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# SPECIMEN COLLECTION AND TRANSPORT FOR RESPIRATORY DISEASES

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CLINICAL MICROBIOLOGIST

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# INTRODUCTION

- The laboratory diagnosis of an infectious disease begins with the collection of a clinical specimen for examination or processing in the laboratory (the right one, collected at the right time, transported in the right way to the right laboratory).
  - Proper collection of an appropriate clinical specimen is the first step in obtaining an accurate laboratory diagnosis of an infectious disease.
  - Guidelines for the collection and transportation of specimens should be made available to clinicians in a lucidly written format. CDL HANDBOOK
  - google – pathologyuitm.weebly → pathologyUITM
  - <https://pathologyuitm.weebly.com>
  - **The guidelines must emphasize two important aspects:**
  - Collection of the specimen before the administration of antimicrobial agents.
  - Prevention of contamination of the specimen with externally present organisms or normal flora of the body.
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# COLLECTION AND TRANSPORTATION OF SPECIMENS

- Apply strict aseptic techniques throughout the procedure.
  - Wash hands before and after the collection.
  - Collect the specimen at the appropriate phase of disease.
  - Make certain that the specimen is representative of the infectious process (e.g. sputum is the specimen for pneumonia and not saliva) and is adequate in quantity for the desired tests to be performed.
  - Collect or place the specimen aseptically in a sterile and/or appropriate container.
  - Ensure that the outside of the specimen container is clean and uncontaminated.
  - Close the container tightly so that its contents do not leak during transportation.
  - Label and date the container appropriately and complete the requisition form.
  - Arrange for immediate transportation of the specimen to the laboratory.
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# CRITERIA FOR REJECTION OF SPECIMENS

- Criteria should be developed by a laboratory on the basis of which the processing of a specimen may not be done by the laboratory. The following are some examples:
  - Missing or inadequate identification.
  - Insufficient quantity.
  - Specimen collected in an inappropriate container.
  - Contamination suspected.
  - Inappropriate transport or storage.
  - Unknown time delay.
  - Hemolysed blood sample.
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# TEST AVAILABLE IN CDL FOR RESPIRATORY DISEASE

DISEASE	TEST	SPECIMEN REQUIRED
UPPER RESPIRATORY TRACT DISEASES		
Bacterial pharyngitis( group A streptococcus)	Culture and sensitivity	throat swab/NPS
LOWER RESPIRATORY TRACT DISEASES		
Bacterial pneumonia	Culture and sensitivity	sputum, tracheal secretion, ETT secretions, bronchoscopy specimens

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DISEASE	TEST	SPECIMEN REQUIRED
Tuberculosis	Sputum for AFB	Sputum & other clinical specimen
	MTB GeneXpert (rapid molecular)	Sputum/ BAL/ Tracheal aspirate/ CSF/ Body fluid
COVID 19	RTK antigen test	Nasopharyngeal swab
	Covid GeneXpert (rapid molecular)	Nasopharyngeal /Oropharyngeal swab
	SARS CoV 2 RNA	Nasopharyngeal /Oropharyngeal swab

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# TEST FOR OUTSOURCE

DISEASE	TEST	SPECIMEN	DESTINATION
TB	TB Culture & Sensitivity	Sputum & other clinical specimen	UMMC /LABLINK
Atypical pneumonia	<i>Chlamydophila pneumoniae</i> / <i>C.trachomatis</i> / <i>C.psittaci</i> antibody	Blood	GRIBBLES
	<i>Legionella</i> Antigen	Urine/Blood	HOSP. SG.BULOH/LABLINK
	Mycoplasma Antibody	Blood	LABLINK /HOSP. SG.BULOH
	Coxiella Burnetti Antibody	Blood	GRIBBLES

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LRTI (VIRUS)	Adenovirus Antigen ( IF)	Sputum/tracheal aspirates/NPA/BAL	HOSP. SG.BULOH
	Respiratory Syncytial Virus Antigen (IF)	Sputum/tracheal aspirates/NPA/BAL	HOSP. SG.BULOH
	Influenza A, B,,C Virus Antigen (IF)	Sputum/tracheal aspirates/NPA/BAL	UMMC
LRTI (FUNGAL)	<i>Pneumocystis jirovecii</i> molecular	Sputum/tracheal aspirates/NPA/BAL Throat swab	Geneflux

