



The Florida Lab Link

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MERS—The Florida Experience

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Middle East Respiratory Syndrome (MERS) is a viral respiratory illness first reported in Saudi Arabia in 2012. On May 2, 2014 the first United States (U.S.) case of MERS was confirmed in a traveler who came to the U.S. (Indiana) from Saudi Arabia, via London and Chicago. The traveler was a U.S. citizen who lived and worked as a health care provider in Saudi Arabia at a hospital in which MERS patients had received care.¹

On May 1, another individual traveled by plane from Jeddah, Saudi Arabia to London, England, to Boston, Massachusetts, to Atlanta, Georgia and finally to Orlando, Florida. He reported feeling unwell during the flight from Jeddah to London and continued to feel unwell on subsequent flights with reported symptoms that included fever, chills and a slight cough.² Surveillance in Florida hospitals had increased with the recent confirmation in Indiana of the first case of MERS on American soil. Therefore, on May 9, 2014 when the patient went to the emergency room, he was admitted the same day.

Because of the patient’s symptoms and travel history, the Bureau of State Investigations Unit manager and epidemiologist notified the Bureau of Public Health Laboratories (BPHL) in Tampa that there was a patient in an Orlando hospital who met the criteria of a person under investigation suspected to have MERS. The patient’s serum sample and pharyngeal swabs were sent by courier to be tested that same day and by 9:00 p.m. that evening the staff had completed the initial real time reverse transcription (RRT) polymerase chain reaction (PCR) testing to detect the virus.

The PCR assay looks for two genetic targets in the virus. If both targets are negative, the sample is reported as negative. In this case, the pharyngeal swab samples were negative. However, one target was positive in the serum sample, but the other target was negative, which required testing for a third genetic target. The third target was also negative indicating an equivocal result. Unable to conclusively make the determination, a call was made to the Centers for Disease Control and Prevention (CDC) Emergency Operations Center subject matter experts on duty who advised the laboratory to get a sputum sample for further testing.

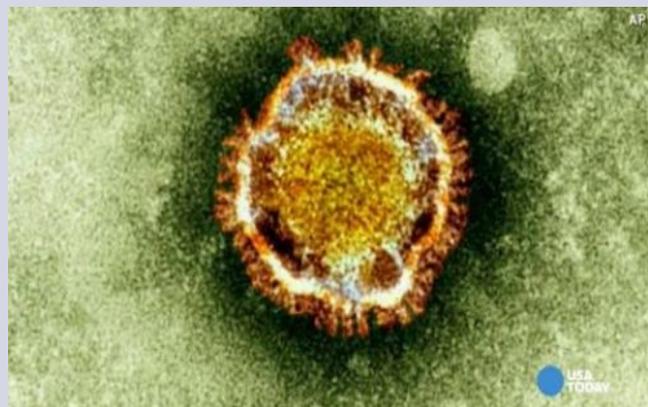


On May 10, the sputum sample was collected by the health department in Orange County epidemiologists and forwarded to BPHL in Tampa that afternoon. Testing was completed, and the sample was positive for those first two genetic targets, with very strong signals for both. The third target was tested, and this was also positive. If the sample is positive, the testing algorithm requires confirmation by the CDC, so it was forwarded to Atlanta where the CDC confirmed the second case of MERS-CoV infection in the U.S. on May 11.

As part of the prevention and control measures, the Florida epidemiologists began reaching out to health care professionals, family members and others who had close contact with the patient to provide guidance about monitoring their health and recommending they see a health care provider for an evaluation. Public health officials worked closely with airlines to identify and notify U.S. travelers who may have been in close contact with the patient on any of the flights and, where necessary, obtained serum for testing.² As the news spread throughout the community, the number of persons under investigation began to rise. Florida's BPHL reached out to the Indiana public health laboratory about their recent experiences as they prepared for continual testing of samples from additional exposure contacts.

The laboratory response in Florida deviated from Indiana's recent experience in that Florida received the 2013 Coronavirus Emergency Use Authorization (Potential Emergency), which declared that circumstances existed justifying the authorization of emergency use of in vitro diagnostics for detection of the MERS-CoV and allowed the Tampa laboratory to test the swabs on-site instead of forwarding them to the CDC for confirmation.³

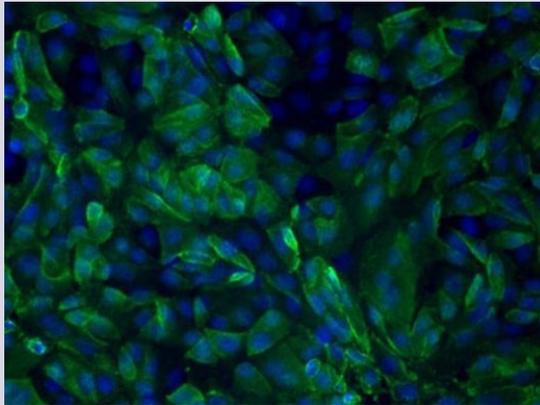
The BPHLs in Jacksonville and Miami also received samples to test for additional cases of MERS-CoV. From Monday, May 12, until Wednesday, May 21, all patients symptomatic with respiratory illness and meeting the case definition were tested to rule out MERS, and all were ruled as negative. Once he had two consecutive negative test results, the original patient was released from the hospital the following Sunday, May 18. Since the event in May, the number of samples tested has declined to the numbers prior to the first patient testing positive in Indiana.



