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**PUBLIC HEALTH LABORATORY GUIDELINES – MERS-CoV
(Middle East Respiratory Syndrome Coronavirus)**

Case Definition	<p>A person who has both clinical features and an epidemiologic risk should be considered a patient under investigation(PUI) based on the following scenarios:</p> <p>A. Severe Illness</p> <ul style="list-style-type: none"> • Fever <i>and</i> pneumonia or acute respiratory distress syndrome (based on clinical or radiological evidence) AND History of travel from countries in or near the Arabian Peninsula¹ within 14 days before symptom onset; -OR- Close contact with a symptomatic traveler who developed fever and acute respiratory illness (not necessarily pneumonia) within 14 days after traveling from countries in or near the Arabian Peninsula -OR- • A history of being in a healthcare facility (as a patient, worker, or visitor) in the Republic of Korea within 14 days before symptom onset. -OR- • Is a member of a cluster of patients with severe acute respiratory illness (e.g. fever and pneumonia requiring hospitalization) of unknown etiology in which MERS-CoV is being evaluated, in consultation with Guam Public Health department. <p>B. Milder Illness</p> <ul style="list-style-type: none"> • Fever <i>and</i> symptoms of respiratory illness (not necessarily pneumonia; e.g. cough, shortness of breath) AND • A history of being in a healthcare facility (as a patient, worker, or visitor) within 14 days in or near the Arabian Peninsula in which recent healthcare-associated cases of MERS have been identified. <p>C. Fever or symptoms of respiratory illness (not necessarily pneumonia; e.g. cough, shortness of breath) AND</p> <p>Close contact with confirmed MERS case while the case was ill.</p>
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<p>Specimen Requirements</p>	<p>Points to consider when determining which specimen types to collect from a PUI for MERS include:</p> <ul style="list-style-type: none"> • The number of days between specimen collection and symptom onset • Symptoms at the time of specimen collection <p>Preferred Specimens</p> <ul style="list-style-type: none"> • Lower Respiratory tract specimens – Sputum, bronchoalveolar lavage, tracheal aspirate, pleural fluid <p>Other Acceptable Specimens</p> <ul style="list-style-type: none"> • Nasopharyngeal specimen • Oropharyngeal specimen • Stool • Serum – to be collected along with lower respiratory tract specimen if symptom onset was 14 or more days ago. <p><i>Note: Respiratory specimens should be collected as soon as possible after symptoms begin, ideally within 7 days and before antiviral medications are administered.</i></p>
<p>Pre-Collection Guidelines:</p>	<ul style="list-style-type: none"> • Prior to collection of any specimen, call the Department of Public Health and Social Services (DPHSS), Bureau of Communicable Disease Control for consultation. No specimen(s) will be accepted at DPHSS Laboratory without consultation. <ul style="list-style-type: none"> ➤ Primary Contact Person: Josephine O’Mallan, BCDC Administrator Contact numbers: (671) 735-7142 or 888-9276 ➤ Secondary Contact Person: Estelle A. Ada, ELC Coordinator Contact numbers: (671) 735-7154 or 787-6890 ➤ Alternate: Alan Mallari, Microbiologist Contact numbers: (671) 735-7153/7355
<p>Specimen Collection Guidelines</p>	<p>Specimens will be sent to the Hawaii State Laboratory by DPHSS Public Health Laboratory for testing.</p> <p>Specimen Types and General Guidelines:</p> <ol style="list-style-type: none"> 1. Respiratory Specimens <ol style="list-style-type: none"> a. Bronchoalveolar lavage, tracheal aspirate, pleural fluid Collect 2-3 ml into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container. Refrigerate specimen at 2-8°C up to 72 hours; freeze if more than 72 hours. b. Sputum Patient should rinse the mouth with water and then expectorate deep cough sputum directly into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container. Refrigerate specimen at 2-8°C up to 72 hours, freeze if more than 72 hours.

