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Mycobacterium tuberculosis Laboratory Testing Practices—Connecticut, January 2014 – June 2015

Tuberculosis (TB) is a chronic bacterial infection caused by *Mycobacterium tuberculosis* and is transmitted via the airborne route. In Connecticut, laboratories are required to report to the Department of Public Health (DPH) TB Control Program and local health department evidence of TB disease including positive acid-fast bacilli (AFB) smear, nucleic acid amplification test (NAAT), and culture results (*1*). TB isolates must also be sent to the state public health laboratory (PHL) for further characterization and drug susceptibility testing.

In October 2015, the TB Control Program sent a survey of *M. tuberculosis* laboratory testing practices to 30 hospital and commercial laboratories, and to the PHL, which serves as the state TB reference laboratory. Information collected included types of tests used for TB diagnosis, volume of testing and staffing, scheduling for mycobacterial processing or testing, patterns of referral for specialized testing, use of the PHL, and reporting practices to DPH, including timeliness. The results of this survey were also compared to the results of a similar survey conducted in 2008 (*2*).

All 30 laboratories responded of which, 7 (23.3%) indicated that they did not test clinical specimens for mycobacterial smear, NAAT or culture. For the remaining 23 laboratories, the median AFB clinical specimens tested was 255 (range 14–1,348). Also, 18 (78.3%) sent clinical specimens to another laboratory as needed for specialized testing and of these, 15 (83.3%) referred specimens to the PHL. Of the 8 (34.8%) laboratories that did not send specimens to the PHL, 5 tested in house and 3 sent specimens to commercial laboratories.

Of the 23 laboratories that conducted TB testing, 14 (60.9%) performed culture (solid and broth media) for *M. tuberculosis* of which, 8 (57%) performed identification of acid-fast isolates.

In this issue...

Twenty (87%) stated they report findings to the DPH even if they refer clinical specimens to another laboratory. Reporting time varied with 3 (13%) laboratories indicating a lag of more than 3 days to report, and 7 (30.4%) indicating not applicable. Analysis of data from 5 high volume laboratories did not reveal significant issues with missing reports.

Connecticut has limited availability of specialized TB testing. Of the 30 in-state laboratories, 6 (20%) perform an interferon gamma release assay (IGRA), 8 (27%) perform NAAT on clinical specimens, 3 (10%) perform first-line drug susceptibility testing, and 1 (3.3%) performs second-line drug susceptibility testing.

Comparison to the 2008 survey

Twenty-eight laboratories for each year were compared; 6 (3 from the 2008 survey and 3 from the 2015 survey) were excluded from further analysis because they did not participate in the survey for both years. The percentage of laboratories performing IGRA in 2015 (14.3%) nearly doubled when compared to 2008 (8.7%) data (Table, see page 2). A higher percentage (30.8%) of laboratories tested in-house in 2008 when compared to 2015 (19.1%) data. Of the laboratories testing in house in 2008, 3 (37.5%) indicated sending specimens to an outside laboratory in the 2015 survey. Laboratories sending clinical specimens to an outside laboratory in the 2015 survey referred specimens to the PHL more frequently (88.2%) when compared to the same laboratory in the 2008 survey (68.4%).

A higher percentage of laboratories performed NAAT (28.6%), culture (61.9%), and identification of acid-fast isolates (53.9%) in 2015 compared with

Table. Comparison of Mycobacterium tuberculosis testing services offered by hospital and commercial laboratories in Connecticut, 2008 and 2015.

	Survey year	
	2008 (N=28) (%)	2015 (N=28) (%)
Interferon-gamma release assay		
Perform	2/23 (8.7)	4/28 (14.3)
Missing	5/28 (17.9)	0
Plan to perform	4/18 (22.2)	3/24 (12.5)
Missing	10/28 (35.7)	0
Nucleic acid amplification		
Yes	4/17 (23.5)	6/21 (28.6)
Missing	9/26 (34.6)	0
No	13/17 (76.5)	15/21 (71.4)
Send to DPH	6/10 (60)	12/15 (80)
Send to other laboratory	4/10 (40)	3/15 (20)
Missing	3/13 (23.1)	0
Culture for *M. tuberculosis*		
Yes	15/26 (57.7)	13/21 (61.9)
No	11/26 (42.3)	8/21 (38.1)
Send to DPH	7/9 (77.8)	7/8 (87.5)
Send to other laboratory	2/9 (22.2)	1/8 (12.5)
Missing	2/11 (18.2)	0
Identification of acid-fast isolates		
Yes	7/15 (46.7)	7/13 (53.8)
No	8/15 (53.3)	6/13 (46.2)
Send to DPH	7/8 (87.5)	5/6 (83.3)
Send to other laboratory	1/8 (12.5)	1/6 (16.7)

those laboratories that performed the same tests in 2008. The percentage of laboratories conducting drug susceptibility testing was the same for both survey-years (28.6%). In 2015, 80% (12/15) sent specimens to the PHL for NAAT, 87.5% (7/8) for culture, and 100% (5/5) for drug susceptibility testing. This was an increase when compared to 2008 survey data.

