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VIRGINIA
# EPIDEMIOLOGY BULLETIN

*Robert B. Stroube, M.D., M.P.H., Health Commissioner*
*Carl W. Armstrong, M.D., State Epidemiologist*

*Christopher Novak, M.D., M.P.H., Editor*
*Vickie L. O'Dell, Layout Editor*

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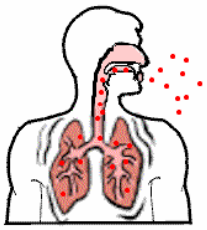
## Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Healthcare Settings, 2005

*Mycobacterium tuberculosis* is transmitted by airborne particles that can be generated when individuals who have pulmonary or laryngeal tuberculosis disease (TB) cough, sneeze, shout, or sing. The particles are approximately 1-5 µm; normal air currents can keep particles of this size airborne for prolonged periods and spread the organism throughout a room or building. Infection occurs when a susceptible person inhales these particles, enabling the organism to traverse the mouth or nasal passages, upper respiratory tract, and bronchi to reach the alveoli. After the organism reaches the alveoli, local infection may occur, followed by dissemination to draining lymphatics and hematogenous spread throughout the body. Infection with *M. tuberculosis* does not usually occur by contact with contaminated surfaces.[1]



As a result of improved nutrition, medications, and prevention programs, tuberculosis has declined as a cause of morbidity and mortality in Virginia. However, TB is not gone. In Virginia in 2005, 355 cases of tuberculosis were reported to the Virginia Department of Health (VDH), representing an 8% increase from 2004. While newcomers to Virginia account for approximately 60% of cases, the remaining 40% are U.S.-born and often reflect infection early in life with subsequent reactivation. This suggests that healthcare workers (HCWs) need to remain vigilant for tuberculosis in their patients, and need to consider appropriate testing and infection control measures to detect cases early and limit transmission.

The magnitude of the risk of exposure to *M. tuberculosis* in a healthcare setting depends on the environment, the occupational group(s) involved, the prevalence of TB in the community, the patient population, and the effectiveness of TB infection control measures. General methods for control include administrative, environmental, and respiratory-protection measures.[1]

In December, 2005, the Centers for Disease Control and Prevention (CDC)

***In This Issue:***

published updated guidelines for preventing the transmission of tuberculosis in healthcare settings. The report reflects shifts in the epidemiology of TB, advances in scientific understanding, and changes in healthcare practice that have occurred in the United States since the release of the original recommendations in 1994. The 2005 report emphasizes actions to eliminate the lingering threat to HCWs from patients or other persons with unsuspected and undiagnosed infectious TB disease. Issues addressed include:

- The scope of settings where the guidelines apply, to include any setting (physical or organizational) where persons work who might share airspace with persons with active TB or with specimens containing the mycobacteria. Some examples include laboratories, outpatient clinics, and nontraditional facility-based settings. The main criterion is the sharing of airspace, not the employment relationship or setting. Therefore, these guidelines are relevant for any category of worker, including contract, temporary, and volunteer;
- The frequency and criteria for testing HCWs for *M. tuberculosis* infection in various settings;
- The use of tuberculin skin tests (TSTs), as well as the use of blood assays for *M. tuberculosis* (BAMT) instead of TSTs, in TB screening programs for HCWs;
- Respirator training, and initial and periodic respirator fit testing, as well as evidence for the need for respirator fit testing;
- The use of ultraviolet germicidal irradiation (UVGI) and room-air recirculation units; and,
- Multi-drug resistant tuberculosis (MDR-TB) and HIV infection.

This issue of the *Virginia Epidemiology Bulletin* outlines some of the key information contained in the updated guidelines.

Tuberculin Skin Testing

## *Setting Assessment of Risk*

In general, the 2005 TB guidelines describe the need for each facility to have a written infection control plan, and the guidelines provide sample controls for various settings to assist facilities in developing their plan. Each facility or organization must also assess the risk, either for the facility as a whole or for individual sections or units within the facility. These should be reviewed on an annual basis to ensure that the assumptions underlying facility or unit screening/testing programs have not changed.

