II Microbiology

1 Contact information

General enquiries	2319 8360
Clinical enquiries	2319 8254 / 255 / 355

2 Scope of service

The list of specific examinations for individual sample types available from Microbiology Division together with description of the test methods used can be accessed from the following HOKLAS website: https://www.itc.gov.hk/en/quality/hkas/doc/scopes/801P.pdf. The laboratory would not contract out unavailable tests to other laboratories.

3 Containers required for different tests

Specimens for more than one test can be collected in the same container as appropriate.

Intended use	Container [Code]
Bacteriology / mycology - Stool - Sputum - Nasopharyngeal swab for pertussis - Other swab - Urine - Blood - Skin / hair / nail - Steam sterilizer	 - Stool container (yellow-capped) [P1] - Sterile container (pink-capped) [P2] - Sterile swab (Amies transport medium [charcoal]) [P10] - Sterile swab set with bacterial transport medium [P3] - Container with preservatives (red-capped) [P5] - Blood culture bottles (aerobic and anaerobic) [P8] - Paper envelope [P9] - Spore strips (biological indicators) [P6]
Sterile body fluids for all tests	- Sterile container: 30 mL [P7] / 7 mL [P30]
Urine for Legionella antigen	- Plain container (white-capped) [P4]
Mycobacteriology - Early morning urine - Sputum / stool	 - 1 litre bottle [P16] - Sterile container (translucent with white cap) [P17]
Cytomegalovirus (CMV) culture	- Cytomegalovirus transport medium (“CMV”) [P21]
Other virology / molecular testing	- Viral transport medium (“TM”) [P22]
Serology tests	- Vacuette plain tube (red-capped) [P24]
Blood-borne parasites microscopy	- EDTA tube (purple-capped) [C3 / C6]

Note 1: Other specialized materials for specimen collection are provided with prior arrangement.
Note 2: All materials provided should not be used after expiry if applicable.

4 Timing of specimen collection

(a) Direct detection and culture: As soon as possible after onset of illness

(b) Antibody detection:
- IgM: Usually 5-7 days after onset of illness
- Antibody titre: Paired acute and convalescent sera preferably 10-14 days apart
- IgG: Any time after window period for persistent infection and immunity testing

5 Guideline for specimen collection and storage

(a) Follow infection control guidelines of your institution and Code of Practice on waste disposal promulgated by the Environmental Protection Department. The following may be referenced: https://apps.who.int/iris/bitstream/handle/10665/66348/WHO_CDS_CSR_EDC_2000.4.pdf;sequence=1

(b) Choice of specimen should be based on clinical features and suspected aetiological agents:
   i. Specimens from relevant anatomical sites should be collected for direct detection tests. Occasionally, other specimens might be useful (e.g. faecal specimens for enterovirus detection for meningitis, myocarditis and rash illness).
   ii. Serology testing for acute infection is retrospective and not usually recommended as first line diagnostic tests. Some exceptions where serology testing may be useful include measles, rubella, dengue fever, infectious mononucleosis, Japanese encephalitis, and hantavirus and rickettsial infections.

(c) Specimens should be transported to the laboratory as soon as possible, preferably within the same day after collection. In general, if delay in despatch is unavoidable, keep specimens refrigerated at 4°C except the following:
   i. The following specimens for bacterial / fungal culture and parasitology examination should be kept at room temperature:
      - Blood
      - Cerebrospinal fluid
      - Genital specimens
      - Enteric specimens
      - Dermatological specimens
      - Spore strips
   ii. EDTA blood (6 mL) for hepatitis B virus (HBV) DNA, hepatitis C virus (HCV) RNA and human immunodeficiency virus (HIV-1) RNA quantitation must be kept at 2-25°C and arrive at PHLC within 24 hours of collection. Otherwise, plasma/serum (3 mL) should be separated within 24 hours of collection, stored at 2-8°C and sent to PHLC within 6 days.