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# SPECIMEN COLLECTION

- Must be collected correctly
  - If not, may not grow in culture:
    - -Contaminants may be mistakenly identified
    - -Patient may receive incorrect or harmful therapy
  - Collect from appropriate site
  - Obtain specimen at correct time
  - Use appropriate devices
  - Obtain sufficient quantity of specimen
  - Obtain specimen prior to the start of antimicrobial therapy
  - Label correctly
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# THROAT SWAB (POSTERIOR PHARYNGEAL SWAB)

Hold tongue away with tongue depressor

Locate areas of inflammation and exudate in posterior pharynx, tonsillar region of throat behind uvula

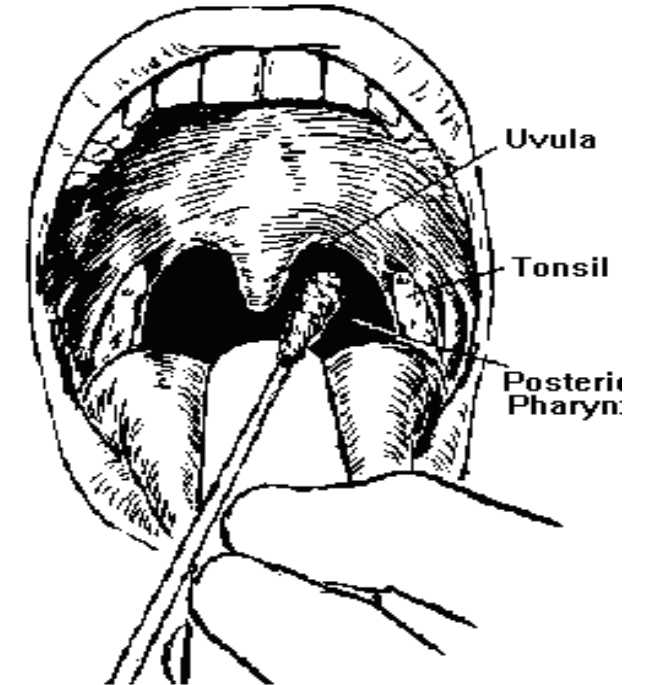
Avoid swabbing soft palate; do not touch tongue

Rub area back and forth with cotton or Dacron swab

Amies transport medium

Send within 2-4 hours

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WHO/CDS/EPR/ARO/2006.1

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# NASOPHARYNGEAL SWAB

Tilt head backwards

Insert flexible fine-shafted polyester swab into nostril and back to nasopharynx

Leave in place a few seconds

Withdraw slowly; rotating motion

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# NASO-PHARYNGEAL ASPIRATE

Tilt head slightly backward

Instill 1-1.5 ml of VTM /sterile normal saline into one nostril

Use aspiration trap

Insert silicon catheter in nostril and aspirate the secretion gently by suction in each nostril



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# SPUTUM

## Collection

Instruct patient to take a deep breath and cough up sputum directly into a wide-mouth sterile container

- avoid saliva or postnasal discharge
- 1 ml minimum volume

## Sputum fo AFB

- Three (3) consecutive morning sputum should be collected as the specimen of choice.
- Sputum is expectorated directly into a sterile container.



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# TRANSPORTATION OF SPECIMENS

- In general, specimens may be sent to the microbiology laboratory in sterile, leak-proof containers enclosed within leak-proof, sealed plastic bags.
  - For infectious substances – triple layer packaging
  - In general, most specimens should be processed in the laboratory within 1 to 2 hours after collection.
  - In practice, a 2-to 4-hour time limit is probably more practical during a normal working day.
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# TRANSPORT MEDIUM