Reported by

N Montero, MPH, L Sosa, MD, Tuberculosis Control Program, Connecticut Department of Public Health; G Budnick MS, J Razeq PhD, Connecticut Department of Public Health Laboratory; M Lobato, MD, Division of Tuberculosis Elimination, Centers for Disease Control and Prevention.

Editorial

Mycobacterium tuberculosis continues to cause disease and death in the United States despite being treatable and preventable. Understanding TB laboratory capacity and testing practices is important for timely and appropriate management of patients and reporting to public health departments. This survey was implemented to determine the capacity of laboratories in Connecticut for TB testing.

A comparison of survey results to a similar survey conducted in 2008 showed that more laboratories are performing IGRA and referring specimens to the PHL. While the majority of laboratories in Connecticut process or test specimens for TB, more specialized testing is performed only at a few laboratories. This finding is likely reflective of two things. First, over the last several years, several hospitals in the state have formed partnerships which naturally lead to consolidation of services to fewer facilities. Second, the rate of TB disease has decreased 39.3% since 2008 (*3*). As TB incidence declines and fewer specimens tested, it will be important for hospital and commercial laboratories to determine if they can maintain proficiency in the techniques used to diagnose *M. tuberculosis*. Laboratories performing acid-fast microscopy and examination of less than 15 AFB smears or processing and culturing of less than 20 clinical specimens per week for *M. tuberculosis* should preferably refer clinical specimens to the PHL (*4*).

Timeliness of reporting was identified as a potential area for improvement in the 2015 survey. Three (13%) laboratories specified not reporting *M. tuberculosis* findings to DPH when they refer clinical specimens to another laboratory. It is important for laboratories to recognize that even if a specimen is referred, they are required to report results on specimens originating at their laboratory. This might help minimize reporting lag times and ensure TB patients in Connecticut are diagnosed and treated quickly, ultimately decreasing the risk of transmission to others.

In Connecticut, these results will be used to monitor TB testing practices as changes are anticipated with the evolving healthcare landscape. The DPH TB Control Program and PHL offer technical assistance to laboratories, and ensure all recommended tests are available to TB patients. These partnerships are vital for the continued availability of reliable testing for the diagnosis and treatment of TB disease as the DPH works towards the goal of TB elimination.

References

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Rabies Testing of Domestic and Wild Animals – Connecticut, 2014-2015

The Department of Public Health (DPH) Public Health Laboratory (PHL) offers testing of animals that could have exposed people to the rabies virus. Results of testing help guide decision making regarding post exposure prophylaxis for persons exposed. The Advisory Committee on Immunization Practices (ACIP) develops national guidelines for determining the likelihood of rabies virus exposure and considers multiple factors, including the species of animal, type of contact, and circumstances of the incident (*1*). Euthanasia and testing of animals should be conducted when: 1) risk assessment of an incident indicates virus transmission could have occurred, and 2) other measures, such as observation of animals in confinement, are not adequate to determine the need for rabies post-exposure prophylaxis.

To better align rabies testing activities with public health priorities and laboratory resources, analysis of data collected on the Request for Rabies Examination form was conducted during 2010 (*2,3*). This analysis showed specimens were submitted under circumstances that did not constitute human exposures. The Request for Rabies Examination form was subsequently revised and included clarification of submission guidelines (*4*). Analysis of data collected during 2011-2013 was published in 2014 (*5*). This article summarizes testing performed at the DPH PHL during 2014-2015.

During 2014-2015, the total number of specimens tested was 4,462, and included 1,586 (36%) bats, 1,023 (23%) cats, 693 (16%) dogs, 416 (9%) raccoons, 301 (7%) skunks, 145 (3%) groundhogs, and 95 (2%) opossums. These seven species accounted for 95% of all animals submitted. Among these species, 334 (8%) tested positive. Positivity varied by species tested including 44% of raccoons, 28% of skunks, 3% of groundhogs, 3% of bats, 1% of cats and <1% of dogs; no opossums tested positive.

