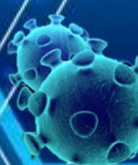




JABATAN
PATOLOGI & TRANSFUSI
HOSPITAL KULIM

HOSPITAL KULIM PATHOLOGY & TRANSFUSION SERVICES HANDBOOK 2023



FOREWORD



**Director
Hospital Kulim, Kedah**

It is with great pleasure to introduce this comprehensive handbook guideline on pathology services within our esteemed hospital. Pathology lies at the heart of modern healthcare, serving as the cornerstone for accurate diagnosis, effective treatment planning, and ongoing patient care. As such, a resource that outlines best practices, protocols, and standards in this critical field is invaluable to both seasoned practitioners and aspiring professionals alike.

In an era defined by rapid advancements in medical technology and evolving healthcare landscapes, the need for reliable guidelines to ensure consistent and high-quality pathology services has never been more pronounced. This handbook stands as a testament to our commitment to excellence in patient care, providing a roadmap for delivering pathology services that meet the highest standards of accuracy, efficiency, and compassion.

I commend the authors for their dedication and expertise in compiling this handbook, drawing upon years of experience and insight to address the myriad complexities and challenges inherent in pathology practice. Their meticulous attention to detail and commitment to evidence-based recommendations ensure that this handbook serves as an indispensable resource for pathologists, laboratory technicians, healthcare administrators, and other stakeholders involved in the delivery of pathology services.

I would also like to extend my heartfelt appreciation to the entire pathology team whose tireless efforts and unwavering dedication continue to drive excellence in patient care. It is through their collective expertise and commitment to continuous improvement that our hospital remains at the forefront of medical innovation and compassionate healthcare delivery.

In closing, I am confident that this handbook will serve as a valuable companion to all those involved in pathology services, empowering them to navigate the complexities of this vital field with confidence and proficiency. May it inspire excellence, foster collaboration, and ultimately, enhance the quality of care we provide to our patients.


DR MOHD RUHAIFI BIN ALI
Director,
Hospital Kulim, Kedah

FOREWORD



**Head of Department
Pathology and Transfusion Department**

Assalamualaikum wbt. Alhamdulillah, thanks to Allah, we finally successfully completed the first edition of our laboratory handbook this year. My congratulations and thanks go to the members of the editorial board and heads of units for their hard work and dedication in completing this handbook.

This handbook outlines the pathology services provided by this department, the list of tests, type of specimen required, specimen collection, specimen transportation, turnaround time (TAT) and rejection criteria. Each laboratory section has details about the services offered by the laboratory and some specific requirements depending on the examination requested. It is produced to help the hospital staff and all the clinic staff surrounding us make the best use of the pathology and transfusion services.

This handbook is also to be considered a service agreement between the Pathology and Transfusion Department of Hospital Kulim and its customers. Lastly, I hope that this department will continue to provide the best service to all its customers. Thank you.

A handwritten signature in black ink, appearing to read 'Siti Aisyah'.

DR SITI AISYAH BINTI ABDUL GHANI
Pathologist (Haematology),
Head of Department,
Pathology and Transfusion Department,
Hospital Kulim, Kedah

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First Edition
August 2023

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All staffs of Pathology and Transfusion Department Hospital Kulim who directly & indirectly involved in production of this handbook.

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INTRODUCTION

VISION, MISSION & CLIENT CHARTER PATHOLOGY & TRANSFUSION DEPARTMENT

VISION

To be a center that provide a good quality diagnostic pathology and transfusion services.

MISSION

To provide an excellent diagnostic pathology and transfusion services for all clients according to the standard by implementing systematic workflow, automated and cost effective laboratory technique, professionalism and effective communications by using the latest technology.

CLIENT CHARTER

- ◆ To provide our clients with friendly, fair and appropriate services
- ◆ To provide clear and complete explanation for all the tests when needed
- ◆ To process all specimens according to the standard operating procedures
- ◆ To produce accurate and reliable result in timely manner
- ◆ To maintain confidentiality and secrecy of all patient's information

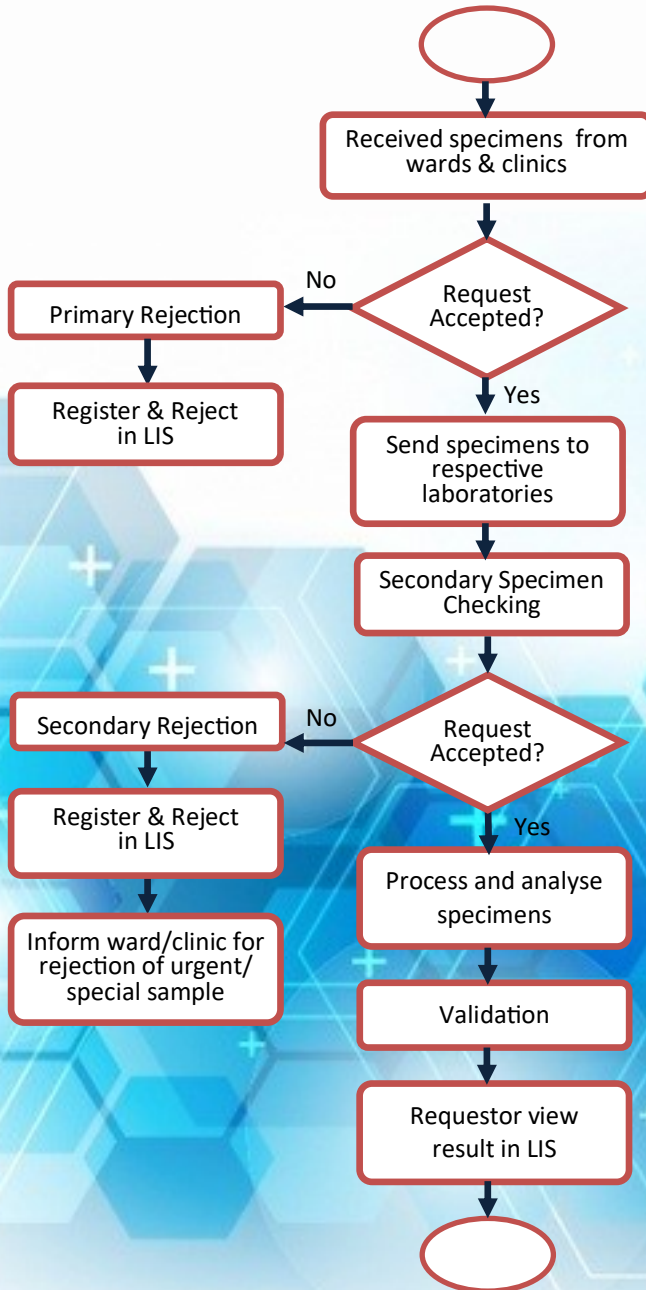
ORGANISATION CHART



LIST OF CONTACT NUMBERS

Location	Extension Number
Head of Pathology & Transfusion Department	3180
Pathology Administration Office	
1. Senior MLT 2. Administrative Assistant	3181
Pathology Main Counter	
1. Medical Laboratory Technologist (MLT In charge Histopathology Specimen) 2. Healthcare Assistant	3179
Haematology Unit	
Head of Haematology Unit Pathologist (Haematology)	3559
Haematology Laboratory	3184
Chemical Pathology Unit	
Head of Chemical Pathology Unit Pathologist (Chemical Pathology)	3189
Scientific Officer (Biochemistry)	3561
Chemical Pathology Laboratory	3187
Medical Microbiology Unit	
Head of Medical Microbiology Unit Pathologist (Medical Microbiology)	3189
Scientific Officer (Microbiology)	3561
Laboratory (Bacteriology/Mycology/Cytology)	3190
Laboratory (Serology/Immunology)	3301
Transfusion Unit	
Head of Transfusion Unit Transfusion Medicine Specialist	3123
Medical Officer	3186
Transfusion Laboratory	3185
Blood Donor Counter	3122

GENERAL WORKFLOW OF PATHOLOGY & TRANSFUSION DEPARTMENT



GENERAL OPERATING POLICIES

GENERAL OPERATING POLICIES

1. INTRODUCTION

The Department of Pathology and Transfusion of Kulim Hospital is a department that provides diagnostic testing services, transfusion medicine as well as consulting services to specialists, medical officers and paramedics from Kulim Hospital, district hospitals and nearby health clinics.

2. LOCATION

The Department of Pathology and Transfusion is located at ground floor, next to Physiotherapy Unit and opposite to Klinik Pakar 1.

3. FUNCTION

3.1 To provide diagnostic services in the field of Chemical Pathology, Hematology, Medical Microbiology and Transfusion Medicine. These services are provided to Hospital Kulim, Hospital Baling, health clinics, other government agencies and private health institutions.

3.2 To provide advisory and consultancy services to clients in matters related to Pathology services.

3.3 To provide training in technical and analytical skills for laboratory personnel and staff from other hospitals, health clinics, institution of higher learning and private health institutions.

3.4 To involve in collaborative research and development in Pathology and other relevant clinical fields.

3.5 To assist client in referring or outsourcing test to respective referral laboratories.

4. SCOPE OF SERVICES

The Department of Pathology & Transfusion provides the following services:

UNIT	SCOPE
Chemical Pathology	Routine Chemical Pathology and selected special test.
Hematology	Routine Hematology, Coagulation and selected special test.
Medical Microbiology	Diagnostic Bacteriology, Serology, Immunology, Virology Screening, Parasitology, Mycology and Environmental & Product Screening.
Blood Transfusion	Immunoematology tests and supply of blood products.
Histopathology/ Cytology	Referred to Hospital Sultan Abdul Halim, Sungai Petani.








5.SERVICE HOURS

LOCATION	SERVICE HOURS
Pathology Administration Office	8:00am-5.00pm (Sun-Wed)* 8.00am-3.30pm (Thurs)*
Pathology Main Counter	24 hours
Unit Counter (Chemical Pathology/ Haematology, Transfusion)	8:00am-5.00pm(Sun-Wed)* 8.00am-3.30pm(Thurs)*
Chemical Pathology Laboratory	24 hours
Haematology Laboratory	24 hours
Medical Microbiology Laboratory	24 hours
Transfusion Laboratory	24 hours

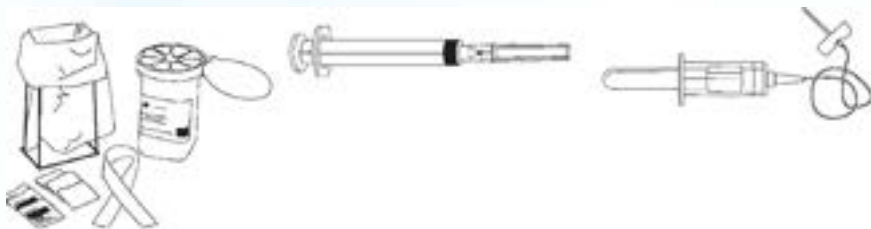
**excluding public holidays*

GUIDELINES FOR BLOOD COLLECTION TUBE AND ORDER OF DRAW

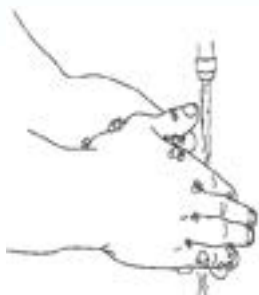
To avoid cross contamination, blood must be drawn and collected in tubes in a specific order. This is known as the Order of Draw. Draw volume and number of inversion are of critically important and clinically significant.

ORDER OF DRAW	BLOOD COLLECTION TUBE	MIX BY INVERSION
1	 <p style="margin-left: 20px;">BLOOD CULTURE BOTTLE</p>	8-10 TIMES
2	 <p style="margin-left: 20px;">SODIUM CITRATE TUBE (LIGHT BLUE)</p>	3-4 TIMES
3	 <p style="margin-left: 20px;">GEL SEPARATOR TUBE (YELLOW)</p>	5 TIMES
	 <p style="margin-left: 20px;">PLAIN TUBE (RED)</p>	
4	 <p style="margin-left: 20px;">HEPARIN TUBE (GREEN)</p>	8-10 TIMES
5	 <p style="margin-left: 20px;">EDTA TUBE (LAVENDER)</p>	8-10 TIMES
6	 <p style="margin-left: 20px;">FLUORIDE TUBE (GREY))</p>	8-10 TIMES

ILLUSTRATIONS FOR BEST PRACTICES IN PHLEBOTOMY IN ADULTS



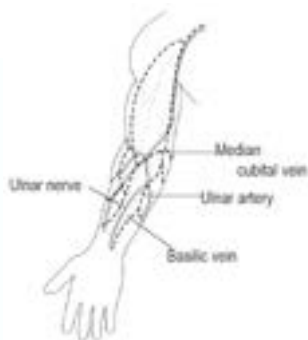
1) Assemble equipment and include needle and syringe or vacuum tube, depending on which to be used.



2) Perform hand hygiene.



3) Identify and prepare the patient.



4) Select the site, preferably at the antecubital area (i.e. the bend of the elbow). Palpate the area to locate the anatomic landmarks. **DO NOT** touch the site once antiseptic has been applied.



5) Apply tourniquet, about 4 to 5 finger widths above the selected venipuncture site.



6) Ask patient to form a fist, so that the veins are more prominent.



7) Put on well-fitting, non-sterile gloves.



8) Disinfect the site using 70% isopropyl alcohol for 30 seconds and allow to dry completely.



9) Anchor the vein by holding the patient's arm and placing a thumb BELOW the venipuncture



10) Enter the vein swiftly at 30 degree angle



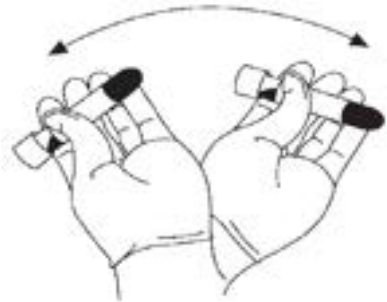
11) Once sufficient blood has been collected, release the tourniquet **BEFORE** withdrawing the needle.



12) Withdraw the needle gently and give the patient a clean gauze or dry cotton-wool ball to apply to the site with gentle pressure.



13) Fill the withdrawn blood in tube by piercing the needle through the rubber stopper. If the tube does not have a rubber stopper, press the plunger in slowly to reduce hemolysis (this is safer than removing the needle).



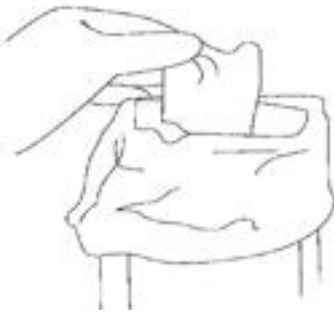
14) Following laboratory instructions, invert the sample gently to mix the additives with the blood before dispatch.



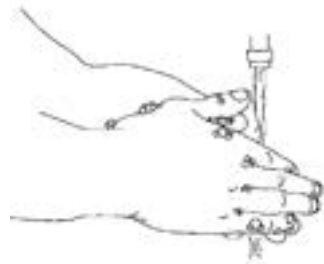
15) Label the specimen container and check for accuracy.



16) Discard the used needle and syringe into a sharp bin.



17) Place items that can drip blood or body fluids into the infectious waste.



18) Remove gloves and place them in the general waste. Perform hand hygiene.

Adapted from WHO Guidelines on Drawing Blood: Best Practices in Phlebotomy. Geneva: World Health Organization;2010. 2, Best practices in phlebotomy.

PRE-ANALYTICAL REQUIREMENTS

REQUEST FORM

A standard laboratory request form i.e PER. PAT 301 is used for all categories of tests except otherwise stated (refer individual sections). The following information must be completed on the request form:

SPECIMEN COLLECTION

Patient details	Name, Identity Card Number, Date of birth/Age and Gender
Location of Patient	Wards / Clinics / Hospitals / etc.
Patients clinical summary	Relevant clinical history, physical finding, investigation, provisional diagnosis and treatment.
Test name	Request must specify the test required.
Specimen	Date and time of specimen taken, specimen type and specimen body part taken (if necessary).
Requestor's detail	Doctor's name, signature and official stamp.

1. Specimen containers / bottles must be labelled with the patient's name, patient identification card number, date of sampling, test name and location.
2. Specimens must be placed in a biohazard bag and send to the lab with a request form.

SPECIMEN DELIVERY AND RECEIPT

1. All specimens must be sent immediately to the specific laboratory counter or Pathology main counter along with specimen dispatch book.
2. Sender shall obtain confirmation of acceptance of the specimen from the laboratory staff.
3. All specimens received will be checked and rejected if not fulfill the acceptance criteria.

SPECIMEN REJECTION CRITERIA

Primary Rejection

1. No specimen/request form received
2. Specimen leakage/spill
3. No/incomplete label of specimen/request form
4. Request form has been contaminated by specimens.

Secondary Rejection

1. All primary rejection criteria
2. Specimen clotted
3. Hemolysis /lipemic/icteric specimen
4. Insufficient / overfilled specimens for analysis
5. Suspect mixed up specimen/contamination
6. Wrong Container/Sample
7. Wrong request form
8. No signature or information of requestor
9. No date and time of specimen taken
10. Repeated request
11. Test not indicated
12. Test not offer
13. Test need appointment
14. Test suspended
15. Poor slide smear
16. Blood stained specimen
17. No clinical history and diagnosis
18. Inappropriate time interval
19. Information on form differ from specimen
20. Test name not specified

RESULTS/REPORTS

1. All laboratory results/reports will be released in the LIS system.
2. The results/reports have to be validated by authorized personnel (Medical Laboratory Technologist, Scientific Officers, Medical Officers, Pathologists/Specialists).
3. All critical results/reports will be notify by phone and documented in LIS.
4. All referral test results/reports will be uploaded in LIS system.
5. During down time / system offline, hardcopy of results will be made available for collection at pigeon hole.
6. Confidential results such as HIV results will be released in hardcopy format (sealed envelope) to the requestor.

REFERRAL OF TESTS

1. This department will refer certain tests which are not offered to the selected referral center.
2. Referral test shall be made possible between Ministry of Health (MOH) Laboratories.
3. If the scope of the tests is not available within MOH laboratories, outsourcing of service will be arranged with accredited non-MOH laboratories. The laboratory shall be responsible for facilitating the outsourcing process according to a standardized procedure.
4. All referral test request must go through Department of Pathology and Transfusion, Hospital Kulim.
5. The request form and specimen will be checked for completeness and suitability.