The results of the assessment enable facilities or their units to determine their risk classification as:

► **Low Risk**
- Inpatient settings with ≥ 200 beds **and** < 6 TB cases during the preceding year;
- Inpatient settings with < 200 beds **and** < 3 TB cases during the preceding year; and,
- Outpatient, outreach, and home-based settings with < 3 TB cases during the preceding year.

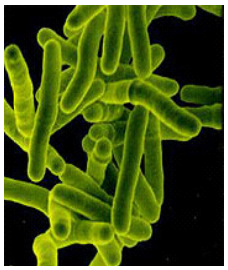
- If there are special characteristics of the workforce or population served, a medium risk classification could be considered for any low risk setting.

► **Medium Risk**
- Inpatient settings with ≥ 200 beds **and** ≥ 6 TB cases during the preceding year;
- Inpatient settings with < 200 beds **and** ≥ 3 TB cases during the preceding year; and,
- Outpatient, outreach, and home-based settings with ≥ 3 TB cases during the preceding year.

► **Potential Ongoing Transmission**
- A setting where there has been a known case or there is potential transmission as evidenced by documented conversions in the screening and testing program. More frequent testing may be needed in these settings. Following appropriate testing and implementation of controls to address the situation, the risk classification can return to low or medium risk.

**The term "tuberculin skin test" (TST) is now used instead of purified protein derivative (PPD) test**

These risk levels help to determine the appropriate testing frequency for staff. In general, all HCWs should receive baseline screening upon hire using either a two-step TST or single BAMT. In Low Risk Environments, additional screening/testing need only be done in response to a known exposure. In Medium Risk Environments, annual symptom screening should be done for all staff, in addition to testing for infection for those with negative baseline results. However, any healthcare worker symptomatic for TB should be evaluated immediately—testing does not have to wait for the "annual" screening.



## *Handling New Positives*

Facilities should have plans for the referral, evaluation, clearance, and treatment of employees with new positive reactions, as well as for the management of symptomatic employees. In particular, symptomatic employees should not be permitted to work until they are cleared. Every testing program should incorporate an analysis component: conversions are unexpected events and should trigger an investigation. Consultation with the local health department should occur whenever a TST conversion is detected in a HCW.

## *Respirator Fit Testing*

A respiratory protection plan is necessary if the facility or unit risk assessment shows a need. A respirator program has both a training component and a fit testing component. Of interest, the CDC's guidelines do not specify a frequency for testing. Instead, the guidelines state that facilities need to comply with federal, state, and local regulations. Federal regulations (29 CFR 1910.134) require annual fit testing for those that require a respirator. Fit testing is required for any use of respirators (e.g., for protec-

tion from measles/rubeola, Severe Acute Respiratory Syndrome, etc.), not just for TB protection.

### *Summary*

The CDC's 2005 guidelines for preventing the transmission of *Mycobacterium tuberculosis* in healthcare settings provide an updated resource for facilities to address tuberculosis. In addition to specific guidelines for planning, it provides resources to help facilities implement effective programs.

The complete report was released in the *Morbidity and Mortality Weekly Report* (Vol. 54 / No. RR-17) and is available at www.cdc.gov/mmwr/pdf/rr/rr5417.pdf. Continuing education credit [e.g., 3.5 hours of category 1 Continuing Medical Education (CME) credit] is available for reviewing the report and completing the exam.

Facilities or individuals who have questions or concerns about the control of tuberculosis in Virginia, including the implementation of the CDC guidelines, may contact Margaret Tipple, MD, or Jane Moore, RN, MHSA in VDH's Division of Disease Prevention (804-864-7906) for additional guidance.

*Submitted by: Jane Moore, RN, MHSA; Division of Disease Prevention, VDH*

**References**

1. Centers for Disease Control and Prevention. Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Healthcare Settings, 2005. *MMWR* 2005;54(No. RR-17).

Virginia Department of Health TB control resources can be found at: www.vdh.virginia.gov/std/tbindex.asp

# *Flu Corner*

## Influenza Activity in Virginia

As of April 1, 2006, the Division of Consolidated Laboratory Services (DCLS) has confirmed a total of 90 cases of influenza for the 2005-2006 influenza season in Virginia (Table 1).