- Transport medium is a safe and an appropriate way of carrying the clinical specimens from distances (long or short) for transporting to the lab for examination.
  - It allows organisms to survive.
  - It does not allow organisms to proliferate
  - Examples: For bacteria – Cary Blair / Amies transport medium
  - For viruses – virus transport media (VTM)
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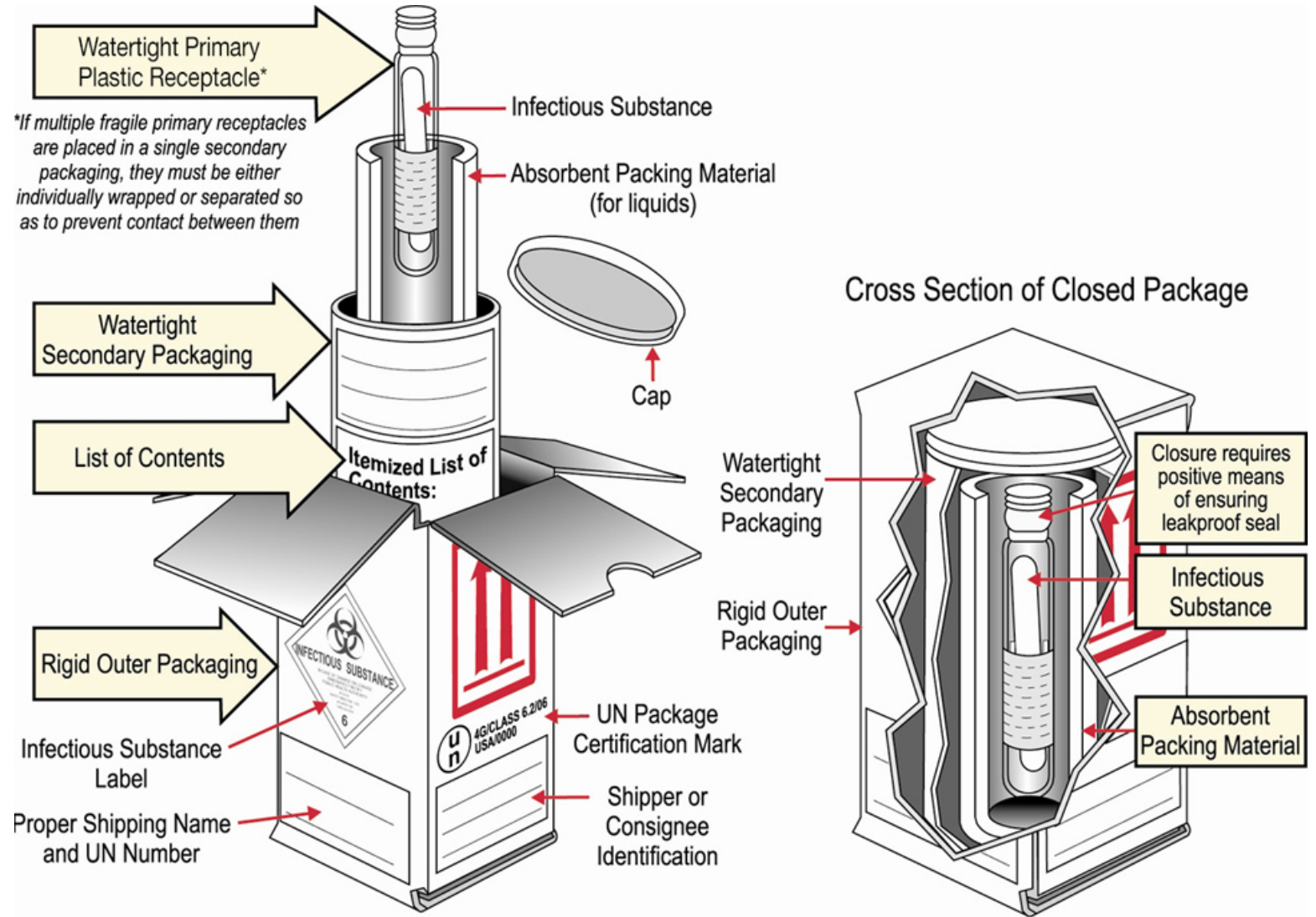
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# TRANSPORT MEDIUM

