ventilation booth to surrounding areas
- All rooms to general ventilation system

SPICE

23

UVGI



- Air cleaning technology that consist of UV lamps, which kill TB bacilli
- Should be used with other measures
- UV light can be harmful to skin and eyes

SPICE

24

RESPIRATORY PROTECTION STANDARD

1910.134(a)(2)

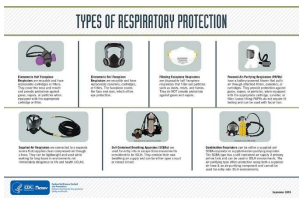
- A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program, which shall include the requirements outlined in paragraph (c) of this section. The program shall cover each employee required by this section to use a respirator.

https://www.cdc.gov/niosh/topics/respirators/default.html

25

KEY ELEMENTS OF A RESPIRATORY PROTECTION PROGRAM (RPP)

- Assign a suitably trained program administrator
  - Infection Preventionist
  - Nurse Administrator
  - Consult with a local industrial hygiene consulting service
- Implement and maintain a written RPP
  - Medical evaluation-Physician or other licensed health care professional (PLHCP)
  - Fit testing
  - Training
  - Maintenance



26

MEDICAL EVALUATION
1910.134(E)(1)

- The employer shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.
  - Physician or other licensed health care professional (PLHCP)
    - Perform medical evaluations using a medical questionnaire or an initial medical exam that contains the same information
  - Follow –up exam for employees providing a positive response (include test, consultations or diagnostic procedures)
  - Administered confidentially:
    - During employee's normal work hours,
    - At a time and place convenient to the employee and
    - Administered in a manner that ensures the employee understands content
  - Employee provided the opportunity to discuss with the PLHCP.

27

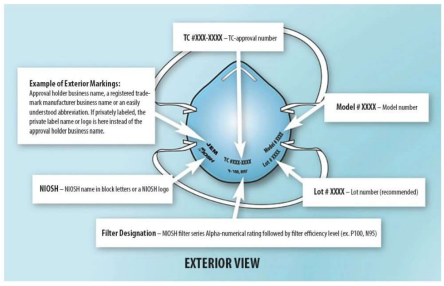
SUPPLEMENTAL INFORMATION TO PLHCP
1910.134(E)(5)

- The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:
  - The type and weight of the respirator
  - The duration and frequency
  - The expected physical work effort
  - Additional protective clothing and equipment to be worn and
  - Temperature and humidity extremes that may be encountered
  - Copy of the respiratory protection program and a copy of this section
- Employer shall:
  - Obtain a written recommendation from the PLHCP
    - Any limitations on respirator use, any needed medical follow up and a statement that the employee has been provided a copy

28

SELECTION OF RESPIRATORS
1910.134(D)

Sample of a generic filtering facepiece respirator with appropriate markings.



- The employer shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed
- The employer shall select a NIOSH-certified respirator
- The employer shall select respirators from enough models and sizes

https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/default.html

29

FIT TESTING
1910.134(F)

- Before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used.
  - Pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT)
  - Fit tested prior to initial use, whenever a different respirator is used, and at least annually
  - Whenever changes in the employee's physical condition that could impact fit occur-dental changes, cosmetic surgery or obvious change in body weight

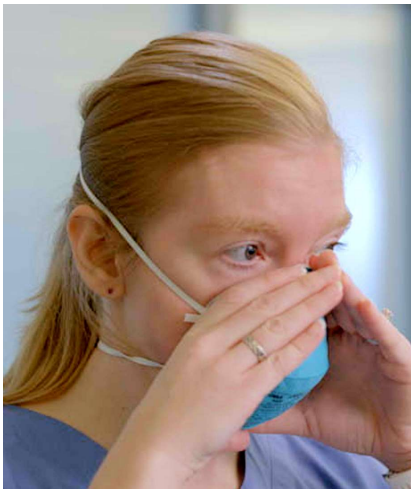
30

FIT TESTING
1910.134(F)

- Cannot be worn by employees who have:
  - Facial hair that comes between the sealing surface of the facepiece and the face
  - Any condition that interferes with seal
  - Other PPE will not interfere with seal
  - A user seal check is performed each time they put on the respirator

31

USER SEAL CHECK



- **User seal check is not a fit test.** The user seal check is one step an employee must take before any fit testing is performed and before the employee uses the respirator in the workplace.