6 Laboratory request form & labelling of specimen containers

Forms generated by electronic system from Hospital Authority and DH are received. Otherwise, the following request forms are available for use:

DH2546	:	For chargeable investigations
Appendix 1	:	For laboratory isolates referred for identification, typing or other investigations
Appendix 2	:	For carbapenemase-producing Enterobacteriaceae isolates referred for characterization
Appendix 3	:	For susceptibility test request on Non-tuberculous Mycobacteria (NTM)

(a) The following information must be available before the sample can be processed and the appropriate tests performed:
   - Full patient particulars (name, date of birth / age, sex, identity document number)
   - Clinic / institution registration number
   - Requesting unit
   - Onset date of illness (if known)
   - Clinical diagnosis and / or specific clinical features
   - Antibiotics that the patient is taking, if any
   - Date and time of specimen taking

- Nature of specimen, including anatomic site of origin
- Test requested
- Signature (for non-electronically generated request forms) and name of requesting staff

(b) The specimen container must be labelled with unique identification of the patient (e.g. Hong Kong Identity Card / HKID number, clinic reference number) matching that on the request form.

7 Transport of specimens

(a) The following triple packaging system shall be used:
   i. The primary container containing the specimen is watertight, leakproof, and properly and securely capped or screwed.
   ii. A second leakproof container is used to protect the primary container. Laboratory test request forms are placed outside the secondary container, using a separate plastic bag.
   iii. The third layer of outer packaging / container (transport box) has adequate strength for its capacity and intended use, and can be readily cleansed and disinfected.
   iv. Specimens are kept upright during transport to minimize the possibility of spillage.

(b) The specimen transport box shall bear the biohazard warning label.

8 Acceptance and rejection of specimens

Criteria for acceptance and rejection of specimens are established to ensure quality of results affecting patient management and safety to personnel.

Common causes of specimen rejection include:
- Spillage
- Specimen collected in inappropriate container
- Unlabelled specimen
- Wrong specimen type
- Test not available
- Quantity insufficient
- Duplicated / repeated request within short intervals
- Unmatched information between specimen and request form

9 Average turnaround times (TATs)

(a) Refer to Table 1.

(b) The TATs serve only as a general reference. In case confirmatory tests are required, the TAT may be lengthened accordingly.

(c) Reports are normally despatched to requesting units through automated facsimile server in multiple batches per day.

(d) For urgent requests, please contact medical staff for special arrangements.

10 Requests for additional tests

(a) Additional tests on specimens previously sent to the laboratory may be requested via telephone followed by written request via facsimile as necessary.

(b) Such tests will be performed on the following conditions:
- Test(s) requested by a medical staff
- Test(s) appropriate to clinical indications
- Sufficient amount of the appropriate sample available in the laboratory
- Test results not affected by storage

11 Procedures for handling feedback and complaints

Please refer to https://www.dh.gov.hk/english/contactus/contactus_cru.html

Table 1: Average TAT of common tests

In general, the average TAT of common diagnostic tests (including microscopy, antigen detection and nucleic acid detection) and antenatal serological screening is 1 working day and the frequency of testing is daily. Other tests are performed daily. Exceptions are presented in the following table:

Category	**Test**	**Testing duration (working days)**	**Frequency of test**
Direct detection	Nucleic acid detection on respiratory specimens for atypical pneumonia	1 day	Twice per week
	Nucleic acid detection on plasma for HIV-1 RNA quantitation	1 day	Twice per week
	Nucleic acid detection on stool for *Clostridium difficile* toxin	1 day	Once per week
	Nucleic acid detection on serum/ plasma for Parvovirus-B19	1 day	Twice per week
Culture	Blood / CSF / body fluids for bacterial culture	7 days	Daily
	Other specimens for general bacterial culture	2-3 days	Daily
	Fungal culture	1-2 weeks	Daily
	Mycobacterial culture	6-8 weeks	Daily
	Cytomegalovirus DEAFF test	4 days	Daily
	Conventional culture for other common viruses	10 days	Daily
Serological tests	Bacterial / fungal / amoebic serology	2-3 days	Once per week
	IgM test for measles / rubella virus	1 day	Twice per week
	Viral serology for other viruses	2-4 days	1-2 times per week