MERS Virus.

(Image source: USA Today)

The MERS-CoV is a virus that is new to humans. Since July 23, 2014, including this U.S. importation, there have been globally 837 laboratory-confirmed cases of infection with MERS-CoV including at least 291 related deaths that have officially been reported to the World Health Organization (WHO). Most of these people developed severe acute respiratory illness, with fever, cough and shortness of breath. Officials do not know the origination of the virus or exactly how it spreads. There is no available vaccine or specific treatment recommended for the virus.⁴



Human serum antibodies react with MERS-CoV-infected Vero cells, indicating the patient has been infected with MERS-CoV. (Image source: Jennifer L. Harcourt, CDC).

References.

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4. Middle East respiratory syndrome coronavirus (MERS-CoV) – update. Disease outbreak news 23 July 2014. Retrieved from http://www.who.int/csr/don/2014_07_23_mers/en/

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INFECTION CONTROL FOR COLLECTING AND HANDLING SPECIMENS

It is expected that all laboratorians and other healthcare personnel collecting or handling specimens follow established standards compliant with the OSHA bloodborne pathogens standard¹, which encompasses blood and other potentially infectious materials. This includes wearing appropriate personal protective equipment (PPE) and adhering to engineered safeguards, for all specimens regardless of whether they are identified as being infectious.

Recommendations for specimen collection: full face shield or goggles, masks to cover all of nose and mouth, gloves, fluid resistant or impermeable gowns. Additional PPE may be required in certain situations.

Recommendations for laboratory testing: full face shield or goggles, masks to cover all of nose and mouth, gloves, fluid resistant or impermeable gowns AND use of a certified class II Biosafety cabinet or plexiglass splash guard, as well as manufacturer-installed safety features for instruments.

1. The OSHA Bloodborne Pathogens Standard can be found at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10051&p_table=STANDARDS

AMERICAN SOCIETY FOR MICROBIOLOGY (ASM) SENTINEL LEVEL CLINICAL LABORATORY PROTOCOLS FOR SUSPECTED BIOLOGICAL THREAT AGENTS AND EMERGING INFECTIOUS DISEASES

The ASM Sentinel Level Clinical Laboratory Protocols For Suspected Biological Threat Agents And Emerging Infectious Diseases for *Bacillus anthracis* (anthrax) has been updated. Please remember to update all of your laboratory's biodefense reference manuals.

In coordination with the CDC and the Association of Public Health Laboratories (APHL), the ASM has updated protocols designed to offer Laboratory Response Network (LRN) Sentinel Level Clinical Laboratories standardized, practical methods and techniques to rule out microorganisms suspected as agents of bioterrorism, or to refer specimens to public health laboratories for confirmation.

The current edition is compliant with the Clinical Laboratory Standards Institute (CLSI) format based on current information and recommendations of the APHL Sentinel Laboratory Partnerships and Outreach Subcommittee. These protocols reflect the standard practices for specimen processing, as well as agent specific guidance. In addition to promoting standardization and uniformity of testing, adherence to, and maintaining the highest level of safety practices, is emphasized in the respective protocols.

Updated guidelines can be found at the ASM website: <http://www.asm.org/index.php/issues/sentinel-laboratory-guidelines>.



CHEMICAL THREAT (CT) PREPAREDNESS TRAINING

The CT laboratory coordinators are continuing to reach out to the health and medical community by offering training for CT preparedness at hospitals and county health departments. This training covers chemical terrorism awareness and the collection of clinical specimens after a chemical terrorism event. Hospital and county health department staff play an important role in the response to a chemical exposure event since clinical specimens will be collected for analysis. For your convenience and to increase participation, this training can be presented at your facility. Each course lasts approximately one hour with one 15-minute break between courses. Florida clinical laboratory and nursing continuing education (CE) credits will be offered. Training manuals, "hands on" exercise materials and CT preparedness kits will be provided. This training is recommended for physicians, nurses, epidemiologists, emergency department personnel, phlebotomists, hospital and health department laboratory personnel, and others who may collect clinical specimens. Contact the CT laboratory coordinators in your region for more information (see the Bureau of Public Health Laboratories Directory on the back of this document for contact information).

LABORATORY RESPONSE NETWORK (LRN) TRAINING—BIOLOGICAL DEFENSE

The BPHL is currently offering an LRN Sentinel Laboratory training course at no cost to you at your facility. This training follows the American Society For Microbiology(ASM) Sentinel Level Clinical Laboratory Protocols for Suspected Biological Threat Agents and Emerging Infectious Diseases. Scheduling the training at your facility is a simple process. Determine when you would like to have the training and how many people will be attending. A time will be set up that is convenient for all. The training materials are provided, as well as the biodefense reference manuals for your laboratory.

The training syllabus includes: 1) an overview of the LRN; 2) the ASM protocols for ruling out potential bioterrorism agents and how to refer a sample to the state LRN public health reference laboratory when a bioterrorism agent cannot be ruled out; 3) the role of the sentinel laboratory in responding to pandemic influenza; 4) a brief introduction to packaging and shipping of infectious substances; 5) an introduction to the CDC Select Agent Program; and 6) the College of American Pathologists Laboratory Preparedness Exercise (CAP LPX).

This class awards Florida clinical laboratory continuing education (CE) credits based on five hours of instruction. Please contact Betty Wheeler at (904) 791-1568 (Betty.Wheeler@FLhealth.gov) to schedule a class for your facility.

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