32

FIT TESTING

QUALITATIVE FIT TESTING

- Qualitative fit testing is a non-numeric pass/fail test that relies on the respirator wearer's response to a substance ("test agent") used in the test to determine respirator fit.
- Performs a user seal check-enclosed area-test agent used

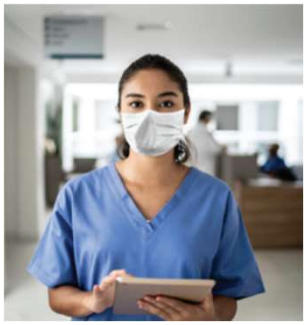
QUANTITATIVE FIT TESTING

- Quantitative fit testing is a method of measuring the amount of leakage into a respirator. A numeric assessment of how well a respirator fits a particular individual.
- Performs a user seal check
- Connected to a machine that measures the leakage

33

TRAINING
1910.134(K)

- This paragraph requires the employer to provide effective training to employees who are required to use respirators.
- The training must be comprehensive, understandable, and recur annually, and more often if necessary.
- This paragraph also requires the employer to provide the basic information on respirators in Appendix D of this section to employees who wear respirators when not required by this section or by the employer to do so (voluntary use)



34

KEY ELEMENTS OF A RESPIRATORY PROTECTION PROGRAM

- Provide effective training
  - Why it is necessary
  - Limitations
  - How to inspect, put on and remove
  - How to recognize medical signs and symptoms that may limit effective use
  - Prior to use
  - Annually
- Conduct periodic evaluations
  - Solicit input from staff

35

WHEN A RESPIRATOR IS NOT REQUIRED 1910.134(C)(2)

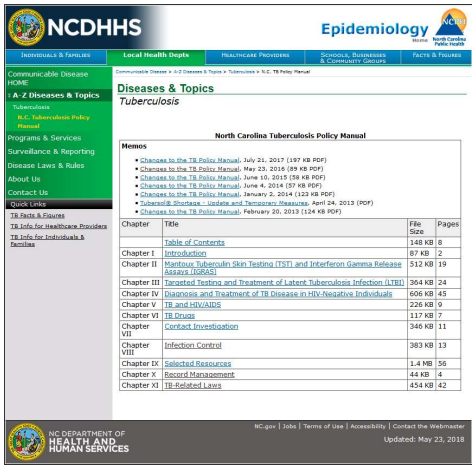
- An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard. If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in Appendix D to this section *("Information for Employees Using Respirators When Not Required Under the Standard");* and
- In addition, the employer must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user.
- **If filtering facepiece respirators are the only respirator being worn voluntarily, employers are only required to provide the employee with a copy of *Appendix D* and make sure that the respirator itself is not creating a hazard, such as dermatitis from a dirty respirator.**

36

OTHER ELEMENTS

- Program evaluation
- Recordkeeping
  - Medical Evaluation
    - Records of medical evaluations must be retained and made available in accordance with 29 CFR 1910.1020
  - Fit testing
    - Name or identification of the employee
    - Type of test performed
    - Specific make, model, style and size of respirator tested
    - Date of test
    - Pass/fail results of fit testing
    - Retain until the next fit test is administered
    - A written copy of the current respirator program shall be retained by the employer

37



TB RISK ASSESSMENT

http://epi.publichealth.nc.gov/cd/lhds/manuals/tb/toc.html

38

TB RISK ASSESSMENT
SETTINGS EXPECTING TO ENCOUNTER TB PATIENTS

- Review Community TB profile
- Review number of TB patients encountered
- Determine which HCPs to include in both TB screening and RP program
- Assess the number of AIIR needed
- Determine types of environmental controls needed

39

TB RISK ASSESSMENT

- Reviewing number of cases
  - National → State → County → Facility
- Determining your risk classification
  - Low
    - No TB cases; <200 beds & < 3 active TB cases; >200 beds & <6 active TB cases-
    - Persons with TB disease not expected to be encountered; exposure unlikely
  - Medium
    - <200 beds & > 3 active TB cases; >200 beds & > 6 active TB cases
    - HCP will or might be exposed to persons with TB disease
  - Potential Ongoing Transmission
    - Evidence of ongoing transmission in facility

(No longer used to determine frequency that HCP should be tested)