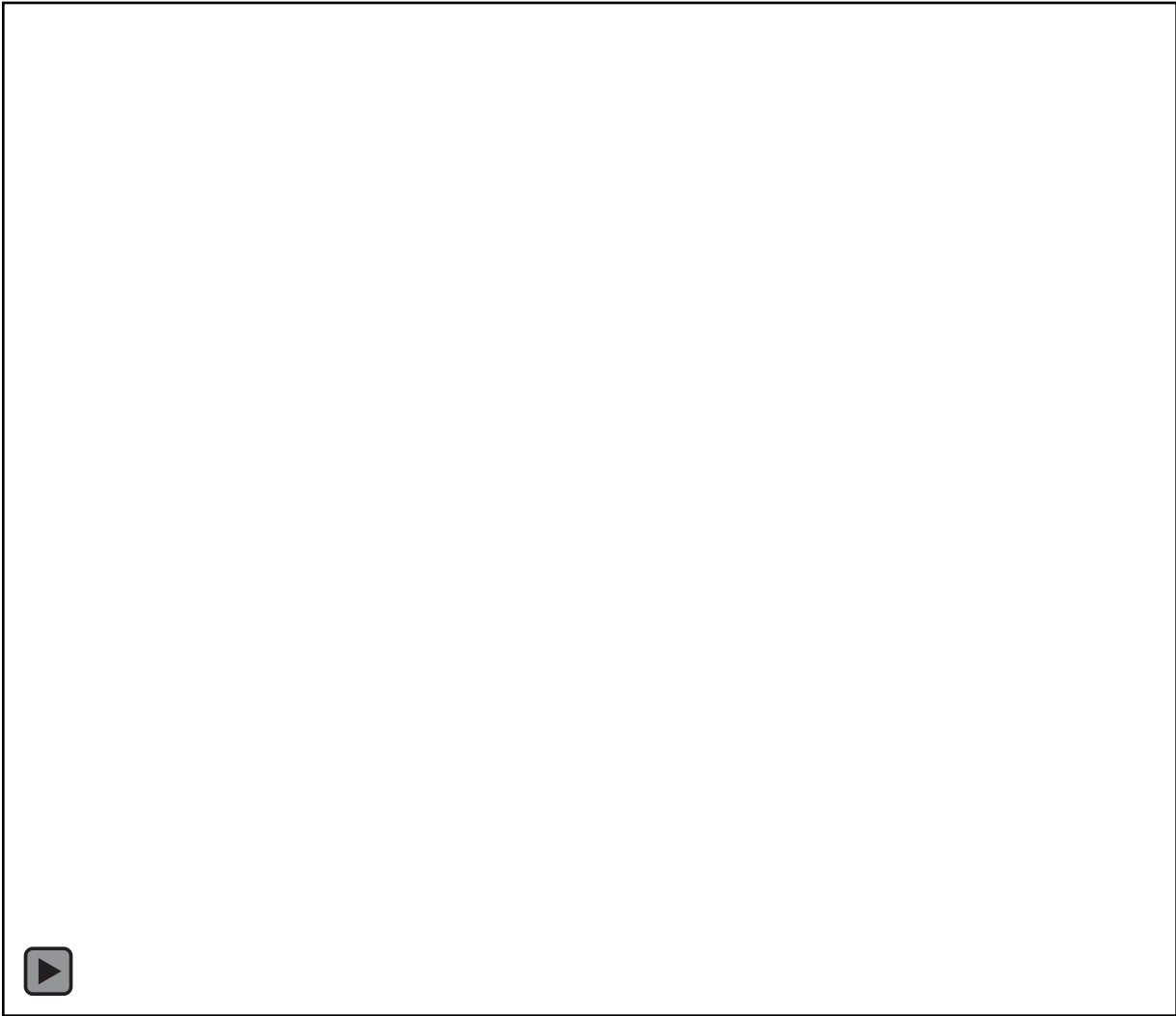
Viral Transport Media  
(VTM)



# TRIPLE LAYER PACKAGING







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# SPECIMEN TRANSPORT

DISEASE	TEST	SPECIMEN REQUIRED	VOLUME REQUIRED	SPECIMEN CONTAINER	INSTRUCTION
UPPER RESPIRATORY TRACT DISEASES					
Bacterial pharyngitis( group A streptococcus)	Culture and sensitivity	throat swab/NPS	Not applicable	Amies Transport Medium	Send within 2-4 hours.
LOWER RESPIRATORY TRACT DISEASES					
Pneumonia	Culture and sensitivity	sputum, tracheal secretion, ETT secretions, bronchoscopy specimens	Not applicable	Sterile	Send within 2-4 hours.

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DISEASE	TEST	SPECIMEN REQUIRED	VOLUME REQUIRED	SPECIMEN CONTAINER	INSTRUCTION
Tuberculosis	Sputum for AFB	Sputum & other clinical specimen	3ml	Sterile	Collect 3 consecutive early morning (fresh) sputum (Not Saliva) .
	MTB GeneXpert (rapid molecular	Sputum/ BAL/ Tracheal aspirate/ CSF/ Body fluid	Not applicable	Sterile/universal container	Send immediately
COVID 19	RTK antigen test	Nasopharyngeal swab	Not applicable	Transport swab/Falcon tube	Transportation with triple packaging /ice pack. Sample must reach within 4 hours upon collection
	Covid GeneXpert	Nasopharyngeal /Oropharyngeal swab	Not applicable	VTM	Specimen should be in triple packaging and transported with ice pack to the lab
	SARS CoV 2 RNA	Nasopharyngeal /Oropharyngeal swab	Not applicable	VTM	Transportation with triple packaging /ice pack.