The schedule for sending the tests to referral laboratories/institutions is as follows:

REFERRAL LABORATORIES/ INSTITUTIONS	SENT OUT ON:
<p>Within Kedah State :</p> <ul style="list-style-type: none"> ◇ Hospital Sultanah Bahiyah ◇ Hospital Sultan Abdul Halim ◇ KK Bakar Arang* 	<p>Sunday, Tuesday and Thursday only (All HPE and cytology specimen will be sent everyday on working days) *Tuesday only</p>
<p>Outside Kedah State :</p> <ul style="list-style-type: none"> ◇ Hospital Seberang Jaya ◇ Hospital Tuanku Fauziah, Perlis ◇ Hospital Pulau Pinang ◇ Hospital Tunku Azizah, Kuala Lumpur ◇ Hospital Kuala Lumpur ◇ Hospital Sungai Buloh ◇ Hospital Selayang ◇ Hospital Putrajaya ◇ Hospital Ampang ◇ Jabatan Kimia Malaysia ◇ Institut Penyelidikan Perubatan (IMR) ◇ National Institute of Health (NIH, Setia Alam) ◇ Institut Perubatan dan Pergigian Termaju (IPPT), USM Bertam ◇ Makmal Kesihatan Awam, Ipoh ◇ Makmal Kesihatan Awam, Sungai Buloh ◇ Pusat Darah Negara ◇ PPUM ◇ PPUKM 	<p>Only on Monday or as needed</p>



LIST OF TESTS (INTERNAL)

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
1	ABO & Rh D Blood Grouping	EDTA tube	Adult : 5.0 mL. Infant : 1.0 mL. specimen from infant less than 4 month must be accompanied with mother's blood (5.0 mL)	24 hours	2 hours	PPDKS-Rin 1/2009 form is required. For infant, if maternal blood is unavailable, 3mL of infant blood in EDTA is required for testing	Transfusion
2	Acetaminophen (Paracetamol)	Plain tube (Red cap)	3.0 mL	24 hours	90 mins	Please use TDM request form. Call pharmacist ext: 3310 (office hour) /3255 (on call) before sent specimen.	Chemical Pathology
3	Acid Fast Bacilli (AFB) Direct Smear	Sterile container	NA	Daily	24 hours	Sputum is best collected early morning for 2 consecutive days. Repeated specimen will be accepted after 14 days of treatment (1 time only)	Microbiology
4	Activated Partial Thromboplastin Time (APTT)	Sodium Citrate tube	1 tube Paeds: 1.0 mL Adult: 1.8 mL	24 hours	Urgent : 1 hour Routine: 2 hours	Adequately filled to the level indicated on tube, thoroughly mix by inverting gently 3-4 times and Send immediately to the lab to the laboratory	Hematology

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
5	Air Sampling Culture	Agar plate	NA	Daily	4 days	Test done by appointment with Infection Control Unit	Microbiology
6	Alanine Transaminase (ALT)	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of LFT	Chemical Pathology
7	Albumin, Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of LFT	Chemical Pathology
8	Albumin, Body Fluid	Sterile container	3.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
9	Albumin/Globulin (A/G) Ratio	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	A/G ratio = Albumin divided by globulin	Chemical Pathology
10	Alkaline phosphatase (ALP)	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of LFT	Chemical Pathology
11	Ammonia	EDTA Tube	Adult: 4.0 mL Paeds: 0.5 mL	By appointment	90 mins	Call 3187/3188 before specimen collection. Sent immediately to the lab in ice.	Chemical Pathology
12	Amylase, Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
13	Albumin, Body Fluid	Body Fluid	Sterile container	3.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
14	Albumin/Globulin (A/G) Ratio	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	A/G ratio = Albumin divided by globulin.	Chemical Pathology
15	Alkaline phosphatase (ALP)	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of LFT.	Chemical Pathology
16	Ammonia	Blood	EDTA Tube	Adult: 4.0 mL Paeds: 0.5 mL	By appointment	90 mins	Call 3187/3188 before specimen collection. Sent immediately to the lab in ice.	Chemical Pathology
17	Amylase, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
18	Amylase, Fluid	Body Fluid	Sterile container	3.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
19	Amylase, Urine	Random urine (preferable 1st morning urine) / 24 hrs urine	Sterile container / 24 hrs urine container	Random urine :5.0 mL 24 hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
20	Anti-HBs (ELISA)	Blood	Gel tube	3.0-5.0 mL	once a month	Non-urgent : 1 month Urgent :24 hrs	-	Microbiology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
21	Anti-HCV (EUSA)	Blood	Gel tube	3.0-5.0 mL	Two days a week	5 days	-	Microbiology
22	Anti-HCV (Rapid Test)	Blood	Gel tube	2.0 mL	Daily for NSI case	24 hours	-	Microbiology
23	Antistreptolysin O titre (ASOT)	Blood	Gel tube	3.0-5.0 mL	Two times a week	3 days	-	Microbiology
24	Aspartate Transaminase (AST)	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
25	Beta Human Chorionic Gonadotropin (β -hCG)	Blood	Gel tube	3.0 mL	24 hours	Urgent: 24 hrs Routine: 5 working days	-	Chemical Pathology
26	Bilirubin, Direct	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Avoid specimen from light source.	Chemical Pathology
27	Bilirubin, Indirect	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Calculated value. Indirect Bilirubin = Total Bilirubin-Direct Bilirubin	Chemical Pathology
28	Biological Indicator Test (Attest)	Attest tube that has been autoclaved together with sterile	NA	NA	Daily	2 days	This test is to confirm sterility of autoclave session.	Microbiology

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
29	Blood Culture & Sensitivity (Aerobic)	Aerobic blood culture bottle	Adult :10.0 mL Paeds : 3.0 mL	Daily	5 days for negative culture, 3 days for positive culture		Microbiology
30	Blood Culture & Sensitivity (Anaerobic)	Anaerobic blood culture bottle	Adult :10.0 mL Paeds : 3.0 mL	Daily	5 days for negative culture, 3 days for positive culture	Request blood culture bottle in Micro Lab	Microbiology
31	Blood Film for Malaria Parasites (BFMP)	Thick and thin blood smear	Thick : 2 drops, spread circularly. Thin : 1 drop, spread forward using spreader.	24 hours	2 hours		Microbiology
32	Blood film Microfilaria	Slide (thick blood film)		Daily	24 hours		Microbiology
33	Blood for Fungal Culture	Fungal/MTB blood culture bottle	1.0-5.0 mL	Daily	14 days	Request blood culture bottle in Micro Lab	Microbiology
34	Blood for MTB Culture	Fungal/MTB blood culture bottle	1.0-5.0 mL	Daily	42 days	Request blood culture bottle in Micro Lab	Microbiology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
35	Blood Gas	Arterial / Venous Blood	Heparinized Syringe	1.0 mL	24 hours	90 mins	Sent immediately to the lab in ice. Please avoid air bubbles and attach rubber stopper to the syringe before sending the specimen to the laboratory.	Chemical Pathology
36	Blood Urea Serum Electrolytes (BUSE)	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Profile Test : Sodium, Potassium, Urea	Chemical Pathology
37	Body fluid Culture & Sensitivity (except CSF, urine,	Broncho alveolar lavage, synovial,	Sterile container	5.0 mL	Daily	3 - 5 days		Microbiology
38	Bone Culture & Sensitivity	Bone	Sterile container	NA	Daily	3 - 5 days		Microbiology
39	Bone Marrow Aspirate	Bone Marrow	Bone marrow smear	NA	By appointment	7 days	Request must be accompanied with FBP	Hematology
40	Bone Marrow Trepphine	Bone Marrow	Sterile/ universal container (with 10% formalin)	NA	By appointment	14 days	-	Hematology
41	C-Reactive Protein (CRP)	Blood	Gel tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
42	Calcium (Corrected)	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Corrected calcium is calculated if serum albumin <40g/L or >45g/L Calculated value.	Chemical Pathology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
43	Calcium, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
44	Calcium, Urine	Random urine (preferable 1st morning urine)/24-hrs urine	Sterile container/ 24hrs urine container	Random :5.0 mL 24hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
45	Cardiac Enzyme (CE)	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Profile Test : Creatinine Kinase, Lactate Dehydrogenase & AST	Chemical Pathology
46	Cerebrospinal fluid (CSF) Culture & Sensitivity	CSF	Sterile bijou bottle	2.0-3.0 mL	Daily	3 - 5 days	-	Microbiology
47	Cerebrospinal fluid (CSF) FEME	CSF	Sterile bijou bottle	2.0-3.0 mL	Daily	24 hours	-	Microbiology
48	Chikungunya IgG/ IgM	Blood	Gel tube	3.0-5.0 mL	Every working day	24 hours	-	Microbiology
49	Chloride, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of RP	Chemical Pathology
50	Chloride, CSF	CSF	Sterile bijou bottle	1.0-2.0 mL	24 hours	90 mins	Send immediately to the lab to the lab.	Chemical Pathology

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
51	Chloride, Urine	Random urine (preferable 1st morning urine)/24 hrs urine	Sterile container/ 24hrs urine container	Random :5.0 mL 24hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection. Chemical Pathology
52	Cholesterol Total, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	4 hrs	- Chemical Pathology
53	Cholesterol Total, Fluid	Body Fluid	Sterile container	3.0 mL	24 hours	4 hrs	- Chemical Pathology
54	Cholesterol, non HDL	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	4 hrs	Calculated value; test is part of Fasting Lipid Profile (FLP). Chemical Pathology
55	Coomb's Test (Direct / Indirect)	Blood	EDTA tube	Adult : 5.0 mL. Infant : 0.5 mL	Office hour	1 working day	PER-PAT 301 Please contact MO Pathology Oncall for patient require urgent Coomb's test outside office hour Transfusion
56	Corneal Scraping for KOH Stain	Corneal scraping	Sterile container	NA	Every working day	24 hours	- Microbiology
57	Covid-19 Rapid Antigen Test	Nasopharyngea l swab	Dacron swab in sterile container	NA	Daily	90 mins	- Microbiology
58	Creatinine Kinase (CK)	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	- Chemical Pathology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
59	Creatinine Clearance	1. Blood 2. 24 hrs urine	1. Heparin tube 2. 24hrs Urine Container	1. Blood : 4.0 mL 2. 24hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
60	Creatinine, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of RP	Chemical Pathology
61	Creatinine, Fluid	Body Fluid	Sterile container	3.0 mL	24 hours	4 hrs	-	Chemical Pathology
62	Creatinine, Urine	1st morning urine/ 24 hrs urine	Sterile container/ 24hrs urine container	Random: 5.0 mL 24hrs : as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
63	Cryptococcal antigen, CSF	CSF	Sterile bijou bottle	3.0 mL	Every working day	24 hours	-	Microbiology
64	Cryptococcal antigen, Serum	Blood	Gel tube	5.0 mL	Every working day	24 hours	-	Microbiology
65	D-Dimer (Quantitative)	Blood	Sodium Citrate tube	1 tube Paed: 1.0 mL Adult: 1.8 mL	24 hours	2 hours	Adequately filled to the level indicated on tube, thoroughly mix by inverting gently 3-4 times and Send immediately to the lab to the laboratory.	Hematology
66	Dengue IgG/IgM Rapid Test	Blood	Gel tube	3.0-5.0 mL	Daily	24 hours		Microbiology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
67	Dengue NS1 Rapid Test	Blood	Gel tube	3.0-5.0 mL	Daily	24 hours	-	Microbiology
68	Ear Swab Culture & Sensitivity	Pus	Amies transport media	NA	Daily	2 - 4 days	-	Microbiology
69	Environmental Sampling Culture	Environmental swab	Amies transport media	NA	Daily	4 days	-	Microbiology
70	Erythrocyte Sedimentation Rate (ESR)	Blood	ESR tube glass long type	Adequately filled to the level indicated on tube	24 hours	2 hours	Thoroughly mix by inverting gently 8-10 times and Send immediately to the lab to the laboratory.	Hematology
71	Estimated Glomerular Filtration Rate	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	EGFR is automatically calculated based on 2009 CKD-EPI equation Calculated value; test is part of Renal Profile (RP).	Chemical Pathology
72	Eye Swab Culture & Sensitivity	Swab form eye/ eye discharge	Amies transport media	NA	Daily	3 - 5 days	-	Microbiology
73	Faecal Occult Blood (FOB)	Stool	Sterile container	3.0 mL or peanut size	Every working day	1 working day	-	Chemical Pathology
74	Ferritin	Blood	Gel tube	Adult: 4.0 mL Paeds: 0.5 mL	Once a week	3 working days	-	Chemical Pathology

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
75	Fibrinogen	Sodium Citrate tube	1 tube Paed: 1.0 mL Adult: 1.8 mL	24 hours	24 hours	Adequately filled to the level indicated on tube, thoroughly mix by inverting gently 3-4 times and Send immediately to the lab to the laboratory.	Hematology
76	Free Thyroxin (FT4)	Gel tube	Adult: 4.0 mL Paeds: 0.5 mL	Every working day	Urgent: 24 hours Routine : 3 working days	-	Chemical Pathology
77	Full Blood Count (FBC)	EDTA tube	1 tube Paeds: 0.5 mL Adult: 2.0 mL	24 hours	Urgent :45 mins Routine: 2 hours	Thoroughly mix by inverting gently 8-10 times.	Hematology
78	Full Blood Picture (FBP)	EDTA tube	1 tube Paeds: 0.5 mL Adult: 2.0 mL	24 hours	Urgent :24 hours Routine: 4 days	Thoroughly mix by inverting gently 8-10 times and Send immediately to the lab to the laboratory. Please call Pathology MO / Specialist for urgent request.	Hematology
79	Fungal Culture	Sterile container	2 mm cube or fluid : 2.0-3.0 mL	Daily	2 - 3 weeks	For corneal scraping, collect plate from Micro Lab.	Microbiology
80	Genital Swab Culture & Sensitivity (HVS, Endocervical, Urethra, etc)	Amies transport media, Charcoal Transport Media (For GC only)	NA	Daily	2 - days	-	Microbiology

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
81	Blood	Plain tube (Red cap)	3.0 mL	24 hours	Urgent: 90 mins Routine: 24 hrs	Please use TDM request form. Call pharmacist ext: 3310 (office hour) /3255 (on call) before sent	Chemical Pathology
82	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Globulin = Serum total protein - Serum Albumin	Chemical Pathology
83	Cord blood	Filter Paper blood spot	60 uL (One drop of cord blood on the filter paper)	Daily (performed by batch everyday)	24 hours	-	Hematology
84	Blood	Fluoride Oxalate Tube	Adult : 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
85	CSF	Fluoride Oxalate Tube	1.0 - 2.0 mL	24 hours	90 mins	Send immediately to the lab	Chemical Pathology
86	Random urine (preferable 1st morning urine)/ 24 hrs urine	Sterile container/ 24hrs urine container	Random :5.0 mL 24hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
87	Blood	EDTA tube	Adult : 5.0 mL. Infant : 1.0 mL. specimen from infant less than 4 month must be accompanied with mother's blood (5.0 mL)	24 hours	2 hours	PPDKS-Pin 1/2009 form is required. For infant, if maternal blood is unavailable, 3mL of infant blood in EDTA is required for testing	Transfusion

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
88	Group and Crossmatch- Saline Phase	Blood	EDTA tube	Adult : 5.0 mL. Infant : 1.0 mL. specimen from infant less than 4 month must be accompanied with mother's blood (5.0 mL)	24 hours	30 mins	PPDK5-Pin 1/2009 form is required. For infant, if maternal blood is unavailable, 3mL of infant blood in EDTA is required for testing	Transfusion
89	Group Screen and Hold (GSH)	Blood	EDTA tube	Adult : 5.0 mL. Infant : 1.0 mL. specimen from infant less than 4 month must be accompanied with mother's blood (5.0 mL)	24 hours	2 hours	PPDK5-Pin 1/2009 form is required. For infant, if maternal blood is unavailable, 3mL of infant blood in EDTA is required for testing	Transfusion
90	GSH to GXM conversion	-	-	-	24 hours	2 hours	-	Transfusion
91	Haemoglobin Analysis	Blood	EDTA tube	1 tube Paeds: 0.5 mL Adult: 2.0 mL	Daily	6 weeks	-	Hematology
92	HBs Antigen (ELISA)	Blood	Gel tube	3.0-5.0 mL	Two days a week	5 days	-	Microbiology
93	HBs Antigen (Rapid Test)	Blood	Gel tube	2.0 mL	Daily for NSI case	24 hours	-	Microbiology
94	Hemoglobin A1c (HbA1c)	Blood	EDTA tube	3.0 mL	Twice a week	5 working days	Rejection criteria : 1. Request less than 3 months from previous result if A1c =or>7.0% 2. Request less than 6 months from previous result if A1c <7.0%	Chemical Pathology

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
95	High Density Lipoprotein (HDL)-Cholesterol	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	4 hrs	-	Chemical Pathology
96	HIV Serology (ELISA)	Gel tube	3.0-5.0 mL	Two times a week	4 days	-	Microbiology
97	HIV Serology (Rapid Test)	Gel tube	2.0 mL	Daily for NSI case	24 hours	-	Microbiology
98	India ink for Cryptococcus	Sterile bijou bottle	2.0-3.0 mL	Daily	24 hours	-	Microbiology
99	Investigation of Transfusion Reaction	<ol style="list-style-type: none"> EDTA tube Sterile container Use stopper to avoid leaking from the tip of blood administration set and put in biohazard plastic bag 	<ol style="list-style-type: none"> Adult : 10.0 mL Infant : 1.0 mL Adult : 10.0 mL Infant : 5.0 mL All of remaining volume in the blood bag 	Office hour	10 working days	<p>To collect these forms from Transfusion Lab:</p> <ol style="list-style-type: none"> Request form for Transfusion Reaction Investigation (Blood and Blood Components) BTS/TR/2/2016 Reporting Form for Transfusion-Related Adverse Event Transfusion Medicine Service Kementerian Kesihatan Malaysia BTS/HV/3/2016 <p>*Other test might be needed depend on type of transfusion reaction & suggestion by medical officer in charge of transfusion lab.</p>	Transfusion

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
100	Iron	Blood	Gel tube	3.0 mL	Once a week	3 working days	Test is part of Iron Profile/Study	Chemical Pathology
101	Iron Profile/Study	Blood	Gel tube	3.0 mL	Once a week	3 working days	Profile test : Iron, Transferrin, Transferrin Saturation	Chemical Pathology
102	Kleihauer test	Blood	EDTA tube	1 tube Paeds: 0.5 mL Adult: 2.0 mL	By appointment	2 days	Send immediately to the lab to the laboratory.	Hematology
103	Lactate Dehydrogenase (LDH), Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
104	Lactate Dehydrogenase (LDH), Fluid	Body Fluid	Sterile container	1.0 - 2.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
105	Lactate, Blood	Blood	Fluoride Oxalate Tube	Adult : 4.0 mL Paeds: 0.5 mL	24 hours	90 mins	Sent immediately to the lab in ice.	Chemical Pathology
106	Lactate, CSF	CSF	Fluoride Oxalate Tube	1.0 - 2.0 mL	24 hours	90 mins	Sent immediately to the lab in ice.	Chemical Pathology
107	Leptospira IgM	Blood	Gel tube	3.0-5.0 mL	Every working day	24 hours		Microbiology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
108	Lipid Profile	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Profile Test : Cholesterol (Total), HDL, Triglyceride, LDL & non-HDL	Chemical Pathology
109	Liver Function Test (LFT)	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Profile Test : ALT, ALP & Albumin	Chemical Pathology
110	Low Density Lipoprotein (LDL)-Cholesterol	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	4 hrs	Calculated value; test is part of Fasting Lipid Profile (FLP).	Chemical Pathology
111	Magnesium, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
112	Magnesium, Urine	Random urine (preferable 1st morning urine)/ 24 hrs urine	Sterile container/24hrs urine container	Random :5.0 mL 24hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
113	Manual differential count for body fluid (eg: PD fluid)	Body fluid	Sterile/ universal container	3.0 mL	By appointment	2 days	Send immediately to the lab to the laboratory.	Hematology