40

TB SCREENING, TESTING AND TREATMENT OF U.S. HEALTH CARE PERSONNEL *(CDC RECOMMENDATIONS 2019)*

- U.S. healthcare personnel should be screened for TB upon hire (i.e., preplacement)
- TB screening includes a process that includes:
  - A baseline individual TB risk assessment (2019 updated recommendations)
  - TB symptom evaluation
  - A TB test (e.g., TB blood test or a TB skin test) and
  - Additional evaluation for TB diseased as needed

Figure 3.1 Health care worker collecting a blood

SPICE

41

BOX. Indicators of risk* for tuberculosis (TB) at baseline health care personnel assessment†

Return

Health care personnel should be considered to be at increased risk for TB if they answer "yes" to any of the following statements.

1. Temporary or permanent residence (for ≥1 month) in a country with a high TB rate (i.e., any country other than Australia, Canada, New Zealand, the United States, and those in western or northern Europe)

Or

2. Current or planned immunosuppression, including human immunodeficiency virus infection, receipt of an organ transplant, treatment with a TNF-alpha antagonist (e.g., infliximab, etanercept, or other), chronic steroids (equivalent of prednisone ≥15 mg/day for ≥1 month), or other immunosuppressive medication

Or

3. Close contact with someone who has had infectious TB disease since the last TB test

Abbreviation: TNF = tumor necrosis factor.

* Individual risk assessment information can be useful in interpreting TB test results. (Lewinsohn DM, Leonard MK, LoBue PA, et al. Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention clinical practice guidelines: diagnosis of tuberculosis in adults and children. Clin Infec Dis 2017;64:111–5). https://academic.oup.com/cid/article/64/2/111/2811357

† Adapted from a tuberculosis risk assessment form developed by the California Department of Public Health.

SPICE

42

Category	2005 Recommendation	2019 Recommendation
Baseline (preplacement) screening and testing	TB screening of all HCP, including a symptom evaluation and test (IGRA or TST) for those without documented prior TB disease or LTBI.	TB screening of all HCP, including a symptom evaluation and test (IGRA or TST) for those without documented prior TB disease or LTBI **(unchanged)**; individual TB risk assessment **(new)**.
Postexposure screening and testing	Symptom evaluation for all HCP when an exposure is recognized. For HCP with a baseline negative TB test and no prior TB disease or LTBI, perform a test (IGRA or TST) when the exposure is identified. If that test is negative, do another test 8–10 weeks after the last exposure.	Symptom evaluation for all HCP when an exposure is recognized. For HCP with a baseline negative TB test and no prior TB disease or LTBI, perform a test (IGRA or TST) when the exposure is identified. If that test is negative, do another test 8–10 weeks after the last exposure **(unchanged)**.
Serial screening and testing for HCP without LTBI	According to health care facility and setting risk assessment. Not recommended for HCP working in low-risk health care settings. Recommended for HCP working in medium-risk health care settings and settings with potential ongoing transmission.	Not routinely recommended **(new)**; can consider for selected HCP groups **(unchanged)**; recommend annual TB education for all HCP **(unchanged)**, including information about TB exposure risks for all HCP **(new emphasis)**.
Evaluation and treatment of positive test	Referral to determine whether LTBI treatment is indicated.	Treatment is encouraged for all HCP with untreated LTBI, unless medically contraindicated **(new)**.

SPICE

43

NORTH CAROLINA SPECIFIC RULES

2. Tuberculin Skin Testing (TST) may be required by agency rules or OSHA; if OSHA guidelines apply or annual testing is being done by policy, a two-step test or IGRA should be done at the time of hire

- **hospital employees**
  By: OSHA
  Frequency: upon employment & by risk assessment
- **operating room employees**
  By: OSHA
  Frequency: upon employment & by risk assessment
- **autopsy room employees**
  By: OSHA
  Frequency: upon employment & by risk assessment
- **mycobacteriology laboratory employees**
  By: OSHA
  Frequency: upon employment & by risk assessment
- **employees of ambulatory facilities that perform high hazard procedures on suspected or active tuberculosis patients**
  By: OSHA
  Frequency: upon employment & by risk assessment
- **emergency medical personnel with direct patient contact**
  By: OSHA
  Frequency: upon employment & by risk assessment

SPICE

44

NORTH CAROLINA SPECIFIC RULES

- A 2-step TST or IGRA is provided free of charge to new employees who cannot provide a documented negative TST or IGRA within the preceding twelve months
- Those who provide a documented negative TST within the preceding twelve months receive a single TST and this result is considered the second part of the two-step test.
- Those who provide documentation of having had a negative 2-step at any time receive a single TST at time of hire.