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# TEST FOR OUTSOURCE

DISEASE	TEST	SPECIMEN	VOLUME REQUIRED	SPECIMEN CONTAINER	INSTRUCTION
TB	TB Culture & Sensitivity	Sputum & other clinical specimen	3 ML	Sterile	Complete PER PAT.301 form and send it along with sample within 2-4 hours.
Atypical pneumonia	<i>Chlamydophila pneumoniae</i> / <i>C.trachomatis</i> / <i>C.psittaci</i> antibody	Blood	5ml	Gel tube	Complete PER PAT.301 form and send it along with sample within 2-4 hours.
	<i>Legionella</i> Antigen	Urine	5ml	Sterile	Complete PER PAT.301 form and send it along with sample within 2-4 hours
	Mycoplasma Antibody	Blood	5 ml	Gel tube	Complete PER PAT.301 form and send it along with sample within 2-4 hours
	Coxiella Burnetti Antibody	Blood	5 ml	Gel tube	Complete PER PAT.301 form and send it along with sample within 2-4 hours

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LRTI (VIRUS)	Adenovirus Antigen ( IF)	tracheal aspirates/NPA/BAL	Not applicable	Sterile	Complete PER PAT.301 form and send it along with sample within 2-4 hours
	Respiratory Syncytial Virus Antigen (IF)	tracheal aspirates/NPA/BAL	Not applicable	Sterile	Complete PER PAT.301 form and send it along with sample within 2-4 hours
	Influenza A, B,,C Virus Antigen (IF)	tracheal aspirates/NPA/BAL	Not applicable	Sterile	Complete PER PAT.301 form and send it along with sample within 2-4 hours
LRTI (FUNGAL)	<i>Pneumocystis jirovecii</i> molecular	BAL Throat swab	1-3ml	Sterile VTM	Transport in Ice



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# REQUEST FOR TEST

- All inhouse tests -through UNIMEDS
  - Outsource tests –**MUST** through UNIMEDS & fill in **KKM standard form PER PAT-301 (however certain test e.g molecular for gene flux must use a special form) – need to call MLT.**
  - TB culture fill in PER PAT form only, x PPUM form
  - If not sure of the availability of the test requested please refer handbook or call the lab for assistance.
  - **common mistakes**
  - Each test requested through UNIMEDS must be in a separate form except for serology (HIV, HepB &C)
  - Please write the diagnosis & brief clinical history and type of sample/specimen on the form.
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**MEDICAL MICROBIOLOGY REQUEST FORM**

UiTM/FPR/CPDRL/QP-11/IF-03  
 MM119564  
 FOR LAB USE ONLY

Name : MOHAMMAD AKBAR JAVED  
 Reg No : CTC0039588  
 I/C No :  
 DOB : 30-05-1971  
 Age : 48y 1m 15d  
 Race : Others  
 Gender : MALE  
 App.Date (Specimen) : N/A  
 Remark :  
 Clinical History : coros

Clinic / Ward : SBC - Inpatient  
 Date of Admission / Clinic :  
 Appointment :  
 Requested By : DR. MUZZAMMIL MOHD KHAIRI  
 Ordered Date/Time : 15-07-2019 11:56  
 Consultant in Charge :

No	Test Name	Specimen	Location	Priority
1	HEPATITIS B SURFACE ANTIGEN (HBSAG)	BLOOD	CPDRLSB	Routine
2	HEPATITIS C ANTIBODY (ANTI-HCV)	BLOOD	CPDRLSB	Routine
3	HUMAN IMMUNODEFICIENCY VIRUS 1 & 2 ANTIBODY (HIV A)	BLOOD	CPDRLSB	Routine

Specimen Collection : 15-07-2019 11:58:44  
 Sample Taken by / Printed by : NAZIATUNHASNIZA MAT SARAH  
 Sample Taken at : SBC - Phlebotomy Ward 1