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
114	Mixing test	Blood	Sodium Citrate 2 tubes Paed: 1.0 mL Adult: 1.8 mL	By appointment	2 days	Adequately filled to the level indicated on tube, thoroughly mix by inverting gently 3-4 times and Send immediately to the lab to the laboratory	Hematology
115	MRSA screening	Swab from nasal, arm pit, or thigh.	Amies transport media	NA	Daily 2 - 4 days	-	Microbiology
116	MTB/RIF Gene Xpert Ultra	Sputum, tissue, CSF, etc	Sterile container	2.0 - 3.0 mL	Daily 24 hours	-	Microbiology
117	Nasopharyngeal swab/ Aspirate Culture & Sensitivity	Nasopharyngeal swab/aspirate	Amies transport media, sterile container	NA	Daily 3 - 5 days	-	Microbiology
118	Paraquat	Urine	Sterile container	20.0 mL	24 hours 90 mins	Send immediately to the lab	Chemical Pathology
119	Peritoneal Equilibrium Test (PET)	Peritoneal Dialysate fluid	Sterile container	3.0 mL	24 hours Urgent: 90 mins Routine: 4 hrs	This test include Urea, Glucose, Creatinine, Total Protein	Chemical Pathology
120	Phosphate Inorganic, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
121	Phosphate Inorganic, Urine	1st morning urine/ 24 hrs urine	Sterile container/ 24hrs urine container	Random: 5.0 mL 24hrs : as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
122	Potassium, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of RP	Chemical Pathology
123	Potassium, Urine	1st morning urine/ 24 hrs urine	Sterile container/ 24hrs urine container	Random: 5.0 mL 24hrs : as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
124	Protein Total, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
125	Protein Total, CSF	CSF	Sterile bijou bottle	1.0 - 2.0 mL	24 hours	90 mins	Send immediately to the lab	Chemical Pathology
126	Protein Total, Fluid	Body Fluid	Sterile container	3.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
127	Protein Total, Urine	1st morning urine/ 24 hrs urine	Sterile container/ 24hrs urine container	Random:5 mL 24hrs : as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
128	Prothrombin time (PT) and International Normalised Ratio (INR)	Blood	Sodium Citrate	1 tube Paed: 1.0 mL Adult: 1.8 mL	24 hours	Urgent :1 hour Routine: 2 hours	Adequately filled to the level indicated on tube, thoroughly mix by inverting gently 3-4 times and Send immediately to the lab to the laboratory.	Hematology
129	Pus Aspirate Culture & Sensitivity	Pus or pus aspirate	Sterile container	3.0 - 5.0 mL	Daily	3 - 5 days	-	Microbiology
130	Qiasat Respiratory Panel	Nasopharyngeal swab	Universal transport medium (UTM)	NA	Daily	4 hours	Collect UTM from Micro Lab	Microbiology
131	Rapid Plasma Reagin (RPR)	Blood	Gel tube	3.0-5.0 mL	Two days a week	3 days	-	Microbiology
132	RBC Antibody Identification	Blood	EDTA tube	Adult : 10.0 mL Infant : 1.0 mL specimen from infant less than 4 month must be accompanied with mother's blood (10.0 mL)	24 hours	5 working days	PER-PAT 301 form is required. Referral to National Blood Centre for further test is required in certain complex case. For infant, if maternal blood is unavailable, 3mL of infant blood in EDTA is required for testing	Transfusion
133	RBC Antibody Screening	Blood	EDTA tube	Adult : 5.0 mL Infant : 1.0 mL specimen from infant less than 4 month must be accompanied with mother's blood (5.0 mL)	24 hours	2 hours	PER-PAT 301 form is required. For infant, if maternal blood is unavailable, 3mL of infant blood in EDTA is required for testing	Transfusion

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
134	RBC phenotyping	Blood	EDTA tube	3.0 mL	Office hour	5 working days	PER-PAT 301	Transfusion
135	Rectal Screening for CRE	Rectal Swab	Cary Blair	NA	Daily	3 days	For screening of contacts or CRE positive cases only	Microbiology
136	Renal Profile (RP)	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Profile Test : Sodium, Potassium, Urea & Creatinine	Chemical Pathology
137	Respiratory Virus Antigen (Influenza A/B/RSV/Adeno)	Nasopharyngeal swab, aspirate	Dacron swab in sterile container,	NA	Every working day	24 hours	-	Microbiology
138	Reticulocyte count	Blood	EDTA tube	1 tube Paeds: 0.5 mL Adult: 2.0 mL	24 hours	2 hours	Thoroughly mix by inverting gently 8-10 times and Send immediately to the lab to the laboratory.	Hematology
139	Rheumatoid Factor (RF)	Blood	Gel tube	3.0 mL	Once a week	5 working days	-	Chemical Pathology
140	Salicylate	Blood	Plain tube (Red cap)	3.0 mL	24 hours	90 mins	Please use TDM request form. Call pharmacist ext: 3310 (office hour) /3255 (on call) before sent specimen.	Chemical Pathology
141	Seminal Fluid Analysis	Semen	Sterile container	As much as possible	Every working day except Thursday	24 hours	-	Microbiology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNITY/ LOCATION
142	Serum Ascites Albumin Gradient (SAAG)	1. Blood 2. Peritoneal Fluid	1. Heparin tube 2. Sterile Container	1. Blood : 3.0 mL 2. Fluid : 5.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
143	Silt Skin Smear for Leprosy	Skin silt smears from both earlobes, elbows, and	Slide		Every working day	7 days	-	Microbiology
144	Sodium, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of RP	Chemical Pathology
145	Sodium, Urine	1st morning urine/24 hrs urine	Sterile container/24hrs urine container	Random :5.0 mL 24hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
146	Sputum Culture & Sensitivity	Sputum	Sterile container	NA	Daily	3 - 5 days	-	Microbiology
147	Sterility Test	Specimen from Pharmacy	Sterile container	NA	Daily	4 days	-	Microbiology
148	Stool Culture & Sensitivity	Feces, rectal swab	Sterile container, Cary Blair Transport Media	About 1 gram or 5.0 mL for watery diarrhoea	Daily	3 - 5 days	-	Microbiology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
149	Stool for Clostridium Difficile Toxin	Stool	Sterile container	3.0 mL	Every working day	24 hours	-	Microbiology
150	Stool for Ova & Cyst	Stool	Sterile container	3.0 mL	Every working day	24 hours	-	Microbiology
151	Stool for Rotavirus	Fresh Stool	Sterile container	3.0 mL	Every working day	24 hours	-	Microbiology
152	Throat for diphtheria Culture & Sensitivity	Swab from throat area/tonsil/pseudomembrane	Amies transport media	NA	Daily	3 - 5 days	-	Microbiology
153	Throat swab Culture & Sensitivity	Swab from throat area/tonsil	Amies transport media	NA	Daily	2 - 4 days	-	Microbiology
154	Thyroid Function Test (TFT)	Blood	Gel tube	3.0 mL	Every working day	Urgent : 24 hrs Routine: 3 working days	TSH is a first line screening. Free T4 is added if indicated.	Chemical Pathology
155	Thyroid Stimulating Hormone (TSH), Blood	Blood	Gel tube	3.0 mL	Every working day	STAT : 24 hours Routine: 3 working days	-	Chemical Pathology
156	Thyroid Stimulating Hormone (TSH), Cord Blood	Cord Blood	Gel tube	3.0 mL	Daily	48 hrs	-	Chemical Pathology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
157	Tissue Culture & Sensitivity	Tissue	Sterile container		Daily	3 - 5 days	-	Microbiology
158	Tracheal aspirate Culture & Sensitivity	Tracheal aspirate	Sterile container	3.0 - 4.0 mL	Daily	3 - 5 days	-	Microbiology
159	Transferrin	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	3 working days	-	Chemical Pathology
160	Transferrin Saturation	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	3 working days	Calculated value; test is part of Iron profile. TSAT = Iron(umol/L)/Transferrin (g/L) x3.982	Chemical Pathology
161	Treponema pallidum particle agglutination test (TPPA)	Blood	Gel tube	3.0-5.0 mL	twice a week	3 days		Microbiology
162	Triglycerides, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	4 hrs	-	Chemical Pathology
163	Triglycerides, Fluid	Body Fluid	Sterile container	3.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
164	Urea, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	Test is part of RP	Chemical Pathology

	TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
165	Urea, Fluid	Body Fluid	Sterile container	3.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
166	Urea, Urine	Random urine (preferable 1st morning urine)/24 hrs	Sterile container/24hrs urine container	Random :5.0 mL 24hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
167	Uric Acid, Blood	Blood	Heparin tube	Adult: 4.0 mL Paeds: 0.5 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
168	Uric Acid, Urine	1st morning urine/24 hrs urine	Sterile container/24hrs urine container	Random :5.0 mL 24hrs urine: as per collection	Once a week	5 working days	Please stated the urine volume in a request form for 24hrs urine collection.	Chemical Pathology
169	Urinalysis biochemistry	Random mid stream urine	Sterile container	5.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
170	Urine Calcium Creatinine Ratio/ Index (UCCR/UCCA)	Random urine (preferable 1st morning urine)	Sterile container	5.0 mL	Once a week	5 working days	-	Chemical Pathology
171	Urine Culture & Sensitivity	Suprapubic aspirate, mid stream urine, catheter urine	Sterile container with Boric Acid	15.0 - 20.0 mL	Daily	3 - 5 days	-	Microbiology

TEST	TYPE OF SPECIMEN	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
172	Urine Pregnancy Test (UPT)	Sterile container	3.0 mL	24 hours	Urgent: 90 mins Routine: 4 hrs	-	Chemical Pathology
173	Urine Protein Creatinine Ratio/ Index (UPCR/UPCI)	Sterile container	5.0 mL	Once a week	5 working days	-	Chemical Pathology
174	Vancomycin	Plain tube (Red cap)	3.0 mL	24 hours	Urgent: 90 mins Routine: 24 hrs	Please use TDM request form. Call pharmacist ext: 3310 (office hour) /3255 (on call) before sent	Chemical Pathology
175	Weak - D test/ Du test	EDTA tube	5.0 mL	24 hours	2 hours	PER-PAT 301	Transfusion
	TYPE OF BLOOD PRODUCT	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	TAT	COMMENT	UNIT/ LOCATION
1	Cryosupernatant	EDTA tube	Adult : 5 ml. Sample from infant less than 4	By appointment	5 working days	Cryosupernatant not routinely prepared. Clinician need to book prior to usage	Transfusion
2	Fresh Frozen Plasma (FFP)/ Cryoprecipitate	EDTA tube	Adult : 5 ml. Sample from infant less than 4	24 hours	45 minutes	PPDK5-Pin 1/2009 form is required. For infant, if maternal blood is unavailable, 3ml of infant blood in EDTA is required	Transfusion
3	Platelet	EDTA tube	Adult : 5 ml. Sample from infant less than 4	24 hours	45 minutes	Depends on the availability of the platelet. For infant, if maternal blood is unavailable, 3ml of infant blood in EDTA	Transfusion
4	Whole Blood / Pack Cell	EDTA tube	Adult : 5 ml. Sample from infant less than 4	24 hours	2 hours	Request must be preceded by GSH / GXM test .	Transfusion

LIST OF TESTS (REFERRAL)

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
1	17 Hydroxy Progesterone (17-OH)	Blood	3.5 mL	1 month	PER-PAT 301	-	Chemical Pathology	Hospital Putrajaya (HPJ)
2	5-Hydroxy-Indol-Acetic Acid (5-HIAA)	24 hrs urine container with 10.0 mL of 25% hydrochloric acid (HCL)	as per collected	20 days	IMR-IEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
3	A Disintegrin And Metalloproteinase with Thrombospondin	Blood	2.0 mL (2 tubes)	6 weeks	Hospital Ampang Special Haematology Requisition Form; Hem-RQ19.Ver4.31 Aug 2021	-	Hematology	Hospital Ampang
4	Acanthamoeba sp/Naegleria sp microscopy	Corneal scrape, Contact lens, Contact lens suspension, Spinal fluid	NA	2 - 3 weeks	PER-PAT 301	-	Microbiology	Parasitology Unit, IMR NIH Setia Alam
5	Acanthamoeba spp PCR	Corneal scrape, Contact lens, Contact lens suspension, Spinal fluid	NA	2 - 3 weeks	PER-PAT 301	-	Microbiology	Parasitology Unit, IMR NIH Setia Alam
6	Acid α -Glucosidase enzyme (POMPE)	Dried blood spot (DBS)	3 circles of DBS	20 days	IMR-IEM REQUEST FORM Version 6	Ensure blood completely dried before putting in plastic sheet. Wet and insufficient blood spot will be rejected.	Chemical Pathology	Biochemistry Unit, IMR KL
7	Acute Myeloid Leukemia Mutation Analysis	Bone Marrow	2.0 mL (2 tubes)	1 month	Molecular Analysis for Leukemia, IMR) Hemato-oncology Request Form Version 3.0	-	Hematology	Haematology IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
8	Adenosine Deaminase (ADA)	Pleural Fluid	Plain tube (Red Cap)	4.0 mL	7 working days	BORANG PERMOHONAN UJIAN MAKMAL (SPESIMEN KLINIKAL) /MKAK MKAK-BPU-U01/ Rev2018	Suggest to send the sample on Monday. Referral lab run by batch only on Thursday. MANDATORY authorization by Specialist is required & stated the requestor phone number.	Chemical Pathology	MKAK Sg. Buloh
9	Adenovirus F41 qRT - PCR	Blood, Liver Biopsy, Tissue	EDTA, Sterile container with VTM or Normal Saline	1.0 - 3.0 mL EDTA, 1.5cm Liver	1 month	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	By consultation only, Please call IMR at 03-33628960.	Microbiology	Virology Unit, IMR, NIH Setia Alam
10	Adenovirus qRT - PCR	i) Nasopharyngeal aspiration, ii) Nasopharyngeal swab, iii) Throat swab, iv) Throat gargle, v) BAL, vi) Sputum, vii) Nasal swab, viii) Organ biopsies	i) NPA: Sterile plastic vial contain 2.0 - 3.0 mL of VTM , ii) NPS / TS / NS : A flexible, swab in plastic vial contain 2.0 - 3.0 mL of VTM iii) Throat gargle / BAL / Sputum / Nasal swab : Sterile container iv) Biopsy: Sterile container's containing VTM	i) NPA: AS much as possible ii) Biopsy: remove portions, about 1.5cm cube of various parts of affected organs moist iii) Others : Not applicable	1 month	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT I NCHARGE	OUTSOURCED TO
11	Adrenocorticotrophic Hormone (ACTH)	Blood	EDTA tube	2.0 mL	2 weeks	PER-PAT 301	(EDTA tube) Pre-chilled the tube before taking the blood	Chemical Pathology	Hospital Kuala Lumpur (HKL)
12	Alcohol (Ethanol), blood	Blood	Sodium Fluoride tube	2.0 mL (5 tubes)	6 months	Borang Permohonan Bagi Pemeriksaan Forensik/Toksikologi (Kimia 15-Pin.1/2004)	-	Chemical Pathology	Jabatan Kimia Pulau Pinang
13	Alcohol (Ethanol), urine	Urine	Sterile container	25.0 mL	6 months	Borang Permohonan Bagi Pemeriksaan Forensik/Toksikologi (Kimia 15-Pin.1/2004)	-	Chemical Pathology	Jabatan Kimia Pulau Pinang
14	Aldosterone/Renin (ARR)	Blood	EDTA tube	2.0 mL (2 tubes)	1 month	PER-PAT 301	Sent immediately to the lab without ice within 30 mins form the blood is withdrawn.	Chemical Pathology	Hospital Putrajaya (HPJ)
15	Alpha Fetoprotein (AFP)	Blood	Gel tube	3.5 mL	7 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg. Petani.
16	Alpha-1-Antitrypsin (Phenotyping), serum	Blood	Gel tube	3.5 mL	1 month	IMR-SPECIAL PROTEIN REQUEST FORM Version 9.4	Send immediately to the lab after sample collection.	Chemical Pathology	Special Protein Unit, IMR KL
17	Alpha-1-Antitrypsin (Quantitation), serum	Blood	Gel tube	3.5 mL	2 weeks	PER-PAT 301	Send immediately to the lab after sample collection	Chemical Pathology	Hospital Kuala Lumpur (HKL)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
18	Amikacin	Blood	Plain tube (Red Cap)	3.5 mL	2 working days	TDM REQUEST FORM	Inpatient/Urgent case: Samples should be sent to the laboratory 90 mins	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
19	Amino Acid, CSF	1. CSF 2. Blood	1. Sterile container 2. Heparin Tube	1. CSF : 1.0 mL 2. Blood : 4.0 mL	20 days	IMR-LEM REQUEST FORM Version 6	CSF must be accompanied by patient's blood.	Chemical Pathology	Biochemistry Unit, IMR KL
20	Amino Acids, Plasma	Blood	Heparin tube	3.5 mL	1 month	IMR-LEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
21	Amino Acids, Urine	Random Urine	Sterile container	3.0 mL	20 working days	IMR-LEM REQUEST FORM Version 6	Active by Consultation Only MANDATORY	Chemical Pathology	Biochemistry Unit, IMR KL
22	Amoebiasis PCR (Temporary discontinue)	Blood, pus aspirate, biopsy, scraping	EDTA, sterile container	2.5 mL	1 month	PER-PAT 301	-	Microbiology	Parasitology Unit, IMR NIH Setia Alam
23	Amoebiasis Serology	Blood	Gel tube/EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	ELISA/ Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
24	Anti Acetylcholine Receptor Antibody (ACHR)	Blood	Gel tube	3.5 mL	3 weeks	IMR Autoimmune Request Form	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
25	Anti Aquaporin 4 (Anti AQP4)	Blood/CSF	Gel tube, Bijou bottle	3.5 mL	2 weeks	IMR Autoimmune Request Form (IMR/AIRC/Autoimmune/RF)	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
26	Anti Beta 2 glycoprotein (Anti-β2GP1)	Blood	Gel tube	3.5 mL	2 - 3 weeks	PER-PAT 301	-	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
27	Anti Cardiolipin Antibody (ACL)	Blood	Gel tube	3.5 mL	2 - 3 weeks	PER-PAT 301	-	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
28	Anti Cyclic Citrullinated Peptide (Anti CCP)	Blood	Gel tube	3.5 mL	2 - 3 weeks	PER-PAT 301	-	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
29	Anti Gastric Parietal Cell Antibody (APC)	Blood	Gel tube	3.5 mL	2 - 3 weeks	PER-PAT 301	-	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
30	Anti Glomerular Basement Membrane (GBM)	Blood	Gel tube	3.5 mL	2 weeks	IMR Autoimmune Request Form	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
31	Anti Islet Cells (ICA)	Blood	Plain tube (Red Cap)	Adult : 4.0 mL Paed : 1.0 mL	20 working days	IMR-ENDOCRINE REQUEST FORM	Send immediately to the lab after specimen collection (stability : 2-8°C (3 days) -20°C (up to 6 months)	Chemical Pathology	Endocrine Unit IMR, KL
32	Anti Mullerian Hormone (AMH)	Blood	Plain tube (Red Cap)	Adult: 4.0 mL Paeds: 1.0 mL	20 working days	IMR-ENDOCRINE REQUEST FORM	Send immediately to the lab after specimen collection (stability : 2-8°C (3 days) -20°C (up to 6 months)	Chemical Pathology	Endocrine Unit IMR, KL