Figure 3.2 Administering the Mantoux TST.

https://epi.publichealth.nc.gov/cd/lhds/manuals/tb/toc.html

45

TB TESTING

- Perform an IGRA rather than a TST in individuals 5 years or older who meet the following criteria:
  - Are likely to be infected with Mtb
  - Have a low or intermediate risk of disease progression
  - Testing for LTBI is warranted
  - History of BCG vaccination
  - Person unlikely to return for TST to be read (at the appropriate time
- Perform TST rather than an IGRA:
  - In healthy children < 5 years of age for whom it has been decided that diagnostic testing for LTBI is warranted

Recommendations from the American Thoracic Society/Infectious Disease Society of America/CDC

46

TB TESTING

Table 3.4 – Advantages of using an IGRA compared to using the TST.

IGRA	TST
Requires one patient visit to conduct the test	Requires at least two patient visits to conduct the test
Results can be available in 24 hours	Results are available 48 to 72 hours later
Does not cause booster phenomenon	Can cause booster phenomenon
Previous BCG vaccination does not cause false-positive result	Previous BCG vaccination may cause false-positive result

https://www.cdc.gov/tb/education/ssmodules/pdfs/Module3.pdf

47

OCCUPATIONAL EXPOSURE EVALUATION

- HCP and other exposed persons screened by symptoms and TST or IGRA as soon as possible after exposure
- Follow-up testing repeated in 8-10 weeks following exposure, if initial result negative
- Treatment is encouraged for all HCP with untreated LTBI, unless medically contraindicated.

48

MANAGING TB PATIENTS

49

PROMPT TRIAGE

- Primary risk is patient with undiagnosed/unrecognized TB
- Initiate Airborne Infection Isolation (AII) and manage/transfer patients with suspected/confirmed TB
  - Ask about and evaluate for TB
  - Check for signs and symptoms
  - Mask symptomatic patients
  - Separate immunocompromised patients

50

CRITERIA FOR INITIATING AII PRECAUTIONS

- Know or suspected pulmonary, laryngeal or miliary (disseminated) TB disease
- Patients with known or suspected open/draining TB abscesses or have wound drains in place (JP)
- Gastric Aspirate (pediatrics only) culture positive for TB
- Rule out TB in differential diagnosis and AFB smears ordered
- Previously diagnosed smear-positive TB readmissions

https://epi.publichealth.nc.gov/cd/lhds/manuals/tb/toc.html

51

CRITERIA FOR DISCONTINUING AII PRECAUTIONS

- Sputum specimen results meet CDC criteria for discontinuation of respiratory isolation;
- Patient has 2 consecutive negative AFB smears collected at least 8 hours apart;
- It has been at least seven days since the last positive sputum smear and
- Patient has been compliant on TB medications to which the organism is susceptible and there is evidence of clinical response to treatment

https://epi.publichealth.nc.gov/cd/lhds/manuals/tb/toc.html Chapter XI

52

CDC CRITERIA FOR DISCONTINUING AII PRECAUTIONS

- Patients can be considered noninfectious when they meet **ALL** of the following three criteria
  - The patient has three consecutive, negative AFB sputum smear collected in 8–24-hour intervals and at least one specimen should be an early morning specimen
  - They are compliant with an adequate treatment regimen for two weeks or longer; and
  - Their symptoms have improved clinically

CDC recommendation on infection control provide evidence-based guidance. For regulations in your area refer to state and local regulations