TERIMA15JUL'19 2:42PM



**URGENT**

**MEDICAL MICROBIOLOGY REQUEST FORM**

UiTM/FPR/CPDRL/QP-11/IF-03  
 MM119824  
 FOR LAB USE ONLY

FL-19-55

Name : ELLEMY ISKANDAR BIN KHALID  
 Reg No : CTC0032440  
 I/C No : 750217035347  
 DOB : 17-02-1975  
 Age : 44y 4m 27d  
 Race : Malay  
 Gender : MALE  
 App.Date (Specimen) : N/A  
 Remark :  
 Clinical History : pleural effusion post CABG  
 post chest tube = haemorrhagic fluid  
 completed IV tazosin 2 weeks

Clinic / Ward : SBC - Inpatient  
 Date of Admission / Clinic :  
 Appointment :  
 Requested By : DR. OZAIR MOHD ALI  
 Ordered Date/Time : 16-07-2019 12:13  
 Consultant in Charge :

No	Test Name	Specimen	Location	Priority
1	CULTURE AND SENSITIVITY (C&S)	PLEURAL	CPDRLSB	URGENT

Specimen Collection : 16-07-2019 12:15:04  
 Sample Taken by / Printed by : NORHIRMAWATI MOHD TAHIR  
 Sample Taken at : SBC - Phlebotomy Ward 2

TERIMA16JUL'19 2:37PM

**MEDICAL MICROBIOLOGY REQUEST FORM**

UITM/FPR/CPDRL/QP-11/IF-03  
MM117891  
FOR LAB USE ONLY

FL-19-52

Name : NINA MOHAMED BIN MEERALAVAY  
 Reg No : LTC0014034  
 I/C No : 570109105063  
 DOB : 09-01-1957  
 Age : 62y 5m 23d  
 Race : Malay  
 Gender : MALE  
 App.Date (Specimen) : N/A  
 Remark :  
 Consultant in Charge : DR. AHMAD FIRDAUS ZAKARIA

Clinic / Ward : SBC - Inpatient

Date of Admission / Clinic Appointment :  
 Requested By :  
 Ordered Date/Time : 04-07-2019 15:55

Clinical History : 62 years old malay man

HOP1  
 abd distension and discomfort  
 a/w leg swelling  
 reduce ET  
 + orthopnea  
 for 4/12

No	Test Name	Specimen	Location	Priority
1	CULTURE AND SENSITIVITY - FLUID WITH FEME	PERITONEAL	CPDRLSB	Routine
2	FEME (PERITONEAL)	PERITONEAL	CPDRLSB	Routine
3	ACID FAST BACILLI (AFB) / ZIEHL-NEELSON (ZN) STAIN	PERITONEAL	CPDRLSB	Routine
4	TB CULTURE & SENSITIVITY	PERITONEAL	UMMC	Routine

Specimen Collection : 04-07-2019 15:58:35  
 Sample Taken by / Printed by : NORLIZA ROSLI  
 Sample Taken at : SBC - Phlebotomy Ward 1

TERIMA 4JUL'19 4:09PM

**MEDICAL MICROBIOLOGY REQUEST FORM**

UITM/FPR/CPDRL/QP-11/IF-03  
MM1163  
FOR LAB USE ONLY

FC-19-48

Name : SHARIEFA RODZIAH BINTI M SAMSUDEEN  
 Reg No : 1810116954  
 I/C No : 641108025286  
 DOB : 08-11-1964  
 Age : 54y 7m 16d  
 Race : Malay  
 Gender : FEMALE  
 App.Date (Specimen) : N/A  
 Remark :  
 Consultant in Charge : DR. MEERA KUPPUSAMY

Clinic / Ward : SBC - Dermatology Clinic

Date of Admission / Clinic Appointment :  
 Requested By :  
 Ordered Date/Time : 26-06-2019 08:22

Clinical History : skin scraping from right sole for fungal c& s  
 imp: tro tinea pedis

No	Test Name	Specimen	Location	Priority
1	FUNGAL CULTURE	-NA-	CPDRLSB	Routine

Specimen Collection : 26-06-2019 08:49:45  
 Sample Taken by / Printed by : SITI SUWARNIE CHE SOH@YUSOFF  
 Sample Taken at : SBC - Phlebotomy Clinic 2

TERIMA 26JUN'19 10:50

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# QUIZ TIME

1. Why is a proper collection of clinical specimen important in laboratory investigation ? Give 2 general guideline on sample collection and transport of specimens.
  2. What are the tests available for COVID-19 and what specimen you should send to the lab?
  3. What is the purpose of transport media. Give 2 examples.
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THANK YOU !

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