Appendix 1

Microbiology Division, Public Health Laboratory Services Branch (PHLSB)
Centre for Health Protection, Department of Health, HKSAR

Referral Form for Identification / Characterization of Culture Isolates

Date: _____

Referring hospital: _____

Requesting doctor: _____

Patient identifier: (OR Gum label)
Name _____
Sex / age _____
HKID no. _____

Contact phone no.: _____ Your lab. no: _____

Clinical information:

Clinical diagnosis: _____ Onset date of illness: _____

Details of request:

Specimen site: _____ Date of collection: _____

Test requested*: Identification / Others: _____

Medium sent: Name: _____ Incubated for: _____ hours

Incubation*: Aerobic / MICROaerophilic / ANaerobic

Preliminary laboratory findings:

Gram stain morphology: _____

MALDI-TOF ID: _____ Log score / Confidence: _____ *BioTyper / VITEK MS

Presumptive identification of isolate: _____

Other relevant information: _____

*Please circle

Appendix 2

Microbiology Division, Public Health Laboratory Services Branch (PHLSB)
Centre for Health Protection, Department of Health, HKSAR

Referral Form for Carbapenemase-Producing *Enterobacteriaceae* Isolates (except *Proteus*, *Providencia* and *Morganella* spp.)

Date : _____

Referring hospital : _____

Requesting doctor: _____

Patient identifier: (OR Gum label)
Name _____
Sex / age _____
HKID no. _____

Contact phone no.: _____ Your lab. no: _____

Clinical information:

Clinical diagnosis: _____ Onset date of illness: _____

Infection status*: Colonization / Infection Fatal case*: Yes / No

Referred isolate:

Specimen site: _____ Date of collection: _____

Identification of isolate: _____

Preliminary laboratory findings:

Susceptibility and combined disc tests:

	Zone diameter (mm)			MIC (μg/mL) (Optional)
	No inhibitor	+ BA	+ EDTA	
Meropenem (MEM)				
Ertapenem (ERT)				
Imipenem (IMI)				

Modified Carbapenem Inactivation Method*: Positive / Negative	Carba NP Test*: Positive / Negative
CARBA-5 lateral flow assay result:	Molecular result:

Other relevant information: _____

* Please circle

Appendix 3

Microbiology Division, Public Health Laboratory Services Branch (PHLSB)
Centre for Health Protection, Department of Health, HKSAR

Request Form for Susceptibility Test on Non-tuberculous Mycobacteria (NTM)

Date: _____

Referring hospital: _____

Requesting doctor: _____

Contact phone no.: _____

Patient identifier: (OR Gum label)

Name _____

Sex / age _____

HKID no. _____

Signature: _____

A. Details of request:

Identity of NTM isolated: _____ Specimen type: _____

DH Laboratory no.(s): _____ Date(s) of collection: _____

Specific drugs for susceptibility testing (if any): _____

Reminders:
- *Susceptibility testing should only be carried out when there is clinical suspicion of disease.*
- *Single positive culture from non-sterile site specimen is not diagnostic for NTM disease and could be due to environmental contamination.*
- *Susceptibility testing is not routinely performed for species of low pathogenicity, e.g. M. gordonae.*

B. Clinical information:

Clinical diagnosis: _____ Onset date of illness: _____

Features suggestive of NTM disease: _____

_____

Radiological findings (if any): _____

_____

Other relevant information (e.g. past medical history, treatment history): _____

_____

Notes: *1. This form should be filled in by the doctor in-charge.*
2. Please fax the completed form with a copy of the laboratory report to Mycobacteriology laboratory, PHLSB, at 2776 0344.
3. Susceptibility testing will be considered based on the above information. Please ensure accuracy of information provided as it will constitute part of medical record.