https://www.cdc.gov/tb/publications/factsheets/prevention/ichcs.htm

53

AIRBORNE PRECAUTIONS

- Common conditions:
  - Tuberculosis,
  - Measles

Private room only

Room requires Negative airflow pressure

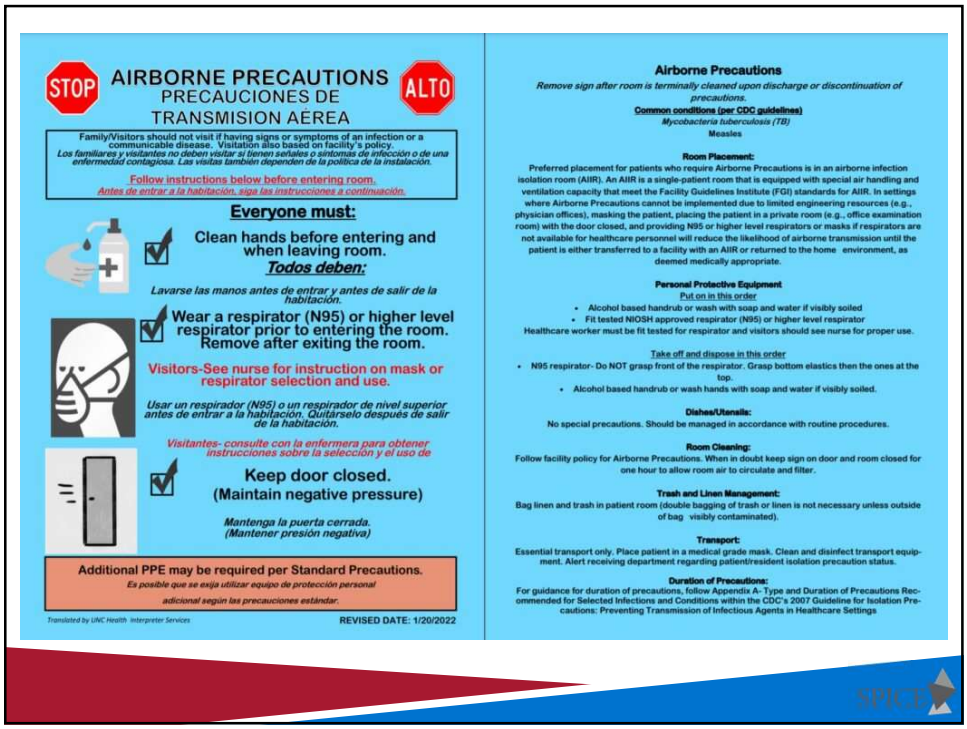
Doors must remain closed

Everyone must wear an N-95 respirator

Limit the movement and transport of the Resident

Hand hygiene before and after

54



STOP **AIRBORNE PRECAUTIONS** ALTO
PRECAUCIONES DE
TRANSMISION AÉREA

Family/Visitors should not visit if having signs or symptoms of an infection or a communicable disease. Visitation also based on facility's policy.
Los familiares y visitantes no deben visitar si tienen señales o síntomas de infección o de una enfermedad contagiosa. Las visitas también dependen de la política de la instalación.

Follow instructions below before entering room.
Antes de entrar a la habitación, siga las instrucciones a continuación.

Everyone must:

Clean hands before entering and when leaving room.
Todos deben:
Lavarse las manos antes de entrar y antes de salir de la habitación.

Wear a respirator (N95) or higher level respirator prior to entering the room. Remove after exiting the room.

Visitors-See nurse for instruction on mask or respirator selection and use.

Usar un respirador (N95) o un respirador de nivel superior antes de entrar a la habitación. Quítárselo después de salir de la habitación.

Visitantes- consulte con la enfermera para obtener instrucciones sobre la selección y el uso de

Keep door closed.
(Maintain negative pressure)

Mantenga la puerta cerrada.
(Mantener presión negativa)

Additional PPE may be required per Standard Precautions.
Es posible que se exija utilizar equipo de protección personal adicional según las precauciones estándar.

Translated by UNC Health Interpreter Services

REVISED DATE: 1/20/2022

Airborne Precautions

Remove sign after room is terminally cleaned upon discharge or discontinuation of precautions.

Common conditions (per CDC guidelines)
Mycobacteria tuberculosis (TB)
Measles

Room Placement:
Preferred placement for patients who require Airborne Precautions is in an airborne infection isolation room (AIIR). An AIIR is a single-patient room that is equipped with special air handling and ventilation capacity that meet the Facility Guidelines Institute (FGI) standards for AIIR. In settings where Airborne Precautions cannot be implemented due to limited engineering resources (e.g., physician offices), masking the patient, placing the patient in a private room (e.g., office examination room) with the door closed, and providing N95 or higher level respirators or masks if respirators are not available for healthcare personnel will reduce the likelihood of airborne transmission until the patient is either transferred to a facility with an AIIR or returned to the home environment, as deemed medically appropriate.