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
33	Anti N-Methyl-D-Aspartate Receptor	Blood/CSF	Gel tube/Bijou bottle	3.5 mL	2 weeks	IMR Autoimmune Request Form	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
34	Anti Neutrophil Cytoplasmic Antibody (ANCA)	Blood	Gel tube	3.5 mL	2 - 3 weeks	PER-PAT 301	-	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
35	Anti nuclear antibody (ANA)	Blood	Gel tube	3.5 mL	1 – 2 weeks	PER-PAT 301	-	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
36	Anti Xa	Blood	Sodium Citrate tube	2.0 mL (2 tubes)	1 week	Hospital Ampang Special Haematology Requisition Form; Hem-RQ19.Ver4.31 Aug	Please contact Hemostasis Lab Hospital Ampang for appointment	Hematology	Hospital Ampang
37	Anti-D titre	Blood	EDTA tube	10.0 mL	21 days	PER-PAT 301	Specimen need to be sent to transfusion laboratory before 12 noon	Transfusion	Pusat Darah Negara (PDN)
38	Anti-double stranded DNA (ds DNA)	Blood	Gel tube	3.5 mL	2 - 3 weeks	PER-PAT 301	Further test of ANA (CTD) or if clinically indicated	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
39	Anti-fungal susceptibility testing	Pure clinical yeast isolate. Mixed growth will be rejected	Pure clinical yeast isolate in media that support growth	NA	2 weeks	Mycology Request Form (IMR/IDRC/BACT/ MYCO/01)	Identify the yeast first and send result together with pure isolate and clinical history. Transport condition: ambient temperature. Attach any preliminary test results.	Microbiology	Bacteriology Unit, IMR NIH Setia Alam

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
40 Anti-Glutamic Acid Decarboxylase (GAD 65)	Blood	Plain tube (Red Cap)	Adult: 4.0 mL Paeds: 1.0 mL	20 working days	IMR-ENDOCRINE REQUEST FORM	Send immediately to the lab after specimen collection (stability : 2-8°C (3 days) -20°C (up to 6 months)	Chemical Pathology	Endocrine Unit IMR, KL
41 Anti-Insulinoma – Associated Antigen-2 (IA2)	Blood	Plain tube (Red Cap)	Adult: 4.0 mL Paeds: 1.0 mL	20 working days	IMR-ENDOCRINE REQUEST FORM	Send immediately to the lab after specimen collection (stability : 2-8°C (3 days) -20°C (up to 6 months)	Chemical Pathology	Endocrine Unit IMR, KL
42 Anti-neutrophil cytoplasmic antibody (Anca) Panel -Anti-myeloperoxidase	Blood	Gel tube	3.5 mL	3-4 weeks	PER-PAT 301	Further test of ANCA or if clinically indicated	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
43 Anti-platelet Factor 4	Blood	Gel tube	3.5 mL (3 tubes)	8 weeks	Hospital Ampang Special Haematology Requisition Form; Hem-RQ19_Ver4.31 Aug 2021	Please contact Hemostasis Lab Hospital Ampang for appointment	Hematology	Hospital Ampang
44 Anti-Thyroglobulin Antibody	Blood	Gel tube	3.5 mL	2 weeks	PER-PAT 301	Please provide relevant clinical history & latest TFT result.	Chemical Pathology	Hospital Pulau Pinang (HPP)
45 Anti-Thyroid (TSH) Receptor Antibody	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	Please provide relevant clinical history and latest TFT result MANDATORY authorization by Specialist is required.	Chemical Pathology	Hospital Kuala Lumpur (HKL)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
46	Anti-Thyroid Peroxidase (anti-TPO) / Anti-Thyroid	Blood	Gel tube	3.5 mL	2 weeks	PER-PAT 301	Please provide relevant clinical history & latest TFT result.	Chemical Pathology	Hospital Pulau Pinang (HPP)
47	Argininosuccinic Acid	Random Urine	Sterile container	2.0 mL	10 working days	IMR-IEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
48	Aspergillus galactomanan antigen detection	Blood, BAL	Gel tube, sterile container	as much as possible	3 working days	PER-PAT 301	CLIA, transportation : 2-8 celcius, Specialist signature	Microbiology	Microbiology Unit, HSJ
49	Atypical Mycobacterium infection or Mycobacteria other than Tuberculosis (MOTT) PCR	Sputum, stool, tissue, FFPE block, pus, CSF & other body fluids	Sterile container	For CSF 1.0 - 2.0 mLs	2 weeks	Tuberculosis Laboratory Request Form(IMR/IDRC/BACT/TB/01)	i. Active upon request only ii. For CSF send to lab immediately; for sputum ideally collect 3 consecutive specimens. A single well collected specimen is adequate.	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
50	Avian Influenza Viruses PCR / Nucleic Acid (H5, H7 & H9)	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
51	Bacterial identification, verification and confirmation	Pure Bacterial isolate	-	not applicable	4 weeks	Bacteriology Request Form (IMR/IBACT/FORMS/SMIS/01)	Preliminary tests must be performed first and results sent together with pure isolate and clinical history.	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
52	Bartonella serology (Cat scratch disease)	Blood	Gel tube	3.0 - 5.0 mL	2 weeks	PER-PAT 301	-	Microbiology	Hosp Sg Buloh

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
53	BCR-ABL1 Kinase Domain Mutation Analysis	Bone Marrow	EDTA tube	2.0 mL (2 tubes)	1 month	Molecular Analysis for Leukemia, IMR) Hemato-oncology Request Form Version 3.0	-	Hematology	Haematology IMR, NIH Setia Alam
54	BCR-ABL1 Qualitative Diagnostic Analysis	Bone Marrow	EDTA tube	2.0 mL (2 tubes)	1 month	Molecular Analysis for Leukemia, IMR) Hemato-oncology Request Form Version 3.0	-	Hematology	Haematology IMR, NIH Setia Alam
55	Beta-2-Microglobulins, serum	Blood	Gel tube	3.5 mL	10 working days	PER-PAT 301	-	Chemical Pathology	Hospital Ampang
56	Beta-2-Microglobulins, urine	Random Urine	Sterile container	10.0 mL	10 working days	PER-PAT 301	-	Chemical Pathology	Hospital Ampang
57	Bile acid, serum	Blood	Plain tube (Red Cap)	3.5 mL	14 working days	PER-PAT 301	Fasting sample. Suggest to send the sample on Tuesday. Referral lab run by batch only on Thursday.	Chemical Pathology	PPUM/ Hospital Selayang
58	Biogenic Amines, CSF	CSF	Sterile container	2.0 mL	1 month	IMR-IEM REQUEST FORM Version 6	Cover from light. Transport FROZEN. (Easily destroyed by heat)	Chemical Pathology	Biochemistry Unit, IMR KL
59	Biogenic Amines, urine	Random Urine	Sterile container	2.0 mL	1 month	IMR-IEM REQUEST FORM Version 6	Cover from light. Transport FROZEN. (Easily destroyed by heat)	Chemical Pathology	Biochemistry Unit, IMR KL

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
60	Dried blood spot (DBS)	Whatmann 903 Filter paper	3 circles of DBS	1 month	IMR-IM REQUEST FORM Version 6	Ensure blood completely dried before putting in plastic sheet. Wet and insufficient blood spot will be rejected.	Chemical Pathology	Biochemistry Unit, IMR KL
61	BKV PCR (BK Virus PCR)	EDTA : Spin and transfer into plain tube, label as plasma. Urine: Sterile container	Blood and Urine : 5.0 mL CSF : 0.5 - 2.0mL	1-2 weeks	PER-PAT 301	Serum will be rejected. Disease associated with patient with kidney transplant.	Microbiology	Hosp Sg Buloh
62	Bordetella pertussis culture and Identification	Sterile container	1.0 - 3.0 mLs	2 - 3 weeks	MKAK-BPU-U01/ Rev2018	Send ASAP after collection. Do not refrigerate.	Microbiology	MKAK Sg Buloh
63	Bordetella pertussis PCR	sterile container	1.0 - 2.0 mL	2 weeks	Bacteriology Request Form (IMR/BACT/FORMS/ SMIS/01)	-	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
64	Bordetella pertussis PCR	Sterile container	1.0 - 3.0 mLs	1 week	MKAK-BPU-U01/ Rev2018	Send immediately after collection at 2 °C – 8 °C	Microbiology	MKAK Sg Buloh
65	Borellia burgdorferi IgM & IgG (Lyme)	sterile container	3.0 - 5.0 mL	2 weeks	PER-PAT 301	-	Microbiology	Hosp Sg Buloh
66	Bruceella PCR	EDTA tube	2.0 mL (2 tubes)	2 weeks	Brucellosis Laboratory Request Form (IMR/IDRC/BACT/ BRUCE/02)	Transport at 2-8°C. Must be fresh specimen, taken prior to antibiotic treatment. Laboratory must be informed prior to sending specimen.	Microbiology	Bacteriology Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
67	Brucella Serology	Blood	Gel tube	2.0 mL	3 weeks	Brucellosis Laboratory Request Form (IMR/IDRC/BACT/BRUCE/02)	Transport 2-8.	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
68	Bruton Tyrosine Kinase (BTK) Genetic Test	Blood in EDTA tube	EDTA tube	10.0 mL	minimum of 3 months	Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF)	By appointment and consultation ONLY (A Mothers s blood is required to assist with interpretation). Screening result MUST showed Absence or less than 2% CD19+B cells and Low serum antibodies, reduced BTK protein expression	Microbiology	PID IMR NIH Setia Alam
69	Burkholderia pseudomallei IgM (Meliodosis)	Blood	Gel tube	2.0 - 3.0 mL	2 weeks	Bacteriology Request Form (IMR/BACT/FORMS/SMIS/01)	-	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
70	C-peptide	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	-	Chemical Pathology	Hospital Kuala Lumpur (HKL)
71	CA-MRSA PCR	Bacterial culture	Pure isolate	Pure isolate	2 weeks	Bacteriology Request Form (IMR/BACT/FORMS/SMIS/01)	PCR for mecA and PVL gene Send pure isolates with clinical history	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
72	Caeruloplasmin	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	-	Chemical Pathology	Hospital Kuala Lumpur (HKL)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
73	Cancer Antigen 125 (CA 125)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
74	Cancer Antigen 15 -3 (CA 15-3)	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	-	Chemical Pathology	Hospital Kuala Lumpur (HKL)
75	Cancer Antigen 19 -9 (CA 19-9)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
76	Carbamazepine	Blood	Plain tube (Red Cap)	3.5 mL	2 working days	TDM REQUEST FORM	Inpatient/Urgent case: Samples should be sent to the laboratory 90 mins before outsourcing to other hospital. Outpatient : Sunday, Monday & Thursday	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
77	Carbapenemase gene detection (PCR)	Bacterial culture	Blood agar or nutrient slant	Pure isolate	3 weeks	Bacteriology Request Form (IMR/BACT/FORMS/SMIS/01)	Send patient history with preliminary antibiotic susceptibility test results	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
78	Carcinoembryonic Antigen (CEA)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
79	Camitine Total & Free, Plasma	Blood	Heparin tube	3.5 mL	1 month	IMR-IEM REQUEST FORM Version 6	Separate plasma immediately	Chemical Pathology	Biochemistry Unit, IMR KL
80	Camitine,urine	24 hrs Urine	24 hrs urine container	as per collected	15 working days	IMR-IEM REQUEST FORM Version 6	By Consultation Only.	Chemical Pathology	Biochemistry Unit, IMR KL
81	CD4 count	Blood	EDTA tube	2.0 mL	2 weeks	PER-PAT 301	Sample must be sent to the lab on Monday as sample will be sent out to the referred lab every Tuesday only.	Hematology	Klinik Kesihatan Bakar Arang , Sungai Petani
82	Chikungunya qRT - PCR	Blood	Gel tube	5.0 -10.0 mL	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam
83	Cholinesterase, serum	Blood	Gel tube	3.5 mL	1 day (Urgent request) 5 working	PER-PAT 301	-	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
84	CMV DNA PCR	Blood, Urine	EDTA tube, Sterile container	5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hosp Sg Buloh
85	CMV IgG/IgM	Blood	Gel tube	3.0 - 5.0 mL	1 - 2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
86	Complement Component 3 (C3)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
87	Complement Component 4 (C4)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
88	Copper, serum	Blood	Trace Element tube (Royal Blue cap)	5.0 mL	10 working days	PER-PAT 301	Please call laboratory (3187) before sample collection.	Chemical Pathology	PPUM/ Hospital Selayang
89	Copper, urine	24 hrs urine	24 hrs urine container with preservative (acid wash)	20.0 mL	10 working days	PER-PAT 301	Samples must be collected using an appropriate container, free of heavy metal or trace elements.	Chemical Pathology	PPUM/ Hospital Selayang
90	Cortisol, serum	Blood	Gel tube	3.5 mL	1 day (Urgent request) 3 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
91	Cortisol, urine	24 hrs Urine	24 hrs urine container without preservatives	> 500.0 mL	5 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
92	Covid-19 PCR / Genexpert	Naso/ Oropharyngeal Swab	VTM in ice	-	3 days	PER-PAT 301	Please consult Medical Microbiologist before ordering.	Microbiology	Hospital Sultanah Bahiyah (HSB)
93	Covid-19 Serology	Blood	Gel tube	3.0 - 5.0 mL	2 working days	PER-PAT 301	Please consult Medical Microbiologist before ordering.	Microbiology	Hospital Sultanah Bahiyah (HSB)
94	Coxiella burnetti IgG & IgM	Blood	Gel tube	3.0 - 5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hosp Sg Buloh
95	Creatine & Guanidino acetate, Blood spot	Dried blood spot (DBS)	Whatmann 903 Filter paper	3 circles of DBS	20 working days	IMR-HEM REQUEST FORM Version 6	Ensure blood completely dried before putting in plastic sheet. Wet and insufficient blood spot will be rejected. Send at ambient temperature.	Chemical Pathology	Biochemistry Unit, IMR KL
96	Creatine & Guanidino acetate, Plasma	Blood	EDTA/Heparin tube	2.0 mL	20 working days	IMR-HEM REQUEST FORM Version 6	Separate plasma/ serum immediately. Send at ambient temperature.	Chemical Pathology	Biochemistry Unit, IMR KL

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
97	Random Urine	Sterile container	3.0 mL	20 working days	IMR-IEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
98	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
99	Blood	EDTA Tube	2.0 mL	1 week	TDM REQUEST FORM	The last sample must be sent to the laboratory before 8.30am; (1hour before) outsourcing to referral hospital at 9.30am. Please send the TDM samples to TDM Pharmacy on Sunday (office hour only)	Chemical Pathology	Hospital Pulau Pinang (HPP)
100	Random Urine	Sterile container	2.0 mL	17 working days	IMR-IEM REQUEST FORM Version 6	By Consultation Only.	Chemical Pathology	Biochemistry Unit, IMR KL
101	Blood	Heparin tube	4.0 mL (2 tubes)	2 months	Borang Perumahan Ujian Sitogenetik, Makmal Genetik, HTA, KL, HTA/ PATH.GEN/01-2021	Please contact Cytogenetic Lab HTA, KL for appointment	Hematology	Cytogenetic Lab, Hospital Tunku Azizah (HTA) KL
102	Bone marrow	Sodium Heparin tube	4.0 mL (2 tubes)	3 weeks	Bone Marrow Cytogenetics, Cytogenetic Lab, Haematology Unit, HPP- HPP/PAT/HM/SD/151	-	Hematology	Hospital Pulau Pinang (HPP)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
103	Cytokine Test Panel (IL-1B, IL-6, IL8 & TNF-A)	Blood	Gel tube	3.5 mL	21 working days	AUTOIMMUNE REQUEST FORM	By Appointment Only, Please contact Dr Fatimah: 016-	Chemical Pathology	Autoimmune Unit; IMR, NIH Setia Alam
104	Cytomegalovirus Isolation	<ul style="list-style-type: none"> i) Nasopharyngeal aspiration, ii) Nasopharyngeal swab, iii) Throat swab, iv) Throat gargle, v) BAL vi) Sputum, vii) Nasal swab, viii) Organ biopsies ix) Urine 	<ul style="list-style-type: none"> i) NPA: Sterile plastic vial contain 2.0 - 3.0 mL of VTM , ii) NPS / TS / NS : A flexible, swab in plastic vial contain 2.0 - 3.0 mL of VTM iii) Throat gargle / BAL / Sputum / Nasal swab : Sterile container iv) Biopsy: Sterile containers containing VTM v) Urine :in sterile plastic container 	<ul style="list-style-type: none"> i) NPA: AS much as possible ii) Biopsy: remove portions, about 1.5cm cube of various parts of affected organs moist iii) Urine :1.0 - 3.0 mLs in sterile plastic container ix) ix) Others : Not applicable 	1 - 2 months	Virology Test Request Form (IMR/DRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
105	Dehydroepiandrosterone Sulfate (DHEAS)	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	Chemical Pathology	Hospital Kuala Lumpur (HKL)
106	Delta-Amino Levulinic Acids (Delta-ALA), urine	Random Urine	Sterile container	2.0 mL	1 month	IMR-IEM REQUEST FORM Version 6	Chemical Pathology	Biochemistry Unit, IMR KL
107	Dengue Multiplex qRT - PCR (Inclusive of DEN1, DEN2, DEN3 & DEN4)	i) Blood ii) CSF, iii) Organ biopsies	i) Plain tube ii) EDTA tube iii) CSF: sterile container iv) Organ biopsy: Sterile containers containing VTM to keep tissue moist	i) Blood : 1.0 - 3.0 mL ii) CSF: 1.0 - 3.0 mL iii) organ biopsy: remove portions, about 1.5cm cube of various parts of affected organs	2 - 3 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	Microbiology	Virology Unit, IMR, NIH Setia Alam
108	Dengue Serotype and Genotype / Dengue PCR	Blood	Gel tube	2.0 - 4.0 mL	2 - 3 weeks	LABORATORY REQUEST FORM FOR DENGUE AND FLAVIVIRUS (MKAK-BPU-D02 (rev_Nov_2015))	Microbiology	MKAK Sg Buloh
109	Diabetes Antibodies Panel: Anti Islet Cells (ICA), Anti-Glutamic Acid Decarboxylase (GAD) & Anti-Insulinoma-	Blood	Plain tube (Red Cap)	Adult: 4.0 mL Paeds: 1.0 mL	20 working days	IMR-ENDOCRINE REQUEST FORM	Chemical Pathology	Endocrine Unit IMR, NIH Setia Alam