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	<p>c. Nasopharyngeal AND oropharyngeal swabs (NP/OB swabs) Use only synthetic fiber swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden shafts. Use swabs in the UTM viral transport kit provided by DPHSS Public Health Laboratory. Place swabs immediately into the viral transport media. Specimens can be refrigerated at 2-8°C up to 72 hours; freeze if longer than 72 hours.</p> <ul style="list-style-type: none">• Nasopharyngeal swabs: Insert a swab into the nostril parallel to the palate. Leave the swab in place for a few seconds to absorb secretions. Swab both nasopharyngeal areas.• Oropharyngeal swabs: Swab the posterior pharynx, avoiding the tongue.• Nasopharyngeal wash/aspirate or Nasal aspirates Collect 2-3 ml into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container. Specimen can be refrigerated at 2-8°C up to 72 hours; freeze if longer than 72 hours. <p>2. Blood Components</p> <p>2.1 Serum (for serological testing) Collect serum specimens during the acute stage of the disease, preferably during the first week after the onset of illness, and during convalescence, ≥ 3 weeks after the acute sample was collected. Serum sample collected 14 or more days after symptom onset is also acceptable.</p> <p><i>Note: The MERS-CoV serologic test is for research/surveillance purposes and not for diagnostic purposes.</i></p> <p>2.2 Serum (for RT-PCR)- for detection of virus, not antibodies Collect serum specimen during the first week after symptom onset, preferably within 3-4 days after symptom onset.</p> <p><u>Children and Adults:</u> Collect 5-10 ml of whole blood in a serum separator tube. Spin, separate and transfer serum (minimum of 200 ul) into a sterile tube container. Refrigerate specimen at 2-8°C. Frozen samples also acceptable.</p> <p><u>Infants:</u> collect 1 ml of whole blood in EDTA tube and in a serum separator tube (SST). If only 1 ml can be obtained, use SST. Refrigerate specimen at 2-8°C. Do not freeze EDTA whole blood.</p> <p>3. Stool Collect 2-5 grams of stool specimen (formed or liquid) in a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container. Refrigerate at 2-8°C for up to 72 hrs; if exceeding 72 hrs, freeze at -70°C.</p> <p>NOTE: Label each specimen container with the patient's name, ID number, specimen type and the date the sample was collected.</p>
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<p>Specimen Submission Guidelines</p>	<ul style="list-style-type: none"> • Submit appropriate type of specimen, depending on the number of days between specimen collection and symptom onset and symptoms at the time of specimen collection. Refer to Specimen Collection instructions above for acceptable specimens. • Fill out COMPLETELY the MERS Patient Under Investigation (PUI) Short Form and submit with the specimen. • Call DPHSS Public Health Laboratory at 735-7153/735-7158/735-7355 to inform staff of the specimen delivery. • Follow storage and transport requirements for each specimen type. • Specimens will be sent to Hawaii State Laboratory or CDC for testing. • Physicians/providers will be notified of the result by DPHSS Public Health Laboratory Technologist once final result is received from the reference laboratory.
<p>Safety Precautions</p>	<ul style="list-style-type: none"> • Observe Universal Precautions when handling specimens from MERS Patient Under Investigation (PUI). • Use appropriate personal protective equipment (PPE) such as disposable gloves, laboratory coat/gown, mask (N-95), and eye protection when handling potentially infectious specimens from MERS PUI. For more detailed safety precautions when dealing with PUI for MERS, refer to CDC-MERS-Infection Prevention and Control at http://www.cdc.gov/coronavirus/mers/infection-prevention-control • Specimens for transport to DPHSS Public Health Laboratory must be placed in a sealed bag and placed in a sealed, decontaminated primary container. • All disposable wastes used for collection should be autoclaved.
<p>Specimen Transport Guidelines</p>	<p>Transport specimens with cold packs (2-8 C), with dry ice if exceeding 72 hrs. Deliver specimens to DPHSS Public Health Laboratory in Mangilao no later than 4 PM, Mondays-Fridays.</p>
<p>Rejection Criteria</p>	<ul style="list-style-type: none"> • Specimen quantity is insufficient to perform the test; • Dry swabs • NP or OP specimens collected in calcium alginate swabs or swabs with wooden shafts. • Specimen received in a container that is leaking. • Specimen is not collected in a proper container or special handling instruction is not followed; • Specimen is not received at 2-8°C/ packed on cold packs; • Unlabeled specimens, incomplete label on specimen (Refer to Specimen Collection Guidelines). • Illegible/ incomplete MERS Short forms (e.g., no date of onset, travel history, etc.) • Specimen label does not match the MERS short form.

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Result Notification	Laboratory reports will be forwarded to the submitting facility, Territory Epidemiologist, and the BCDC Administrator via FAX. Any other request for copies of laboratory reports, apart from that stipulated above will not be accepted.
Contact Information	<p>Alan Mallari, Microbiologist II, (Primary) (671) 735-7153/355 alan.mallari@dphss.guam.gov</p> <p>Joy S. Villanueva, Chemical Terrorism Medical Technologist 1, (alternate) (671) 735-7153 /158 (671) 735-7158 FAX joy.villanueva@dphss.guam.gov</p> <p>Josephine T. O'Mallan, BCDC Administrator, (671) 735-7142; (671) 888-9276 (emergency) Josephine.omallan@dphss.guam.gov</p>

Attachment: Middle East Respiratory Syndrome (MERS) Patient Under Investigation (PUI) Short Form

References:

1. CDC MERS-CoV Case Definitions, June 11, 2015.
2. CDC Interim Guidance for Health Professionals, May 14, 2014.
3. CDC Interim Guidance on Specimen Collection, Processing and Testing for Patients for Middle East Respiratory Syndrome Coronavirus- Version 2, Jan. 9, 2014.
4. CDC Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Middle East Respiratory Syndrome Coronavirus (MERS-CoV), July 2, 2013