**Table 1: Virginia Flu Stats – Oct. 2, 2005, to Apr. 1, 2006**

| | | |
|---|---|---|
| Laboratory Confirmed Cases | Influenza A/H3 | 79 |
| | Influenza A/H1 | 9 |
| | Influenza B | 2 |
| | Total | 90 |
| Laboratory Confirmed Outbreaks | | 11 |
| Status (Apr. 1, 2006) | | Widespread |

While the influenza season to date has been relatively mild, healthcare professionals should be aware that influenza viruses continue to circulate and may need to be considered in patients presenting with respiratory infections. Additional information about Virginia's influenza activity level is available on the VDH website at www.vdh.virginia.gov/epi/flu.htm.

## National Influenza Activity

As of April 1, 2006, U.S. state influenza activity levels were at:

- Widespread in 13 states (including Virginia);
- Regional in 14 states;
- Local in 12 states;
- Sporadic in 10 states; and,
- No influenza activity in one state.

The proportion of deaths attributable to pneumonia and influenza in 122 cities monitored by the Centers for Disease Control and Prevention (CDC) has remained below the epidemic threshold. Since October 2, 2005, the CDC has received reports of 21 influenza-associated pediatric deaths; 18 of these deaths occurred during the current influenza season.

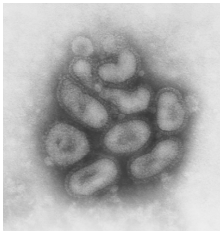
National influenza virus patterns are shown in Table 2. Overall, the trend has been a significant decline in influenza activity in recent weeks. In addition, healthcare professionals should note that there has been an increase in the proportion of influenza type B virus late in the influenza season (as observed in previous years).

The CDC website at www.cdc.gov/flu/weekly/fluactivity.htm has up-to-date details on influenza surveillance in the U.S.

## Virginia Pandemic Influenza Summit

The Virginia Pandemic Influenza Summit held on March 23, 2006, at the Greater Richmond Convention Center hosted over 1,000 participants. Secretary Michael Leavitt from the U.S. Department of Health and Human Services (DHHS) and Governor Kaine were the key speakers during the morning session. Important messages were that an influenza pandemic would impact all parts of society and that all states and localities need to have plans in place. Secretary Leavitt also explained that, because of the broad geographic impact of a pandemic, the federal government would not be able to provide all of the necessary resources; localities should not count on being able to obtain assistance from other parts of the state or country.

The afternoon of the summit featured nine facilitated breakout sessions covering issues from business response to education to healthcare. Details on the summit, including presentations and breakout session summaries, are available on the VDH pandemic influenza website at www.vdh.virginia.gov/pandemicflu/.



The Summit was extremely well received by participants as well as by Secretary Leavitt and others from DHHS.

**Table 2: National Flu Stats***

| | Week ending Apr. 1, 2006 | Oct. 2, 2005, to Apr. 1, 2006 |
|---|---|---|
| Specimens Tested | 2,790 | 114,891 |
| Specimens Positive | 464 (16.6%) | 14,377 (12.5%) |
| - Influenza A | 248 (53%) | 12,500 (86.9%) |
| - H3N2 | 47 (94.0%) | 4,837 (94.9%) |
| - H1N1 | 3 (6.0%) | 259 (5.1%) |
| - Not subtyped | 198 | 12,404 |
| - Influenza B | 216 (47%) | 1,877 (13.1%) |