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
110 Digoxin	Blood	Plain tube (Red Cap)	3.5 mL	2 working days	TDM REQUEST FORM	Inpatient/Urgent case: Samples should be sent to the laboratory 90 mins before outsourcing to other hospital. Outpatient : Sunday, Monday & Thursday	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
111 Dihydrorhodamine assay (DHR)	Blood	Lithium Heparin	2.0 mL (Patient) 2.0 mL (Healthy person)	2 - 3 weeks	Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF)	Samples must reach Primary Immunodeficiency (PID) Unit, before 1 pm on appointment date. Please call to inform if there is any delay/	Microbiology	PID IMR NIH Setia Alam
112 DNA analysis of the alpha globin gene	Blood	EDTA tube	2.0 mL	3 months	DNA analysis for thalassaemia syndromes and haemoglobinopathies – Date of issue 03.01.2023, Version 4.1	-	Hematology	Hospital Sultanah Bahiyah (HSB)
113 DNA analysis of the beta globin gene/Thalassaemia syndromes & Haemoglobinopathies	Blood	EDTA tube	2.0 mL	4 months	DNA analysis for thalassaemia syndromes and haemoglobinopathies – Date of issue 03.01.2023, Version 4.2	-	Hematology	Haematology IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
114	DNA extraction and Storage	Blood	EDTA tube	2.0 mL (2 tubes)	7 days	Borang Permohonan Molekular Genetik, Makmal Genetik, HTA, KL, HTA/PAT/GEN/PK-01-02	-	Hematology	Molecular Lab, Hospital Tuanku Azizah (HTA), KL
115	Drugs, blood	Blood	Sodium Fluoride tube	2.0 mL (5 tubes)	6 months	Borang Permohonan Bagi Pemeriksaan Forensik/Toksikologi (Kimia 15-Pin.1/2004)	-	Chemical Pathology	Jabatan Kimia Pulau Pinang
116	Drugs, urine	Urine	Sterile container	25.0 mL	6 months	Borang Permohonan Bagi Pemeriksaan Forensik/Toksikologi (Kimia 15-Pin.1/2004)	-	Chemical Pathology	Jabatan Kimia Pulau Pinang
117	Ebola Virus PCR	After consultation only	After consultation only	After consultation only	2 - 3 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
118	EBV IgG/IgM (infectious mononucleosis) (EBV : Epstein-Barr Virus)	Blood	Gel tube	3.0 - 5.0 mL	1 - 2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
119	Enterovirus Isolation (Enterovirus 71, Coxsackie A and Coxsackie B, Echovirus, Other non enteroviruses)	i) Nasopharyngeal aspirate, Nasopharyngeal swab, Throat swab, Nasal swab, ii) Throat gargle/ BAL / Sputum iii) Organ biopsies / Pericardial aspirate iv) Rectal swab, v) Stool vi) Vesicular Swab/Scraping	i) NPA / NPS / TS / NS : Sterile vial contain 2-3ml of VTM ii) Throat gargle: / BAL / Sputum : sterile container iii) Organ biopsy / Pericardial aspirate: sterile container with 2-3ml VTM iv) Rectal swab: Sterile vial contain 2-3ml of VTM v) Stool / Vesicular swab /scraping: Sterile container	i) NPA: As much as possible ii) Other : Not applicable	3 - 5 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam
120	Enterovirus qRT - PCR (Inclusive of Pan Entero, EV71 and CA16)	i) Nasopharyngeal aspirate, Nasopharyngeal swab, Throat swab, Nasal swab, ii) Throat gargle/ BAL / Sputum iii) Organ biopsies / Pericardial aspirate iv) Rectal swab, v) Stool vi) Vesicular Swab/Scraping	i) NPA / NPS / TS / NS : Sterile vial contain 2-3ml of VTM ii) Throat gargle: / BAL / Sputum : sterile container iii) Organ biopsy / Pericardial aspirate: sterile container with 2-3ml VTM iv) Rectal swab: Sterile vial contain 2-3ml of VTM v) Stool / Vesicular swab /scraping: Sterile container	i) NPA: As much as possible ii) Other : Not applicable	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
121	Eosinophilic Cationic Protein (ECP)	Blood	Gel tube	3.0 - 5.0 mL	2 weeks	Request form will be emailed to requester if request is granted.	Please call Dr Husna Farhanah Ahmad at 03 3362 7638/012 5290179 for	Microbiology	Allergy Unit, IMR NIH Setia Alam
122	Epstein-Barr virus (EBV) PCR	Blood, CSF, BAL	EDTA, Sterile container	Blood and BAL :5.0 mL CSF 0.5 - 2.0 mL		PER-PAT 301	-	Microbiology	Hosp Sg Buloh
123	Estradiol	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
124	Everolimus	Blood	EDTA Tube	2.0 mL	1 week	TDM REQUEST FORM	Please contact TDM Pharmacy for any request. Please send samples to TDM Pharmacy on Sunday during office hours.	Chemical Pathology	Hospital Kuala Lumpur (HKL)
125	Extractable Nuclear antigen (ENA) -Anti Jo 1, Anti Scl-70, Anti SSA/ Anti Ro, Anti SSB/ Anti La, Anti Scl - 70, Anti Smith (Anti Sm)	Blood	Gel tube	3.5 mL	2 - 3 weeks	PER-PAT 301	-	Microbiology	Hospital Tuanku Fauziah, Kangar, Perlis
126	Factor assays (Factor II, V, VII, XI, XII, XIII)	Blood	Sodium Citrate tube	1.8 mL (3 tubes)	21 days	PER-PAT 301	-	Hematology	Haemostasis Lab, Hospital Tuanku Azizah (HTA), KL
127	Factor assays (Factor VIII and Factor IX)	Blood	Sodium Citrate tube	1.8 mL (2tubes)	1 week	PER-PAT 301	-	Hematology	Hospital Sultanah Bahiyah (HSB)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
128	Filariasis PCR	Blood, Slides, filter paper	EDTA tube or slide mailer or seal plastic bag	2.5 mL	1 - 2 weeks	PER-PAT 301	Blood taken between 6pm-12am	Microbiology	Parasitology Unit, IMR NIH Setia Alam
129	Filariasis Serology	Blood	Gel tube/EDTA	2.0 mL	1 week	PER-PAT 301	Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
130	Fine Needle Aspiration (FNA)	Aspirated fluid from various organ	Slide	As collected	Urgent : 1 week Routine : 3 weeks	PER-PAT 301	Contact lab immediately (ext : 3190) before procedure	Microbiology	Cytopathology Unit, HSAH
131	FISH test	Blood	Heparin tube	4.0 mL	1 month	Borang Perumahan Molekular Genetik, Makmal Genetik, HTA, KL, HTA/PAT/GEN/PK-01-02	-	Hematology	Molecular Lab, Hospital Tuanku Azizah (HTA), KL
132	Folate	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
133	Follicle Stimulating Hormone (FSH)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
134	Free Light Chain, serum	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Pulau Pinang (HPP)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
135	Fructosamine	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	-	Chemical Pathology	Hospital Ampang
136	Fungal Identification	Fungal isolate	Pure clinical fungal isolate. Mixed growth will be rejected	Pure isolate	7 weeks	Mycology Request Form (IMR/IDRC/BACT/ MYCO/01)	Agar or media which support the growth such as Sabouraud dextrose agar or Potato dextrose agar preferably which contains antibiotics such as chloramphenicol and/ or gentamicin. Purify the culture and send pure culture with a sufficient clinical history. Transport condition: ambient temperature. Attach any preliminary test results	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
137	Fungal PCR	Fresh clinical specimens : Blood, CSF and other sterile body fluids, tissue biopsies; FPPE	i. Blood in EDTA or Gel tube. ii. FPPE, tissue and other body fluids in sterile container.	2.0 mL blood; other samples as much as possible	2 weeks	Mycology Request Form (IMR/IDRC/BACT/ MYCO/01)	For better sensitivity, blood samplings should be repeated 2 or 3 times, at 3-4 hours interval. Transportation at ambient temperature. If delayed keep at 2-8°C	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
138	G6PD assay	Blood	EDTA tube	3.0 mL	1 week	PER-PAT 301	Appointment must be made by the attending Doctor & must be paid to Hematology Lab PPUKM	Hematology	PPUKM Cheras, KL.

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
139	Galactosemia Screening, Blood Spot	Dried blood spot (DBS)	Whatmann 903 Filter paper	3 circles of DBS	2 weeks	IMR-HEM REQUEST FORM Version 6	Ensure blood completely dried before putting in plastic sheet. Wet and insufficient blood spot will be rejected. Send at ambient temperature. If >3 hrs, keep sample cooled. Protect from freezing	Chemical Pathology	Biochemistry Unit, IMR KL
140	Gamma Glutamyl Transferase (GGT)	Blood	Gel tube	3.5 mL	1 day	PER-PAT 301	-	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
141	Gastric Lavage Toxicology	Body Fluid	Sterile container	25.0 mL	6 months	Borang Permohonan Bagi Pemeriksaan Forensik/Toksikologi (Kimia 15-Pin.1/2004)	-	Chemical Pathology	Jabatan Kimia Pulau Pinang
142	Growth Hormone (Somatotrophin), serum	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	Fasting sample.	Chemical Pathology	Hospital Kuala Lumpur (HKL)
143	Hanta Pulmonary Syndrome (Sin Nombre Orthohantavirus)	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
144	Hanta Renal Syndrome (Seoul & Hantaan Virus)	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
145	Haptoglobin	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	-	Chemical Pathology	Hospital Kuala Lumpur (HKL)
146	Heavy Metal : Mercury	Random Urine	Sterile container	20.0 mL	7 working days	BORANG PERMOHONAN UJIAN MAKMAL (SPESIMEN KLINIKAL) MIKAK MIKAK-BPU-U01/RevZ018	By Appointment Only. Suggest to send the sample on Monday. Referral lab run by batch only on Thursday.	Chemical Pathology	MKAK Sg. Buloh
147	Helminth Culture	Fresh stool not Fixed	Sterile container	NA	2 - 3 weeks	PER-PAT 301	Fresh stool in plain container (specimen to reach lab within 24hr at room temperature)	Microbiology	Parasitology Unit, IMR NIH Setia Alam
148	Helminth Macroscopy/ Microscopy	Fresh stool/Adult worm/Larvae/ Fixed stool	Sterile container	5 gram	2 - 3 weeks	PER-PAT 301	Fresh specimen. Adult worm/Larvae in sterile saline (specimen to reach lab within 24hr at room temperature) (Before REFERRAL, Initial ID parasite to determine by customer)	Microbiology	Parasitology Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
149	Hepatitis A IgM virus Antibody	Blood	Gel tube	3.0 - 5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
150	Hepatitis B core antibody, total (HBcAb)	Blood	Gel tube	3.0 - 5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
151	Hepatitis B core IgM (HBc IgM) Antibody	Blood	Gel tube	3.0 - 5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
152	Hepatitis B envelope Antibody (HBeAb) - Hepatitis Marker	Blood	Gel tube	3.0 - 5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
153	Hepatitis B envelope Antigen (HBeAg) - Hepatitis Marker	Blood	Gel tube	3.0 - 5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
154	Hepatitis B virus DNA viral load	Blood	EDTA tube	2.5 mL (2 tubes)	4 weeks	PER-PAT 301	Signature of Gastroenterologist	Microbiology	Hospital Sultanah Bahiyah (HSB)
155	Hepatitis C Genotyping	Blood	Gel tube/ EDTA	1.0 - 3.0 mL	6 – 8 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
156	Hepatitis C RNA PCR	Blood	Gel tube	1.0 - 3.0 mLs	2 – 4 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam
157	Hepatitis C virus RNA viral load	Blood	EDTA tube	2.5 mL (2 tubes)	4 weeks	PER-PAT 301	Signature of Gastroenterologist	Microbiology	Hospital Sultanah Bahiyah (HSB)
158	Hepatitis D virus (HDV) IgM Antibody	Blood	Gel tube/ EDTA	1.0 - 3.0 mL	1-2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
159	Hepatitis D Virus (HDV) PCR	Blood	EDTA tube	1.0 - 3.0 mLs	1-2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
160	Hepatitis E virus (HEV) IgM Antibody	Blood	Gel tube/ EDTA	1.0 - 3.0 mL	1-2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
161	Hepatitis E Virus (HEV) PCR	Blood	EDTA tube	1.0 - 3.0 mLs	1-2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
162	Herpes Simplex Virus (HSV) I/2 PCR	Plasma, CSF, Urine	EDTA tube Sterile Bijou bottle Sterile container	Blood and Urine :5.0 mL CSF 0.5 - 2.0 mL	1 - 2 weeks	PER-PAT 301	Spin and label as plasma	Microbiology	Hosp Sg Buloh

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
163	Herpes Simplex Virus 1&2 IgG/ IgM	Blood	Gel tube	3.0 - 5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
164	Herpes Virus Isolation (Herpes Simplex 1& 2)	i)Nasopharyngeal swab, ii)Throat swab, iii) Cardiac biopsy, iv) Rectal swab, v) Stool, vi) Pericardial aspirate vii) Vesicular swab/scraping viii) Eye swab, lacrimal tears	i) NPS/ TS: Sterile plastic vial contain 2.0 - 3.0 mL of VTM ii) organ biopsy: Sterile containers containing VTM to keep tissue moist iii) Rectal swab / Pericardial aspirate: Sterile plastic vial contain 2.0 - 3.0 mL of VTM iv) Stool: Sterile container v) Vesicular swab/ scrapping: Sterile container with 2.0 - 3.0 mLs of VTM vi) Eye swab: Sterile plastic vial contain 2.0 - 3.0 mL of VTM , Lacrimal tears: In capillary tube	i) NPS: NA. Use different swab for each nostrils ii) TS: NA iii) biopsy: about 1.5cm cube of various parts of affected organs iv) Rectal swab: NA. moistened with distilled water v) Stool: >5gm (thumb size) vi) Vesicular Swab/ Scrapping: NA vii) Eye swab: Sterile swab moistened with distilled water , Lacrimal tears: 10.0 -20.0 ul tears	3 – 5 weeks	Virology Test Request Form (IMR/IDRC/ VIRO/ ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
165	Histopathological Examination (HPE)	Small biopsy/fresh tissue/surgical resection	According to size of specimen (Fixed in 10% neutral buffered formalin solution) Volume of formalin at least 10 times the	Not applicable	Urgent (small biopsy) : 3 days Routine : 14 days		Fill form completely with clearly written name of Doctor's incharge and phone number to be contacted if there is any inquiry.	Histopathology MLT incharge	Histopathology Unit; HSAH
166	HIV Drug Resistance Test (Integrase)	Blood	EDTA tube	5.0 - 10.0 mL blood	2 months	HIV Genotyping Resistance Testing (IMR/Viro/HIV/24)	Please fill in IMR/Viro/HIV/24 form in IMR Handbook, Treatment failure patient, patient's viral load must be >1000, transport in DRY ICE	Microbiology	Virology Unit, IMR, NIH Setia Alam
167	HIV Drug Resistance Test (Protease and Reverse Transcriptase)	Blood	EDTA tube	5.0 - 10.0 mL blood	2 months	HIV Genotyping Resistance Testing (IMR/Viro/HIV/24)	Please fill in IMR/Viro/HIV/24 form in IMR Handbook, Treatment failure patient, patient's viral load must be >1000, transport in DRY ICE	Microbiology	Virology Unit, IMR, NIH Setia Alam
168	HIV RNA viral load	Blood	EDTA tube	2.5 mL (4 tubes)	4 weeks	PER-PAT 301	Countersigned by specialist	Microbiology	Hospital Sultanah Bahiyah (HSB)

TESTS	TYPE OF SAMPLE	CONTAINER/ PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
169 HIV-1 RNA RT PCR for babies (0-18 months)	Blood	EDTA tube	Paeds : 0.5 mL (4 tubes) Mother : 2.0 mL (1 tube) do not spin	2 weeks	Ujian Polymerase Chain Reaction (PCR) Untuk Human Immunodeficiency Virus (HIV) Di Kalangan Bayi	Mother must be HIV positive, Transport in ice	Microbiology	Virology Unit, IMR, NIH Setia Alam
170 HIV-2 qRT-PCR	Blood	EDTA tube	2.5 mL	2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ ADMIN/53)	By consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
171 Homocysteine Total, Plasma	Blood	EDTA tube	2.0 mL	1 month	IMR-LEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
172 Human Leukocyte Antigens (HLA) Antibody Test Panel Reactive Antibody(PRA)/ Donor Specific	Blood	Gel tube	3.0 mL (3 tubes)	6 – 8 weeks	HLA Antibody Test Request Form (PRA/ DSA) (IMR/AIRC/TI/RF-4)	Appointment is not required. For transplant recipient only (screening test)	Microbiology	Transplantatio n Immunology IMR NIH Setia Alam
173 Human Leukocyte Antigens (HLA) Crossmatch (Complement Dependent Cytotoxicity)	Blood	Sodium Heparin (donor), Gel tube (patient)	18 ml (donor), 5 ml (patient)	6 – 8 weeks	HLA Crossmatch Test Request Form (Living Donor) (IMR/AIRC/TI/RF-1)	For solid organ transplantation	Microbiology	Transplantatio n Immunology IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
174	Human Leukocyte Antigens (HLA) Crossmatch (Flow Cytometry)	Blood	Sodium Heparin (donor), Gel tube (patient)	18 ml (donor), 5 ml (patient)	6 – 8 weeks	HLA Crossmatch Test Request Form (Living Donor) (IMR/AIRC/TI/RF-1)	For solid organ transplantation	Microbiology	Transplantation Immunology IMR NIH Setia Alam
175	Human Leukocyte Antigens (HLA) Typing Class I (Loci A, B and C) - Low/medium resolution (SSO/	Blood	EDTA tube	2.0 mL (3 tubes)	6 – 8 weeks	HLA Typing Test Request Form (IMR/AIRC/TI/RF-2)	Transplantation (SOT/ BMT/HSCT) -loci A,B and C	Microbiology	Transplantation Immunology IMR NIH Setia Alam
176	Human Leukocyte Antigens (HLA) Typing Class I and II (Loci A, B and DR) - Medium/ High Resolution	Blood	EDTA tube	2.0 mL (3 tubes)	6 – 8 weeks	HLA Typing Test Request Form (IMR/AIRC/TI/RF-2)	New case (BMT/HSCT screening) / Add donor for existing case	Microbiology	Transplantation Immunology IMR NIH Setia Alam
177	Human Leukocyte Antigens (HLA) Typing Class I and II (Loci A, B, C, DR and DQ) - high resolution (SSO-	Blood	EDTA tube	2.0 mL (3 tubes)	6 – 8 weeks	HLA Typing Test Request Form (IMR/AIRC/TI/RF-2)	1. Confirmatory typing (BMT/ HSCT) - high resolution reporting 2.Match unrelated donor (MUD)	Microbiology	Transplantation Immunology IMR NIH Setia Alam
178	Human Leukocyte Antigens (HLA) Typing Class I and II (Loci A, B, C, DR and DQ) - low resolution (PCR)	Blood	EDTA tube	2.0 mL (3 tubes)	6 – 8 weeks	HLA Typing Test Request Form (IMR/AIRC/TI/RF-2)	1. New case / add donor for existing case (Nephrology/other SOT) 2. Confirmatory typing (BMT/ HSCT)	Microbiology	Transplantation Immunology IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
179	Human Leukocyte Antigens (HLA) Typing Class II (Loci DR, DQ) - Low/medium resolution (SSO/ SSP-PCR)	Blood	EDTA tube	2.0 mL (3 tubes)	6 – 8 weeks	HLA Typing Test Request Form (IMR/AIRC/TI/RF-2)	Transplantation (SOT/ BMT/HSCT) -loci DR and DQ.	Microbiology	Transplantation Immunology IMR NIH Setia Alam
180	Human Leukocyte Antigens (HLA) Typing for Disease Association per loci	Blood	3 EDTA tubes	2.0 mL each	6 – 8 weeks	HLA Typing Test Request Form (Disease Association) (IMR/AIRC/TI/RF-3)	Disease association (e.g B27, B15:02, B57:01 etc)	Microbiology	Transplantation Immunology IMR NIH Setia Alam
181	Hydatid Disease / Echinococcosis Diagnosis - Serology	Blood	Gel tube/ EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	ELISA / Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
182	IgE, Specific (per allergan)	Blood	Gel tube	3.0 - 5.0 mL blood (Minimum 1 tube)	2 weeks	IMR Allergy Request Form (IMR/AIRC/ Allergy/RF)	-	Microbiology	Allergy Unit, IMR NIH Setia Alam
183	IgE, Total	Blood	Gel tube	3.0 mL blood	2 weeks	IMR Allergy Request Form (IMR/AIRC/ Allergy/RF)	-	Microbiology	Allergy Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
184	Immunoglobulin A (Ig A)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
185	Immunoglobulin G (Ig G)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
186	Immunoglobulin M (Ig M)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
187	Immunophenotyping	Blood / Bone marrow sample	EDTA tube	2.0 mL (2 tubes)	Verbal : 36 hrs (for acute leukemia cases)	PER-PAT 301	-	Hematology	Specialised Haematology Lab, Hospital Tuanku Azizah (HTA), KL
188	Inborn Error Metabolism (IEM) Screening, Blood Spot	Dried blood spot (DBS)	Whatmann 903 Filter paper	3 circles of DBS	3 working days	IMR-IEM REQUEST FORM Version 6	Ensure blood completely dried before putting in plastic sheet. Wet and insufficient blood spot will be rejected. Send at room temperature.	Chemical Pathology	Biochemistry Unit, IMR KL