Personal Protective Equipment
Put on in this order
- Alcohol based handrub or wash with soap and water if visibly soiled
- Fit tested NIOSH approved respirator (N95) or higher level respirator

Healthcare worker must be fit tested for respirator and visitors should see nurse for proper use.

Take off and dispose in this order
- N95 respirator- Do NOT grasp front of the respirator. Grasp bottom elastics then the ones at the top.
- Alcohol based handrub or wash hands with soap and water if visibly soiled.

Dishes/Utensils:
No special precautions. Should be managed in accordance with routine procedures.

Room Cleaning:
Follow facility policy for Airborne Precautions. When in doubt keep sign on door and room closed for one hour to allow room air to circulate and filter.

Trash and Linen Management:
Bag linen and trash in patient room (double bagging of trash or linen is not necessary unless outside of bag visibly contaminated).

Transport:
Essential transport only. Place patient in a medical grade mask. Clean and disinfect transport equipment. Alert receiving department regarding patient/resident isolation precaution status.

Duration of Precautions:
For guidance for duration of precautions, follow Appendix A- Type and Duration of Precautions Recommended for Selected Infections and Conditions within the CDC's 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings

55

56

DISCHARGE CONSIDERATIONS

- Patient can be discharged without 3 negative sputum smears if
  - Follow-up plan and appointment has been made with local TB program
  - Patient is on standard treatment and directly observed therapy (DOT) is arranged
  - Does not reside in a congregate setting
  - No person in home <5 years old or immunocompromised
  - All in household previously exposed
  - Patient willing to stay home until sputum results negative
- Do not release if high-risk persons will be exposed

57

EVALUATING PROBLEMS

- Conduct contact investigations for problems such as
  - Conversion in TST or BAMT result in HCP
  - TB disease diagnosis in HCP
  - Suspected person-to-person transmission
  - IC lapses exposing HCPs
  - Possible outbreaks identified using automated lab systems

58

RESOURCES

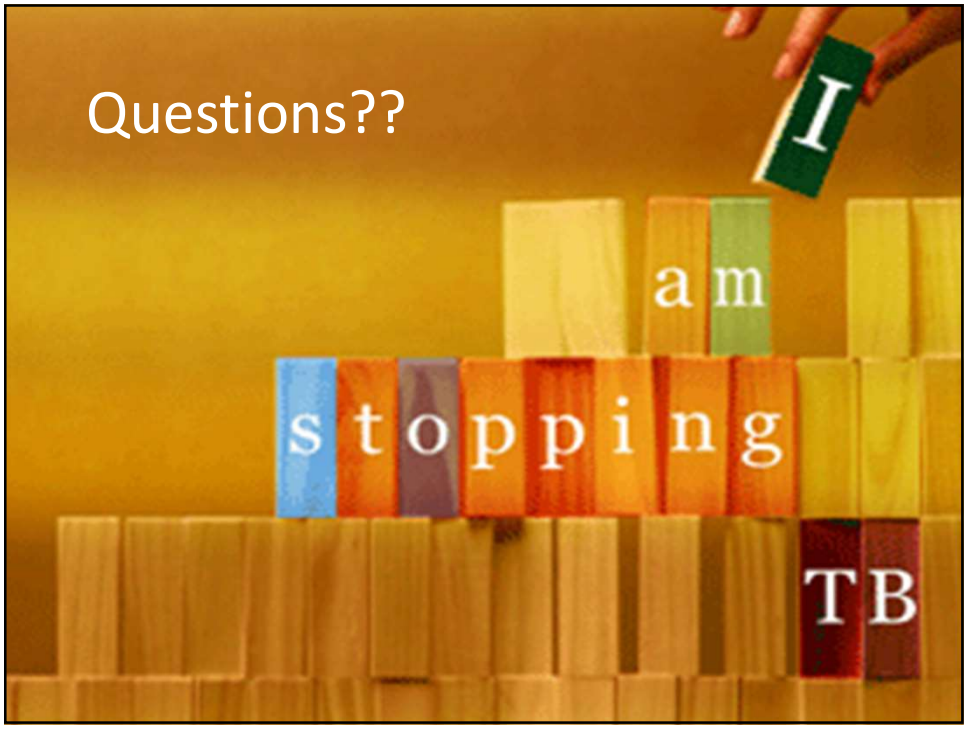
59

60

epi.publichealth.nc.gov/cd/lhds/manuals/tb/toc.html

SPICE

61



62