Of the skunk, raccoon, groundhog and opossum submissions with known exposure types, 69% (643/926) were due to potential exposures of domestic animals not involving people. Of bat submissions with known exposure types, 89% (1319/1,474) were due to concern for potential human exposures. The current Request for Rabies Examination form does not capture details needed to determine if ACIP recommendations are followed for bat exposures; however, guidance is provided on the back of the form.

Of the cat and dog submissions, 81% (1,385/1,716) were due to potential human exposures only. Of these, bites accounted for 89% (523/590) of dog submissions, and 58% (458/795) of cat submissions. Of the cats and dogs submitted for testing with a known vaccine history and history of biting a human only, 72% (322/449) of dogs and 28% (98/345) of cats were current on their vaccinations.

Reported by

R Nelson, DVM, MPH, S Ertel, Epidemiology and Emerging Infections Program; K Kudish, DVM, MSPH, Immunizations Program; J Razeq, PhD, HCLD (ABB), A Muyombwe, PhD, HCLD (ABB), State Public Health Laboratory, Department of Public Health

Editorial

Rabies is primarily a disease of animals that can be spread to people. In people, rabies virus infection causes encephalitis that is nearly always fatal. However, clinical illness can be prevented by conducting a thorough risk assessment based on ACIP national guidelines, and administering rabies post-exposure prophylaxis when an exposure has occurred. To help guide medical management of domestic animals and people who are at risk of rabies virus infection, the DPH PHL has offered testing of potentially infected animals at no charge to the public, state agencies, and municipal

governments. To assure that currently available DPH PHL resources are utilized for public health priorities, submission requirements have been modified and are currently being implemented.

The DPH PHL will continue free testing on animals involved in human exposures resulting from a bite or introduction of infectious material including saliva or central nervous system tissues into an open wound or onto mucous membranes. These may include wild terrestrial mammals known to transmit rabies involved in human exposures, bats in direct contact with people or present in a room when a person was unable to recognize (e.g. sleeping) or communicate (e.g. young child) that contact occurred, and domestic animals euthanized because of illness while in quarantine for biting a person.

For questions regarding human rabies exposures, contact the DPH Epidemiology and Emerging Infections Program at 860-509-7994. For questions regarding domestic animal rabies exposures contact, the Department of Agriculture Animal Control Division at 860-713-2506. Information regarding specimen submissions including the submission form is available at: http://www.ct.gov/dph/lib/dph/infectious_diseases/rabies/rabiestestform_ol97a.pdf or by calling 860-920-6662 or 860-920-6500 during normal business hours.

References

1. CDC. Human Rabies Prevention – United States, 2008. MMWR 2008; 57 (No. RR-3)
2. Connecticut Department of Public Health. Rabies Surveillance Update – Connecticut, 2005-2009. Connecticut Epidemiologist, Vol. 30, No. 4; 13-15. May 2010.
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Modifications to Rabies Testing Requirements and Testing Hours

The Connecticut Department of Public Health's (DPH) Katherine A. Kelley State Public Health Laboratory will no longer offer testing for:

- wild animals in contact with domestic animals
- bats submitted by nuisance wildlife control operators
- small rodents (e.g. mice, rats, chipmunks, moles)
- wild rabbits

Dogs and cats that bite people should be placed in quarantine for observation and only euthanized and submitted for testing if suspected by a veterinarian of being rabid or ordered by an Animal Control Officer.

- All cats and dogs, regardless of size, must be decapitated for submission to the state lab

Rabies testing will be conducted from 7:30 AM to 4:00 PM, Monday through Friday. Specimens submitted after 10:00 AM the day before the weekend or a holiday, or when the DPH Public Health Laboratory is closed, will be refrigerated and tested on the next business day. Routine weekend and holiday testing is discontinued. Information regarding specimen submissions including the submission form is available at http://www.ct.gov/dph/lib/dph/infectious_diseases/rabies/rabiestestform_ol97a.pdf or by calling the DPH Public Health Laboratory at 860-920-6662 or 860-920-6500.

Animals not accepted for testing by the DPH Public Health Laboratory may be submitted for testing at the Connecticut Veterinary Medical Diagnostic Laboratory, University of Connecticut in Storrs. Contact information, submission forms and fees are available at: http://cvmdl.uconn.edu/ (860-486-3738).

For questions regarding human rabies exposures, contact the DPH Epidemiology and Emerging Infections Program at 860-509-7994. For questions regarding domestic animal rabies exposures, contact the Department of Agriculture Animal Control Division at 860-713-2506. For questions or comments regarding the new submission guidelines, contact Dr. Anthony Muyombwe, Public Health Laboratory Division Director, Biosciences at the State Public Health Laboratory, 860-920-6506.