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
189 Influenza A and B qRT - PCR	i) Nasopharyngeal aspiration, ii) Nasopharyngeal swab, iii) Throat swab, iv) Throat gargle, v) BAL vi) Sputum, vii) Nasal swab, viii) Organ biopsies	i) NPA / NPS / TS / NS: Sterile plastic vial contain 2.0 - 3.0 mL of VTM ii) Throat gargle / Sputum: sterile container iii) BAL: sterile container iv) Biopsy: Sterile containers containing VTM to keep tissue moist	i) NPA: Mucous secretion in VTM ii) NPS: NA. Use different swab for each nostrils iii) TS / Nasal swab: Sterile swab. Use different swabs for each nostrils , iv) Biopsy: about 1.5cm cube of various parts of affected organs	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam
190 Influenza Subtyping (pdm09 and H3 seasonal) qRT-PCR	i) Nasopharyngeal aspiration, ii) Nasopharyngeal swab, iii) Throat swab, iv) Throat gargle, v) BAL vi) Sputum, vii) Nasal swab, viii) Organ biopsies	i) NPA / NPS / TS / NS: Sterile plastic vial contain 2.0 - 3.0 mL of VTM ii) Throat gargle / Sputum: sterile container iii) BAL: sterile container iv) Biopsy: Sterile containers containing VTM to keep tissue moist	i) NPA: Mucous secretion in VTM ii) NPS: NA. Use different swab for each nostrils iii) TS / Nasal swab: Sterile swab. Use different swabs for each nostrils , iv) Biopsy: about 1.5cm cube of various parts of affected organs	2 - 3 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
191	Inhibitor study	Blood	Sodium Citrate tube	1.8 mL (2tubes)	Urgent: 2 days Non urgent: 3 weeks	PER-PAT 301	-	Hematology	Hospital Sultanah Bahiyah (HSB)
192	Insulin	Blood	Gel tube	3.5 mL	2 months	PER-PAT 301	-	Chemical Pathology	Hospital Kuala Lumpur (HKL)
193	Insulin Auto Antibodies (IAA)	Blood	Plain tube (Red Cap)	Adult: 4.0 mL Paeds: 1.0 mL	20 working days	IMR-ENDOCRINE REQUEST FORM	Send immediately to the lab after specimen collection (stability : 2-8°C (3 days) -20°C (up to 6 months) MANDATORY authorization by Specialist is required	Chemical Pathology	Endocrine Unit IMR, NIH Setia Alam
194	Insulin like Growth Factor-1 (IGF-1)	Blood	Gel tube	3.5 mL	21 working days	PER-PAT 301	-	Chemical Pathology	Hospital Putrajaya (HPI)
195	Iodine	Urine	Sterile container	10.0 mL	25 working days	BORANG PERMOHONAN UJIAN MAKMAL (SPESIMEN KLINIKAL) MIKAK MIKAK-BPU-U01/ Rev2018	Suggest to send the sample on Monday. Referral lab run by batch only on Thursday. MANDATORY authorization by Specialist is required	Chemical Pathology	MKAK Sg. Buloh

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
196	Japanese Encephalitis JE PCR	Blood or CSF	Bijoux bottle	1.0 mL	1 - 2 weeks	MKAK-BPU-U01/Rev2018	<ol style="list-style-type: none"> Sample should be collected within 5 days from onset of illness. A brief concise history of illness and physical findings is required especially the date of onset of illness and date of sample collection. After sample is collected, immediately send the sample to the laboratory. If there is any delay, keep the sample at 2-8°C up to 48 hours. If exceeding 48 hours, the sample should be stored at -70°C. 	Microbiology	MKAK Sg Buloh
197	Japanese Encephalitis JE Serology	Blood	Gel tube	2.0 - 4.0 mL	1 - 2 weeks	MKAK-BPU-U01/Rev2018	<ol style="list-style-type: none"> Sample should be collected within 5 days from onset of illness. A brief concise history of illness and physical findings is required especially the date of onset of illness and date of sample collection. After sample is collected, immediately send the sample to the laboratory. If there is any delay, keep the sample at 2-8°C up to 48 hours. If exceeding 48 hours, the sample should be stored at -70°C. 	Microbiology	MKA Ipoh

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
198	JE qRT - PCR (Japanese Encephalitis)	i) Blood ii) CSF iii) Organ biopsies	i) Gel tube or EDTA tube ii) CSF: sterile container iii) Organ biopsy: Sterile containers containing VTM to keep tissue moist	i) Blood : 1.0 - 3.0 mL ii) CSF: 1.0 - 3.0 mL iii) organ biopsy: remove portions, about 1.5cm cube of various parts of affected organs	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam
199	Lassa Virus PCR	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
200	Legionella antigen	Urine	Sterile container	5.0 mL	1 week	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
201	Leishmaniasis Microscopy	Blood, Lymph biopsy film, Bone marrow film	Slide mailer or EDTA Tube	2.5 mL	1 - 2 weeks	PER-PAT 301	Send sample in ice (Before REFERRAL, Initial ID parasite to determine by customer)	Microbiology	Parasitology Unit, IMR NIH Setia Alam
202	Leishmaniasis PCR (Temporary discontinue)	Blood, skin / tissue scrapings	EDTA tube, filter paper, sterile container	2.5 mL	1 - 2 weeks	PER-PAT 301	Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
203	Leishmaniasis serology	Blood	Gel tube/EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	EIA. Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCE D TO
204	Leptospira microscopic agglutination test (MAT)	Blood	Gel tube	3.0 mL	2 weeks		-	Microbiology	MKA Ipoh
205	Leptospira PCR	i) Blood ii) Sterile body fluids, CSF, bronchial lavage, tissue biopsies/ post mortem samples.	i) EDTA ii) Sterile container	i) 2.0 mL ii) NA	2 weeks	Leptospirosis Laboratory Request Form (IMR/IDRC/BACT/LEPTO/01)	i) For ICU cases & after consultation only ii) For better sensitivity, blood samplings should be repeated 2 or 3 times, at 3-4 hours interval and before antibiotics introduction. iii) Transportation at ambient temperature. If delayed keep at 2-8°C	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
206	Leptospiral culture	Blood	Heparin tube	4.0 mL	1 month	Leptospirosis Laboratory Request Form (IMR/IDRC/BACT/LEPTO/01)	Sampling should be done before antibiotic treatment	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
207	Leukemia Translocation Study (Molecular test)	Bone Marrow/ peripheral blood	EDTA tube	2.0 mL (2 tubes)	1 month	Molecular Analysis for Leukemia, IMR) Hemato-oncology Request Form Version 3.0	-	Hematology	Haematology IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
208	Lithium	Blood	Gel tube	3.5 mL	5 days	PER-PAT 301	The last sample must be sent to the laboratory before 8.30am; (1hour before) outsourcing to another hospital at 9.30am. Please send the TDM samples to TDM Pharmacy on Sunday (office hour only)	Chemical Pathology	Hospital Pulau Pinang (HPP)
209	Lupus Anticoagulant	Blood	Sodium Citrate tube	1.8 mL (2tubes)	3 weeks	PER-PAT 301	-	Hematology	Hospital Sultanah Bahiyah (HSB)
210	Luteinising Hormone (LH)	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
211	Lymphocyte Activation Test	Blood	EDTA	5.0 mL	1 - 2 weeks	Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF)	By appointment and consultation only (A healthy control sample is required to assist with interpretation)	Microbiology	PID IMR NIH Setia Alam
212	Lymphocyte Subset Enumeration Test (TBNK)/ T and B cells Enumeration	Blood	EDTA	2.0 mL	2 - 3 weeks	Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF)	By Appointment only. Samples must reach Primary Immunodeficiency (PID) Unit, before 1 pm on appointment date. Please call to inform if there is any delay/cancellation."	Microbiology	PID IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
2.13	Lysine Metabolism Profile, urine	Random Urine	Sterile container	2.0 mL	15 working days	IMR-IEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
2.14	Lysosomal Storage Disease Enzyme Assays- Panel I Test	Whole blood	EDTA tube	2.0 ml (3 tubes)	1 month	IMR-IEM REQUEST FORM Version 6	Do not spin, Do not FREEZE, send whole blood. Option maximum up to 2 diseases of enzyme. MANDATORY authorization by Specialist is required	Chemical Pathology	Biochemistry Unit, IMR KL
2.15	Lysosomal Storage Disorders (LSD) screening, blood spot	Dried blood spot (DBS)	Whatmann 903 Filter paper	3 circles of DBS	2 weeks	IMR-IEM REQUEST FORM Version 6	Ensure blood completely dried before putting in plastic sheet. Wet and insufficient blood spot will be rejected.	Chemical Pathology	Biochemistry Unit, IMR KL
2.16	Malaria PCR	Blood, Dried blood (filter paper), Thick/ thin blood film (Giemsa stained)	slide mailer or EDTA tube or seal plastic bag	2.5 mL	1 - 2 weeks	PER-PAT 301	Blood sample in ice, filter paper seal in plastic bag at RT, Thick & Thin Film at RT	Microbiology	Parasitology Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
217	Malaria Serology	Blood	Gel tube/EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	Immunofluorescent Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
218	Marburg PCR	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
219	Measles PCR	i) Throat swab ii) NP secretion iii) Tracheal aspirate iv) Urine	Throat swab : Sterile container with 2.0-2.5 ml of VTM Others: Sterile container	1.0 - 3.0 mL	2 - 3 weeks	Measles: Borang Permohonan dan Keputusan Ujian Makmal MSLF:01/2004	Respiratory secretion (nasopharyngeal specimen) should be taken 1 – 7 days of rash onset.	Microbiology	MKAK Sg Buloh
220	Measles Serology	Blood	Gel tube	2.0 - 4.0 mL	2 weeks	Measles: Borang Permohonan dan Keputusan Ujian Makmal MSLF:01/2004	Collect sample anytime up to 28 days of rash onset.	Microbiology	MKAK Sg Buloh
221	MERS-CoV (Coronavirus) PCR	Sputum, throat swab/ oral swab	Fluids : Sterile container, Swabs : Viral transport media in ice	NA	2 days	BORANG PERMOHONAN UJIAN MERS-COV	Please call Microbiology Unit for packaging	Microbiology	Hospital Sultanah Bahiyah (HSB)

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
222 Metanephrine, urine	24 hrs urine	24 hrs urine container with 10.0 mL of 25% hydrochloric acid (HCL)	Minimum: 750.0 mL (Adult 18yo above)	30 working days	PER-PAT 301	Ensure the 24hrs urine container have preservatives before collection of urine. MANDATORY authorization by Specialist is required. Please call Chemical Pathologist (ext 3189) before sending sample.	Chemical Pathology	Hospital Putrajaya (HPJ)
223 Methanol, blood	Blood	Sodium Fluoride tube	2.0 mL (5 tubes)	14 working days	BORANG PERMOHONAN UJIAN MAKMAL (SPESIMEN KLINIKAL) MKAK MKAK-BPU-U01/Rev2018	Suggest to send the sample on Monday. Referral lab run by batch only on Thursday. MANDATORY authorization by Specialist is required & stated the requestor phone number.	Chemical Pathology	MKAK Sg. Buloh
224 Methanol, urine	Urine	Sterile container	25.0 mL	14 working days	BORANG PERMOHONAN UJIAN MAKMAL (SPESIMEN KLINIKAL) MKAK MKAK-BPU-U01/Rev2018	Please divide and transfer urine into 3 tubes of Sodium Fluoride Suggest to send the sample on Monday. Referral lab run by batch only on Thursday. MANDATORY authorization by Specialist is required & stated the requestor phone number.	Chemical Pathology	MKAK Sg. Buloh

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
225	Methotrexate (MTX)	Blood	Plain tube (Red Cap)	3.5 mL	2 working days	TDM REQUEST FORM	Inpatient/Urgent case: Samples should be sent to the laboratory 90 mins before outsourcing to other hospital.	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
226	Microalbumin / Albumin:Creatinine Ratio (ACR)	Random Urine	Sterile container	5.0 - 10.0 mL	2 working days	PER-PAT 301	First morning void is preferred	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg.Petani.
227	Molecular BCR-ABL1 Qualitative	Blood	EDTA tube	2.0 mL (2 tubes)	21 days	PER-PAT 301	-	Hematology	Molecular Lab, Hospital Tuanku Azizah
228	Molecular Genetic Testing : i. DNA extraction ii. Rett Syndrome iii. Duchenne Muscular Dystrophy iv. Becker Muscular Dystrophy v. Beckwith-Wiedemann Syndrome vi. Russell-Silver Syndrome vii. Y-Microdeletion viii. Comparative Genomic Hybridization (CGH) Microarray	Blood	EDTA tube	2.0 mL (2 tubes)	3-6 months	Borang Permohonan Molekular Genetik, Makmal Genetik, HTA, KL, HTA/PAT/GEN/PK-01-02	-	Hematology	Hospital Tuanku Azizah (HTA), KL

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
229	Molecular study : EGFR mutation testing (Cancer Genetic)	Tissue	Tissue block	-	3-6 months	Borang Perumahan Molekular Genetik, Makmal Genetik, HTA, KL, HTA/PAT/GEN/PK-01-02	To call Histopathologist HSAH for Tissue block request & fill up special form	Hematology Hospital Tuanku Azizah (HTA), KL
230	Molecular study for Calreticulin	Blood	EDTA tube	2.0 mL	8 weeks	Hospital Ampang Special Haematology Requisition Form; Hem- RQ19.Ver4.31 Aug 2021	-	Hematology Hospital Ampang
231	Molecular study for FIP111	Blood	EDTA tube	2.0 mL	8 weeks	Hospital Ampang Special Haematology Requisition Form; Hem- RQ19.Ver4.31 Aug 2021	-	Hematology Hospital Ampang
232	Molecular study for JAK2	Blood	EDTA tube	2.0 mL	8 weeks	Hospital Ampang Special Haematology Requisition Form; Hem- RQ19.Ver4.31 Aug 2021	-	Hematology Hospital Ampang
233	Molecular study for PML-RARA	Blood	EDTA tube	2.0 mL	8 weeks	Hospital Ampang Special Haematology Requisition Form; Hem- RQ19.Ver4.31 Aug 2021	-	Hematology Hospital Ampang

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCE D TO
234	Monkeypox qRT-PCR	<p>i) Lesion Fluid Swab</p> <p>ii) Lesion Fluid Aspirate</p> <p>iii) Lesion Roof</p> <p>iv) Scab/Crust</p> <p>v) Tonsillar Tissue Swab</p> <p>vi) Nasopharyngeal Swab</p>	<p>i) Lesion Fluid Swab : Sterile polyester or Dacron swab. Break off end of applicator into sterile container or place entire swab in a sterile container.</p> <p>ii) Lesion Fluid Aspirate: sterile container.</p> <p>iii) Lesion Roof : sterile container.</p> <p>iv) Scab/Crust : two scabs each from at least two body locations in separate sterile container.</p> <p>v) Tonsillar Tissue Swab :Sterile polyester or Dacron swab. Break off end of applicator into sterile container or place entire swab in a sterile container.</p> <p>vi) Nasopharyngeal Swab (2 SET) : Sterile polyester or Dacron Swab. Break off end of applicator into sterile container or place entire swab in a sterile container.</p>	<p>Lesion Fluid Aspirate : 1.5 - 2.0 mL DO NOT ADD ANY VIRAL TRANSPORT MEDIA Other specimens : Not applicable</p>	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
235	Mucopolysaccharides (GAGs)/HRE Glycosaminoglyc	First Morning Urine	Sterile container	5.0 mL	1 month	IMR-HEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
236	Mucopolysaccharides Enzyme Assays-Panel Test	Whole blood	EDTA tube	2.0 ml (3 tubes)	1 month	IMR-HEM REQUEST FORM Version 6	Do not spin, Do not FREEZE, send whole blood within 72 hours after collection. Option maximum up to 2 diseases of enzyme. Required urine GAGs screening status or after consultation by geneticist.	Chemical Pathology	Biochemistry Unit, IMR KL
237	Mumps IgG/IgM	Blood	Gel tube	3.0 - 5.0 mL	1 - 2 weeks	PER-PAT 301	EIA	Microbiology	Hosp Sg Buloh
238	Mumps PCR	i) Oral or buccal swab ii) Saliva	i) Sterile container with VTM ii) Sterile container	i) Sterile container with 2.0-2.5 ml of VTM ii) 3.0 - 5.0 mL	3 - 5 weeks	MKAK-BPU-U01	1. Sample should be collected within 5 days from onset of illness. 2. A brief concise history of illness and physical findings is required especially the date of onset of illness and date of sample collection. 3. After sample is collected, immediately send the sample to the laboratory. If there is any delay, keep the sample at 2 -8°C up to 48 hours. If exceeding 48 hours, the sample should be stored at -70°C.	Microbiology	MKAK Sg Buloh

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
239	Mycobacterium leprae PCR	Skin incision / Punch Biopsy	Sterile container	Minimum size of 4 mm x 12 mm (skin incision) or	2 weeks	PER-PAT 301	Sample in container without preservative should be transported to reach the laboratory at 2-8 °C within 5 days after collection.	Microbiology	MKAK Sg Buloh
240	Mycobacterium tuberculosis (MTB) Culture & Sensitivity	i) BAL, ii) sputum, iii) CSF, iv) sterile body fluids, v) tracheal aspirate, vi) pus aspirate, vii) tissue, viii) urine	Sterile container	3.0 - 5.0 mL	8 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
241	Mycobacterium tuberculosis (MTB) Culture & Sensitivity , blood	Blood	Fungal/MTB blood culture bottle	5.0 - 10.0 mL	42 days	PER-PAT 301	Please collect blood culture bottle from microbiology lab. Positive blood culture bottle will take additional incubation period of maximum 8 weeks.	Microbiology	Hospital Sultanah Bahiyah (HSB)
242	Mycobacterium tuberculosis (MTB) Culture & Sensitivity, bone marrow	Bone marrow	Fungal/MTB blood culture bottle	5.0 - 10.0 mL	42 days	PER-PAT 301	Please collect blood culture bottle from microbiology lab. Positive blood culture bottle will take additional incubation period of maximum 8 weeks.	Microbiology	Hospital Sultanah Bahiyah (HSB)
243	Mycobacterium tuberculosis (MTB) Line Probe Assay (LPA)	Sputum	Sterile container	5.0 mL	Postage weekly / arrangement if urgent	MKAK-BPU-U01	-	Microbiology	MKA Ipoh