*U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories

## Cases of Selected Notifiable Diseases Reported in Virginia*

| Disease | Total Cases Reported, February 2006 | | | | | | Total Cases Reported Statewide, January - February | | |
|---|---|---|---|---|---|---|---|---|---|
| | State | Regions | | | | | This Year | Last Year | 5 Yr Avg |
| | | NW | N | SW | C | E | | | |
| **AIDS** | 35 | 2 | 15 | 1 | 3 | 14 | 60 | 106 | 83 |
| **Campylobacteriosis** | 28 | 5 | 7 | 7 | 1 | 8 | 49 | 35 | 35 |
| **Chickenpox** | 41 | 5 | 12 | 8 | 5 | 11 | 46 | 22 | 55 |
| ***E. coli,* Shiga toxin-producing** | 4 | 2 | 0 | 1 | 0 | 1 | 4 | 2 | 2 |
| **Giardiasis** | 43 | 8 | 11 | 5 | 9 | 10 | 54 | 62 | 38 |
| **Gonorrhea** | 587 | 41 | 49 | 80 | 181 | 236 | 966 | 1,427 | 1,427 |
| **Group A Strep, Invasive** | 7 | 2 | 1 | 0 | 2 | 2 | 15 | 5 | 10 |
| **Hepatitis, Viral** | | | | | | | | | |
| **A** | 3 | 0 | 1 | 1 | 1 | 0 | 3 | 8 | 10 |
| **B, acute** | 4 | 0 | 0 | 2 | 1 | 1 | 4 | 29 | 17 |
| **C, acute** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | <1 |
| **HIV Infection** | 90 | 1 | 24 | 1 | 28 | 36 | 136 | 98 | 107 |
| **Lead in Children†** | 57 | 7 | 4 | 10 | 26 | 10 | 78 | 43 | 59 |
| **Legionellosis** | 4 | 1 | 0 | 0 | 1 | 2 | 5 | 3 | 2 |
| **Lyme Disease** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| **Measles** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Meningococcal Infection** | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 2 | 4 |
| **Pertussis** | 12 | 5 | 4 | 2 | 1 | 0 | 12 | 27 | 11 |
| **Rabies in Animals** | 57 | 15 | 10 | 16 | 9 | 7 | 71 | 63 | 59 |
| **Rocky Mountain Spotted Fever** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <1 |
| **Rubella** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Salmonellosis** | 46 | 7 | 13 | 10 | 9 | 7 | 57 | 72 | 73 |
| **Shigellosis** | 3 | 0 | 2 | 0 | 0 | 1 | 3 | 10 | 46 |
| **Syphilis, Early§** | 21 | 1 | 6 | 1 | 6 | 7 | 44 | 24 | 25 |
| **Tuberculosis** | 17 | 0 | 11 | 0 | 2 | 4 | 19 | 24 | 22 |

*Localities Reporting Animal Rabies This Month: Accomac 3 raccoons;* Albemarle 1 raccoon; Appomattox 1 skunk; Augusta 1 raccoon; Bath 1 bobcat; Bedford 3 raccoons; Botetourt 1 raccoon; Brunswick 1 bobcat; Buckingham 2 skunks; Campbell 1 skunk; Culpeper 1 raccoon; Cumberland 1 raccoon; Fairfax 4 raccoons; Fauquier 4 skunks; Franklin 3 raccoons; Gloucester 1 raccoon; Goochland 1 skunk; Greensville 1 fox; Hanover 2 raccoons; King William 1 raccoon; Loudoun 2 raccoons, 1 skunk; Louisa 1 fox; Mathews 1 raccoon; Nelson 2 skunks; Northampton 1 raccoon; Page 1 raccoon; Patrick 1 fox, 1 raccoon; Powhatan 1 raccoon; Prince William 2 foxes, 1 raccoon; Rappahannock 1 fox; Roanoke 1 skunk; Rockbridge 1 raccoon; Rockingham 1 raccoon; Wythe 1 lamb, 1 raccoon, 2 skunks.
*Toxic Substance-related Illnesses:* Adult Lead Exposure 12; Pneumoconiosis 4.
*Data for 2006 are provisional. †Elevated blood lead levels ≥10µg/dL. §Includes primary, secondary, and early latent.

## *Virginia Online Injury Reporting System*

The Office of Family Health Services' Center for Injury and Violence Prevention has developed the Virginia Online Injury Reporting System (VOIRS). This publicly available database contains information about injury-related deaths and hospitalizations occurring from 1999 through 2004. Users can create their own queries and reports on injury mechanisms using a variety of demographic variables. The reports are available for several geographic levels, including the health district level. Age-adjusted rates are also available so that the influence of differing age distributions can be removed from comparisons of injuries across geographic areas. VOIRS can be found at: www.vahealth.org/CIVP/VOIRS/

Additionally, the *Injury in Virginia 2004* report on injury-related deaths and hospitalizations is now available at: www.vahealth.org/civp/InjuryInVirginia%202004.pdf. The report contains crude hospitalization and death rates, as well as age-adjusted rates that can be used to compare Virginia to the U.S. and other locations. The report also includes a section on injuries and deaths that occur due to traumatic brain injuries.