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
244	Mycobacterium tuberculosis (MTB) PCR (Blood)	Blood	Plain tube (Red Cap)	3.0 - 5.0 mL	7 days	MKAK-BPU-U01	-	Microbiology	MKA Ipoh
245	Mycobacterium tuberculosis (MTB) PCR (other than blood)	Sputum, pus, tissue, stool, FPPE block, CSF & other body fluids	sterile container	For CSF 1.0 - 2.0 mLs	2 weeks	Tuberculosis Laboratory Request Form (IMR/IDRC/BACT/TB/01)	For CSF send to lab immediately; for sputum ideally collect 3 consecutive specimens. A single well collected specimen is adequate.	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
246	Mycoplasma pneumoniae IgG/IgM	Blood	Gel tube	3.0 - 5.0 mL	2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
247	Myoglobin & Hemoglobin, urine	Fresh Urine	Sterile container with preservative (sodium bicarbonate)	10.0 mL	2-3 weeks	PER-PAT 301	Inadequate specimen volume will be rejected. Please collect urine sample in container contains 200 mg of sodium bicarbonate (2% final concentration). Lab staff will ensure that pH>8 before sent to the referral laboratory.	Chemical Pathology	Hospital Ampang
248	Nipah Virus Antibody	Blood, CSF	Gel tube, Bijou	i) Blood : 1.0 - 3.0 mL ii) CSF: 1.0 - 3.0 mL	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	ELISA	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
249	Non Gynae for Cytology	Body fluids, sputum, urine, bronchoalveolar lavage etc	Sterile container	10.0 mL	Urgent : 1 week Routine : 3 weeks	PER-PAT 301	-	Microbiology	Cytopathology Unit, HSAH
250	Oligoclonal Band, CSF	1. CSF 2. Blood	1. Sterile container 2. Gel Tube	1. CSF : 1.0 mL 2. Blood : 3.5 mL	1 month	PER-PAT 301	CSF must be accompanied by patient's blood.	Chemical Pathology	Hospital Ampang
251	Oligosaccharide, urine	Random urine	Sterile container	5.0 mL	2 months	IMR-HEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
252	Organic Acids, Plasma (FORENSIC Only)	Blood	EDTA/Heparin tube	2.0 mL	10 days	IMR-HEM REQUEST FORM Version 6	By Consultation Only	Chemical Pathology	Biochemistry Unit, IMR KL
253	Organic Acids, urine	Random Urine	Sterile container	5.0 mL	1 week	IMR-HEM REQUEST FORM Version 6	Transport FROZEN. Organic acids easily destroyed by heat.	Chemical Pathology	Biochemistry Unit, IMR KL

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVAT	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
254	Organic Acids, Vitreous Humour (FORENSIC Only)	Vitreous Humour	Sterile container	2.0 mL	10 days	IMR-IEM REQUEST FORM Version 6	By Consultation Only	Chemical Pathology	Biochemistry Unit, IMR KL
255	Orotic Acid, urine	Random Urine	Sterile container	5.0 mL	1 month	IMR-IEM REQUEST FORM Version 6	Transport FROZEN. (Orrganic acid easily destroyed by heat)	Chemical Pathology	Biochemistry Unit, IMR KL
256	Osmolality, serum	Blood	Gel tube	3.5 mL	2 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg.Petani.
257	Osmolality, urine	Random Urine	Sterile container	5.0 - 10.0 mL	2 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg.Petani.
258	Osmotic fragility test	Blood	Lithium Heparin Tube	4.0 mL (2 tubes)	1 week	PER-PAT 301	Appointment must be made by the attending Doctor & must be Fresh sample	Hematology	Hospital Sultanah Bahiyah (HSB)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
259	Panel Anti - Ganglioside Antibodies: Anti-GM1, Anti-GM2, Anti-GM3, Anti-GM4, Anti-GD1a, Anti-GD1b, Anti-GD2, Anti-GD3, Anti-GT 1a, Anti-GT 1b, Anti-GQ1b), Serum	Blood	Gel tube	3.5 mL	3 weeks	IMR Autoimmune Request Form	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
260	Panel Coeliac Antibodies: Anti-Endomysium, Anti Gliadin, Anti Tissue Transglutaminase	Blood	Gel tube	3.5 mL	4 weeks	IMR Autoimmune Request Form	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
261	Panel cytokines (IL-6); IL-1 beta, IL-6,IL-8 & TNF-alpha (Applicable for government only)	Blood	Gel tube	3.5 mL	4 weeks	IMR Autoimmune Request Form	Please ensure only SERUM is sent to IMR in ice. To spin and put in plain tube (red cap) For appointment, please contact Dr Fatimah: 016-3807873	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
262	Panel Paraneoplastic Neurological Syndrome: Anti-Amphiphysin, Anti-Ma, Anti-Yo, Anti-Ri, Anti-Hu, Anti-CV2	Blood	Gel tube	3.5 mL	3 weeks	IMR Autoimmune Request Form	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
263	Panel Skin Antibodies: Anti-BP 180, Anti BP-230, Anti-Desmoglein 1 & Anti-Desmoglein 3	Blood	Gel tube	3.5 mL	3 weeks	IMR Autoimmune Request Form	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
264	Panel Specific Liver Antibodies : Anti-AMA-M2, M2-3E/ BPO,Sp.100,PmL, gp210,LKM1,LC- 1,SLA/LP,Ro-52	Blood	Gel tube	3.5 mL	3 weeks	IMR Autoimmune Request Form	Please enclose the screening test results along with this form (AMA, ASMA, LKM)	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
265	Pap Smear	Cervical Smear	Container with Preserve Cell Solution (liquid based preservative)	Not applicable	Urgent : 1 week Routine : 3 weeks	PER-PAT 301	-	Microbiology	Cytopathology Unit, HSAH
266	Parathyroid Hormone (PTH)	Blood	EDTA tube	2.0 mL	1 week	PER-PAT 301	Transported to the lab in ice bath.	Chemical Pathology	Hospital Pulau Pinang (HPP)
267	Parvovirus B19 IgG/IgM	Blood	Gel tube	3.0 - 5.0 mL	1 - 2 weeks	PER-PAT 301	EIA	Microbiology	Hosp Sg Buloh
268	Phenobarbitone	Blood	Plain tube (Red Cap)	3.0 mL	2 days	TDM REQUEST FORM	Inpatient/Urgent case: Samples should be sent to the laboratory 90 mins before outsourcing to other hospital. Outpatient : Sunday, Monday & Thursday	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg.Petani.

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
269	Phenytoin (Dilantin)	Blood	Plain tube (Red Cap)	3.0 mL	2 days	TDM REQUEST FORM	Inpatient/Urgent case: Samples should be sent to the laboratory 90 mins before outsourcing to other hospital. Outpatient : Sunday, Monday & Thursday	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg.Petani.
270	Phospholipase A ₂ Receptor antibody (Anti-PLA2R)	Blood	Gel tube	3.5 mL	4 weeks	IMR Autoimmune Request Form	-	Microbiology	Autoimmune Unit, IMR NIH Setia Alam
271	Pipercolic acid	Plasma	Heparin tube	3.5 mL	2 months	IMR-IEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
272	Platelet Immunology Tests	Blood	<ol style="list-style-type: none"> NAIT case : Mother sample (10.0 mL EDTA & 10.0 mL plain tube without gel) ; Father sample (10.0 mL EDTA) Baby sample (1.0 mL EDTA) ITP case : 10-20mL EDTA and 10mL plain tube without gel. Other case : 10mL EDTA & 10mL plain tube without gel 	Refer to information provided in Container/Preservative section for specific clinical case (NAIT/ITP/Other)	28 days	PDN/IH/QP-05/02 ver01 & PER-PAT 301	By appointment Sample can only be sent after approval by Pusat Darah Negara (PDN). To collect PDN/IH/QP-05/02 ver01 form from Transfusion Laboratory and to submit with PER-PAT 301 form. Specimen need to be sent to transfusion laboratory before 12 noon	Transfusion	Pusat Darah Negara (PDN)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
273	Polio Virus and Non Polio Virus	i) Stool(preferred)* (to collect within 14 days of onset, 2 adequate sample to collect in 24-48hrs apart) ii)Rectal swab, iii)Throat swab, iv) CSF	i)Stool: Sterile container ii) Rectal swab / Throat Swab : Sterile plastic vial contain 2.0 - 3.0 mL of VTM, iii) CSF: sterile container	i) Stool: >5gm (thumb size), ii) Rectal swab: Stool on sterile swab moistened with distilled water iii) TS: NA iv) CSF: 0.5 mL	3 - 5 weeks	Acute Flaccid Paralysis Case Investigation Form	All specimens for age < 15 years old only. N.B. Test requests for age >15 years old require consultation.	Microbiology	Virology Unit, IMR, NIH Setia Alam
274	Porphyria Profile: Porphobilinogen (Qualitative)	Random Urine	Sterile container	5.0 mL	1 month	IMR- IEM REQUEST FORM Version 6	Protect from light. Porphyrin easily destroyed by light	Chemical Pathology	Biochemistry Unit, IMR KL
275	Progesterone	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
276	Prolactin	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
277	Prostate Specific Antigen (PSA), Total	Blood	Gel tube	3.5 mL	7 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg.Petani.

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVAT	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
278	Protein C, Protein S, Anti thrombin	Blood	Sodium Citrate Tube	1.8 mL (3 tubes)	6 weeks	PER-PAT 301	-	Hematology	Hospital Tuanku Azizah (HTA), KL
279	Protein Electrophoresis, serum	Blood	Gel tube	3.5 mL	1 month	PER-PAT 301	Please contact Chemical Pathologist (3189) if the test need to be repeated <45days. MANDATORY authorisation by Specialist is required	Chemical Pathology	Hospital Pulau Pinang (HPP)
280	Pterins, CSF	CSF	Special Microtube with preservativ e (DTE & EDTA) - provided by IMR	1.0 mL	2 months	IMR-IEM REQUEST FORM Version 6	Kindly consult lab prior to sample collection. Protect from light, Transport FROZEN. (Pterins easily destroyed by heat and light)	Chemical Pathology	Biochemistry Unit, IMR KL
281	Pterins, urine	Random Urine	Sterile container	2.0 mL	2 months	IMR-IEM REQUEST FORM Version 6	Kindly consult lab prior to sample collection. Protect from light, Transport FROZEN. (Pterins easily destroyed by heat and light)	Chemical Pathology	Biochemistry Unit, IMR KL

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
282	Purine & Pyrimidine	Random Urine	Sterile container	5.0 mL	14 working days	HTA-IEM REQUEST FORM (HTA/PATH.GEN/03-2021)	Freeze immediately prior transporting to lab.	Chemical Pathology	Hospital Tuanku Azizah (HTA), KL
283	Qiasat Meningitis/ Encephalitis Panel (Rapid RT-PCR CSF Meningitis)	CSF	Bijou Bottle	0.5 - 1.0 mL	2 days	PER-PAT 301	i. Please discuss case with Microbiologist first ii. Temperature 15-25 degree celcius iii. To send within 12 hours from time of sampling iv. Blood stain unacceptable.	Microbiology	Hospital Sultanah Bahiyah (HSB)
284	Rabies Virus PCR	After consultation only	After consultation only	After consultation only	After consultation only	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
285	Real time PCR/ RT-PCR for single target virus	After consultation only	After consultation only	After consultation only	After consultation only	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
286 Respiratory Virus Antigen Identification (Influenza A, B; Parainfluenza 1,2,3; Adenovirus; RSV and Metapneumo virus)	i) Nasopharyngeal aspiration, ii) Nasopharyngeal swab / Throat swab / Nasal swab , iii) Throat gargle, iv) BAL , v) Sputum	i) NPA: Mucous secretion in VTM ii) NPS / TS / NS : put in vial contain 1.0 - 2.0 mL of VTM . Use different swab for each nostrils iii) Throat gargle / BAL / Sputum : Sterile container	i) NPA / Throat gargle / BAL / Sputum : as much as possible ii) NPS / TS / NS : Not applicable	1-2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam
287 Respiratory Virus Isolation and Identification (Influenza Virus A and B, Adenovirus, Respiratory Syncytial Virus, Parainfluenza Virus 1, 2 and 3, Human Metapneumovirus)	i) Nasopharyngeal aspiration, ii) Nasopharyngeal swab / Throat swab / Nasal swab , iii) Throat gargle, iv) BAL , v) Sputum vi) Organ biopsies	i) NPA: Mucous secretion in VTM ii) NPS / TS / NS : put in vial contain 1.0 - 2.0 mL of VTM . Use different swab for each nostrils iii) Throat gargle / BAL / Sputum : Sterile container iv) Biopsy: about 1.5cm cube of various parts of affected organs	i) NPA / Throat gargle / BAL / Sputum : as much as possible ii) NPS / TS / NS : Not applicable iii) Biopsy: Sterile containers containing VTM to keep tissue moist	14 - 28 days	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	-	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
288	Rickettsial Indirect Immunoperoxidase (IIP)	Blood	Gel tube	3.0 mL	2 weeks		-	Microbiology	Hospital Raja Permaisuri Bainun (HRPB), Ipoh
289	Rickettsial PCR	i) Blood ii) Tissue biopsies	i) EDTA tube ii) Sterile container	i) 2.0 mL (2 tubes) ii) NA	2 weeks	Rickettsiosis Laboratory Request Form (IMR/BACT/FORMS/RICK/O2)	i) For ICU cases & after consultation only ii) For better sensitivity, blood samplings should be repeated 2 or 3 times, at 3-4 hours interval and before antibiotics introduction. iii) Transportation at ambient temperature. If delayed keep at 2-8°C iv) Please fill up IMR Rickettsiosis Laboratory Request Form IMR/BACT/FORMS/RICK/O2	Microbiology	Bacteriology Unit, IMR NIH Setia Alam
290	Rubella Serology IgG/IgM	Blood	Gel tube	3.0 - 5.0 mL	1 week	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
291	S- Sulphocysteine, urine	Random Urine	Sterile container	2.0 mL	1 month	IMR-IEM REQUEST FORM Version 6	Collect WITHOUT preservative	Chemical Pathology	Biochemistry Unit, IMR KL

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
292 Sars-CoV-2 Viral isolation (Please tick in form: Viral Isolation Novel Coronavirus)	i) Nasopharyngeal swab, ii) Throat swab, iii) Nasal swab, iv) Organ biopsies	i) NPS: Use different swab for each nostrils. Put in vial contain 2.0 - 3.0 mL of VTM ii) TS: Sterile swab iii) Nasal swab: Use different swabs for each nostrils iv) Biopsy: remove portions, about 1.5cm cube of various parts of affected organs	i) NPS / TS / NS :NA ii) Biopsy: Sterile containers containing VTM to keep tissue moist	2 - 3 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	Active by consultation only, Please call	Microbiology	Virology Unit, IMR, NIH Setia Alam
293 Schistosomiasis serology	Blood	Gel tube/EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	EIA. Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
294 Serum Erythropoietin	Blood	Gel Tube	3.5 mL (2 tubes)	4-6 weeks	Hospital Ampang Special Haematology Requisition Form; Hem-RQ19.Ver4.31 Aug 2021	-	Hematology	Hospital Ampang
295 Severe Fever with Thrombocytopenia syndrome (SFTS)	After consultation only	After consultation only	After consultation only	After consultation only	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
296	Sex Hormone Binding Globulin (SHBG)	Blood	Gel tube	3.5 mL	20 days	PER-PAT 301	-	Chemical Pathology	Hospital Putrajaya (HPJ)
297	Sialic Acid (Total and Free), urine	First Morning Urine	Sterile container	5.0 mL	1 month	IMR-LEM REQUEST FORM Version 6	Freeze immediately. Transport frozen.	Chemical Pathology	Biochemistry Unit, IMR KL
298	Sirolimus	Blood	EDTA Tube	2.0 mL	1 week	TDM REQUEST FORM	Please contact TDM Pharmacy for any request. Please send samples to TDM Pharmacy on Sunday during office hours.	Chemical Pathology	Hospital Tuanku Azizah (HTA), KL
299	St. Louis Encephalitis (SLEV) PCR	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
300	Stool for Cryptosporidium spp., Cyclospora spp. and Isospora spp. (DMSO stain) and Microsporidium spp. (Gram Chromotrope stain)	Fresh Stool	Sterile container	3.0 mL	2 - 3 weeks	PER-PAT 301	Fresh stool in plain container (specimen to reach lab within 24hr at room temperature) (Before REFERRAL, initial ID parasite to determine by customer)	Microbiology	Parasitology Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
301	Streptococcus pneumoniae antigen	i) Urine ii) CSF	i) Sterile container ii) Bijou bottle	NA	1 week	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
302	Succinylacetone, urine	Random Urine	Sterile container	5.0 mL	1 month	IMR-HEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
303	Sugar & Polyols, urine	Random Urine	Sterile container	5.0 mL	1 month	IMR-HEM REQUEST FORM Version 6	-	Chemical Pathology	Biochemistry Unit, IMR KL
304	Tacrolimus	Blood	EDTA Tube	2.0 mL	1 week	TDM REQUEST FORM	The last sample must be sent to the laboratory before 8.30am; (1hour before) outsourcing to referral hospital at 9.30am. Please send the TDM samples to TDM Pharmacy on Sunday (office hour only)	Chemical Pathology	Hospital Pulau Pinang (HPP)
305	Taeniasis/ Cysticercosis serology	Blood	Gel tube/EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	EIA. Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT IN CHARGE	OUTSOURCED TO
306	Testosterone	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
307	Theophylline/ Aminophylline	Blood	Plain tube (Red Cap)	3.5 mL	2 working days	TDM REQUEST FORM	Inpatient/Urgent case: Samples should be sent to the laboratory 90 mins before outsourcing to other hospital. Outpatient :	Chemical Pathology	Hospital Sultanah Bahiyah (HSB)
308	Thyroglobulin	Blood	Gel tube	3.5 mL	2 weeks	PER-PAT 301	-	Chemical Pathology	Hospital Pulau Pinang (HPP)
309	Tissue auto antibodies (TA) -Anti-smooth muscle antibody (ASMA) -Anti-mitochondrial antibody (AMA) -Anti-liver kidney microsomal antibody (LKM)	Blood	Gel tube	3.5 mL	2 - 3 weeks	PER-PAT 301	-	Microbiology	Hospital TuanKu Fauziah, Kangar, Perlis
310	TORCHES (Rubella, Toxoplasma, CMV, Herpes) IgG/IgM	Blood	Gel tube	3.0 - 5.0 mL (4 tubes)	1 week	PER-PAT 301	To request each tests separately	Microbiology	Hospital Sultanah Bahiyah (HSB)

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
311	Toxicology Test, urine	Urine	Sterile container	25.0 mL	6 months	Borang Permohonan Bagi Pemeriksaan Forensik/ Toksikologi	-	Chemical Pathology	Jabatan Kimia Pulau Pinang
312	Toxicology Test, blood	Blood	Sodium Fluoride tube	2.0 mL (5 tubes)	6 months	Borang Permohonan Bagi Pemeriksaan Forensik/ Toksikologi	-	Chemical Pathology	Jabatan Kimia Pulau Pinang
313	Toxocariasis Serology	Blood	Gel tube/EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
314	Toxoplasma gondii IgG/IgM	Blood	Gel tube	3.0 - 5.0 mL	1-2 weeks	PER-PAT 301	-	Microbiology	Hospital Sultanah Bahiyah (HSB)
315	Toxoplasmosis Serology and Confirmatory	Blood	Gel tube/EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	-	Microbiology	Parasitology Unit, IMR NIH Setia Alam
316	Trace Element, Blood	Blood	Sodium Fluoride tube	2.0 mL (5 tubes)	6 months	Borang Permohonan Bagi Pemeriksaan Forensik/ Toksikologi (Kimia 15- Pin.1/2004)	-	Chemical Pathology	Jabatan Kimia Pulau Pinang

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
317	Trichinellosis serology	Blood	Gel tube/EDTA	2.0 mL	1 - 2 weeks	PER-PAT 301	EIA. Send sample in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
318	Triiodothyronine (FT3/FT3), Free	Blood	Gel tube	Adult: 3.5 mL Paeds: 1.0 mL	7 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg.Petani.
319	Trypanosomiasis Microscopy	Blood, Thick blood film, Lymph node film	EDTA tube, slide mailer or sterile container	2.5 mL	1 - 2 weeks	PER-PAT 301	Send Cerebrospinal fluid within 24 hours in ice	Microbiology	Parasitology Unit, IMR NIH Setia Alam
320	Tryptase	Blood	Gel tube	3.0 mL	2 weeks	IMR Allergy Request Form (IMR/AIRC/Allergy/RF)	Timing of samples collection 1) 1st sample within 15 minutes up to 3 hours after the onset of the symptoms 2) 2nd sample after 24-48 hours to confirm the return to baseline levels 3) 3rd sample after 1-2 weeks if incidents of mastocytosis or other causes of elevated basal levels are suspected 4) Sample required other than anaphylaxis, as per clinician's request/ indication	Microbiology	Allergy Unit, IMR NIH Setia Alam

TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
321 Valproic Acid (Epilim)	Blood	Plain tube (Red Cap)	3.0 mL	2 days	TDM REQUEST FORM	Inpatient/Urgent case: Samples should be sent to the laboratory 90 mins before outsourcing to other hospital.	Chemical Pathology	Hospital Sultan Abdul Halim (HSAH), Sg.Petani.
322 Varicella Zoster IgG/IgM	Blood	Gel tube	3.0 - 5.0 mL	1 - 2 weeks	PER-PAT 301	EIA	Microbiology	Hosp Sg Buloh
323 Varicella Zoster PCR	Blood, CSF	EDTA, Sterile bijoux bottle	5.0 mL	1 - 2 weeks	PER-PAT 301	-	Microbiology	Hosp Sg Buloh
324 VDRL, CSF	CSF	Bijou bottle	1.0 - 3.0 mL	1 weeks	PER-PAT 301	Test offered for patients with positive RPR/ TPPA test.	Microbiology	Hospital Sultanah Bahiyah (HSB)
325 Vitamin B1 (Thiamine)	Blood	EDTA Tube	2.0 mL	20 working days	BORANG PERMOHONAN UJIAN MAKMAL (SPESIMEN KLINIKAL) MKKAK MKKAK-BPU-U01/ Rev2018	Please wrap the EDTA tube with aluminium foil. Samples >24hours should be frozen condition until reach to the referral lab. MANDATORY authorization by Specialist is required & stated the requestor phone number.	Chemical Pathology	MKKAK Sg. Buloh

	TESTS	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LTAT	TYPES OF FORM	COMMENT	UNIT INCHARGE	OUTSOURCED TO
326	Vitamin B12	Blood	Gel tube	3.5 mL	5 working days	PER-PAT 301	-	Chemical Pathology	Hospital Sutanah Bahiyah (HSB)
327	Vitamin D, Total (25-Hydroxy)	Blood	Gel tube	3.5 mL	14 working days	PER-PAT 301	MANDATORY authorization by Specialist is required	Chemical Pathology	Hospital Putrajaya (HPJ)
328	Von Willebrand Antigen and activity	Blood	Sodium Citrate Tube	1.8 mL (3 tubes)	1 month	PER-PAT 301	-	Hematology	Hospital Tuanku Azizah (HTA), KL
329	West Nile Virus PCR	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
330	Yellow Fever PCR	After consultation only	After consultation only	After consultation only	1 - 2 weeks	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam
331	Zika Virus PCR	After consultation only	After consultation only	After consultation only	After consultation only	Virology Test Request Form (IMR/IDRC/VIRO/ADMIN/53)	After consultation only	Microbiology	Virology Unit, IMR, NIH Setia Alam

UNIT SPECIFIC GUIDELINES



HEMATOLOGY UNIT

1.0 SAMPLE COLLECTION FOR COAGULATION TESTING

- 1.1 Before sample collection ensure that the patient is not on any anticoagulants; if on, please state the type of anticoagulant therapy, dose and time of ingestion/administration in relation to sampling on the request form.
- 1.2 Venous blood is drawn into a 3.2% buffered sodium tube (blue top tube), yielding a whole blood sample with a 9:1 blood to anticoagulant ratio; please ensure that the blood sample is collected up to the indicated mark on the sodium citrate tube (Inadequate filling of the collection tube will affect this ratio, and may result in erroneous test results)
- 1.3 **When drawing the specimen:**
 - 1.3.1 Venepuncture must be clean with no trauma and the application of the tourniquet should be limited to 1 minute.
 - 1.3.2 If possible sample should be collected from a large vein (preferably the vein at the bend of the elbow) using a 21 gauge needle for adults and 22 or 23 gauge for infant.
 - 1.3.3 Avoid blood collection for coagulation testing from an indwelling catheter. However, if a blood specimen for coagulation testing must be collected from an indwelling line that may contain heparin, the line should be flushed with 5 mL of saline and the first 5 mL of

blood or 6-times the line volume (dead space volume of the catheter) be drawn off and discarded before the coagulation tube is filled.

- 1.4 If multiple blood test are carried out for a patient, a blue top tube used for coagulation testing should be filled before any other tubes containing additives. This includes tubes containing other anticoagulants and/or plastic serum tubes containing clot activators. A serum tube that does not contain an additive can be collected before the blue top tube.
- 1.5 If a patient has a haematocrit > 55%, need to collect sample in coagulation tube with adjusted citrate volume. Please call ext. 3184 for a new citrate tube
- 1.6 Mix gently by inverting the tube end over end 5 to 6 times. Avoid vigorous mixing or additional inversion. Observe for the presence of clots. Specimens containing fibrin clots will, in most cases, be rejected.
- 1.7 Transport the sample **IMMEDIATELY** at ambient temperature to the lab and maintain at ambient temperature until processed.
- 1.8 Sample processing ideally should take place within 1 hour of collection; however it must be completed within 4 hours of collection.

2.0 SPECIMEN HANDLING

Coagulation tests are extremely sensitive to methods of collection and preservation. It is important that sample collection and processing instructions be followed to ensure accurate test results.

3.0 SPECIMEN STORAGE

Specimens are stored under appropriate storage conditions that permit reliable retrieval in each unit.

4.0 COAGULATION SPECIMEN REJECTION CRITERIA

4.1 Insufficient specimen volume (under fill or overfill)

Citrate tubes - less or more than 10% of stated tube volume (up to the mark)

4.2 Lipaemic Samples

Grossly lipaemic samples giving inaccurate results even after plasma replacement should be recollected.

4.3 Delayed sample received for haemostasis test (PT and APTT shall be tested within 4 hours from time of specimen collection).

TYPES OF SPECIMEN CONTAINERS

Images of tube	Test	Anti-coagulant	Tube Type	Volume	Number of mixing by inversion
	FBC, FBP, Hb analysis, reticulocyte count, Kleiuiheur test	Adult: EDTA	Adult: Vacuum	2.0 ml	8-10 times
		Paediatric: EDTA	Paediatric: Non vacuum	0.5 ml	8-10 times
	PT, APTT, INR, D dimer, fibrinogen, mixing test	Adult: Sodium Citrate	Adult : Vacuum	1.8 ml	3-4 times
		Paediatric: Sodium Citrate	Paediatric: Non vacuum	1.0 ml	3-4 times
	ESR	Westergran Tube (Sodium Citrate)	Vacuum	1.2-1.4mls	8-10 times




TRANSFUSION UNIT

1.0 INTRODUCTION

- 1.1 All request must be accompanied by appropriate form and legible hand writing
- 1.2 Please inform Transfusion Laboratory Staff and medical officer via telephone for emergency case requires urgent blood supply
- 1.3 Option available : safe O (uncross-matched O Rh D positive)/ uncross-matched group scientific/ Emergency (Saline Phase) cross match
- 1.4 All request for emergency blood supply must be accompanied with 5ml blood sample in EDTA tube (including Safe O)

All Blood & Blood products must be transfused immediately. If not, please return to Transfusion Laboratory as soon as possible.

TYPES OF SPECIMEN CONTAINERS

Images of tube	Test	Anti-coagulant	Tube Type	Volume	Number of mixing by inversion
	ABO Blood Grouping, GSH, GXM	Adult: EDTA	Adult: Vacuum	6.0 ml	8-10 times
		Paediatric: EDTA	Paediatric: Non vacuum	0.5 ml	8-10 times
	Coomb's Test	Adult: EDTA	Vacuum	2.0 ml	8-10 times

CHEMICAL PATHOLOGY UNIT

1.0 INTRODUCTION

The chemical pathology is a unit in Pathology and Transfusion Department. Its services cover pre-analysis, analysis and interpretation of biochemical changes in serum/plasma and body fluids for diagnostic, monitoring and screening of diseases.

2.0 SERVICES

Sample will be received at Chemical Pathology Counter Unit via porter during office hours (Sunday-Thursday) and after office hours, the sample must be sent to the Main Counter. These samples will be sorted based on tests requested and processed accordingly. The diagnostic services provided covers both urgent and routine request:

2.1 Definition:

- 2.1.1 Urgent Test - These are short turnaround time tests which are required for immediate patient management as indicated by the clinician in the request form. Service provided 24hours.
- 2.1.2 Routine Test – These include all the tests that offered during office hours.

3.0 REQUEST OF TESTS

- 3.1 All chemical pathology tests can be requested by the clinician using standard request form (PER PAT 301) and specimens send to referral laboratories.
- 3.2 All request forms must be completely filled in especially patient's biodata, patient's clinical history, provisional diagnosis, tests requests and time & date of specimen taken. It must be accompanied by properly collected specimens.
- 3.2 All request form must be signed by H.O, M.O or specialist. Name of requesting Doctor must be clearly written and cop

4.0 SAMPLE COLLECTION

For special test which are not mentioned, please call the laboratory for specimen instructions or requirements.

- 4.1 Most Chemical Pathology tests are performed using serum and plasma heparin samples. A type of specimen for each test is listed for reference. Proper collection is essential to provide accurate results for patient management and care. The quality of specimen provided will determine the quality, reliability and accuracy of the laboratory result.
- 4.2 For collection of specimen for clinical chemistry analysis, minimum tourniquet pressure should be applied during venipuncture in order to avoid forcing of free fluid from capillaries which may result in hemoconcentration and spurious elevations of protein and protein bound substance e.g. total protein, calcium. If possible, tourniquet should be released after no more than 1 minute from the initial placement.
- 4.3 Hemolysis can affect clinical chemistry test by interfering with the photometric determination of the analyte concentration in the sample leading to erroneous results. If considerable hemolysis is noted, another sample will be requested upon rejection of the first sample.
- 4.4 Avoid mixing or transferring blood from different tubes as certain tubes may contain anticoagulant substance which will falsely elevated the concentration of certain analyte in the sample. Avoid collection of blood from limbs being infused with intravenous solution. This will lead to hemodilution and measurements on these sample produces erroneous results which is not the actual presentation of the analyte concentration in the specimen.

5.0 SPECIAL TEST INSTRUCTION AND COLLECTION PROCEDURE

5.1 Arterial Blood Gases

5.1.1 Procedure of collection

- i. Use a 1 ml disposable heparinized syringe.
- ii. Draw 1 ml of arterial blood. Invert the syringe and remove all air bubbles inside the syringe. Discard the needle to prevent needle stick injury incidence and recap with special stopper provided to avoid specimen exposure to air.
- iii. Mix well by rolling the syringe between palms to prevent clotting.
- iv. Put syringe of blood in slurry ice bath and send immediately to the lab.

5.1.2 Important notes

- i. After the blood is drawn into the syringe, any air space or bubbles must be removed.
- ii. The specimen must be kept embedded in crushed ice and sent immediately for analysis (within 30 min). Specimen exceeding this time frame may be rejected.
- iii. Laboratory which has been placed blood gas analyzer does not need to send sample to the laboratory. Except the analyzer system is down.

5.2 24-Hours Urine Collection

5.2.1 Procedure of collection

- i. The 24 hour urine bottle is available at Main Counter in Pathology Department.
- ii. On the day of collection, the first urine voided must be discarded.
- iii. Time of first urine voided is the start of the timing for the 24 hour collection.
- iv. At the end of 24 hour, the last urine voided is collected. For best result, refrigerate sample if possible.
- v. Send the urine sample immediately to the laboratory.

5.2.2 Important notes

Some 24 hour urine container contain preservatives. Do not discard the preservative.

5.3 Lactate

Collection of satisfactory specimen for lactate analysis requires special procedure to prevent changes in lactate concentration while and after the specimen is drawn.

5.3.1 Procedure of collection

- i. Patient should be fasting and at complete rest.
- ii. A venous specimen is best drawn without a tourniquet or immediately after the tourniquet has been applied briefly.
- iii. If the tourniquet has been applied very long, it should be removed after the puncture has been performed and blood allowed circulating for at least 2 minutes before the blood is withdrawn.
- iv. 2 ml of blood is collected in a container with sodium fluoride as anticoagulant.

5.3.2 Important notes Sample should be chilled in the ice bath and sent to the laboratory within 1 hour. Separation of cell through centrifugation at the laboratory is done within 30 minutes. Haemolysed specimen may affect the results.

5.4 Ammonia

Collection of a satisfactory specimen for ammonia analysis requires special procedure to prevent changes in ammonia concentration during and after the-sample is drawn.

5.4.1 Procedure of collection

- i. A venous specimen is best drawn without a tourniquet or immediately after the tourniquet has been applied briefly.

- ii. If the tourniquet has been applied for a prolonged time, it should be removed after the puncture has been performed and blood allowed circulating for at least 2 minutes before the blood is withdrawn.
- iii. 2 mL blood in EDTA tube on ice. Send to laboratory on ice within 15 minutes of collection. For pediatric patients a minimum of 1 mL blood (full micro tube) is required.

5.4.2 Important notes

- i. This test must be processed urgently.
- ii. Make a call to set an appointment before the sample is drawn.
- iii. Notify the Laboratory that the specimen is on its way.
- iv. Ammonia levels may be elevated due to pre-analytical sources. -These include: Poor collection technique. Hemolysed specimens and prolonged storage (even once frozen) will result in elevated levels making interpretation difficult.

5.5 HbA1c

5.5.1 Procedure of collection

2 ml of blood is collected in a container with EDTA as anticoagulant.

5.5.2 Important notes

- i. Test should be performed for monitoring of patients diagnosed with diabetes mellitus.
- ii. Repeated testing should be done only on a two monthly basis or longer as the HbA1c measurement is dependent on the life span of red cells in circulation
- iii. Several condition may affect the HbA1c result (hemolytic anemia, iron deficiency anemia, end stage renal failure and hemoglobinopathies) leading to possible misinterpretation of the result. In this condition, blood glucose monitoring or fructosamine is preferable.

5.6 Creatinine Clearance Test

5.6.1 Procedure of collection

- i. A 24 hour period of urine collection is recommended.
- ii. A careful and accurate 24 hour collection of urine must be ensured.
- iii. At the same time during the day, a blood sample is taken for serum creatinine analysis. Both blood and 24 hour urine sample are sent to the laboratory.

5.7 Glucose Tolerance Test

5.7.1 Procedure of collection

- i. Fast the patient overnight.
- ii. Collect fasting blood specimen.
- iii. Begin collection (8.00a.m). Give patient 75g glucose in 250 –300 ml water and drink within 5 minutes. For children weighing less than 43 kg should take 1.75g/kg body weight.
- iv. After 2 hours (10.00a.m). Collect a 2nd blood specimen after exactly two hours of glucose consumption.

5.7.2 Important notes

- i. GTT is a test to determine the body's ability to handle glucose. It may be used for screening and diagnosis of diabetes, pre-diabetes and gestational diabetes.
- ii. For three days prior to the test, the patient must be on a diet containing no less than 200 g of carbohydrate daily.
- iii. The patient must rest for 30 minutes before and also during the test and smoking is not allowed.
- iv. Do not perform this test when patient acutely unwell.
- v. The glucose solution for this test should be obtained from the pharmacy.






6.0 OUTSOURCE TESTS

Tests which are not provided in house will be outsourced to other hospital and referral labs for analysis. The specimens are sent to the referral laboratories (refer to a schedule below).

TYPES OF SPECIMEN CONTAINERS

Images of tube	Test	Anti-coagulant	Tube Type	Volume	Number of inversion
	RP,BUSE,LFT, FLP, SBV, CE, Calcium, Magnesium, Phosphate, Amylase, Iron/ Transferrin	Adult: Lithium Heparin	Adult: Vacuum	3.5 ml	5 times
		Pediatric: Lithium Heparin	Pediatric: Non vacuum	800 ul	5 times
	TSH, FT4, Ferritin, CRP, B-hCG	Plain tube with gel and clot activator for serum separation	Adult : Vacuum	3.5 ml	5 times
		Plain tube with gel and clot activator for serum separation	Pediatric: Non vacuum	500 ul	5 times
	Glucose, Lactate	Sodium Fluoride or Potassium Oxalate	Vacuum	2.0 ml	8 times

TYPES OF SPECIMEN CONTAINERS

Images of tube	Test	Anti-coagulant	Tube Type	Volume	Number of inversion
	Blood Gas	Heparin	Syringe	0.6 ml-1.0 ml	Mixed well using roller mixer or palm. Send ASAP to lab with ice.
	HbA1c, Ammonia	K ₂ EDTA Tube	Vacuum	2.0 ml	8 times
	24 Hours Urine Chemistry	24 hours urine container without preservative	Container	24 hours collection	NA
	CSF Biochemistry	Sterile Bijou Bottle	Sterile Container	1-3ml (as collected)	NA
	Urine FEME/ Fecal Occult Blood	Urine Container	Sterile Container	Urine : >5ml	NA

MICROBIOLOGY UNIT

1.0 INTRODUCTION

- 1.1 All tests must be order by attending house officer, medical officer or clinical specialist
- 1.2 All request form must be complete (identifiers, location, date, signed and cop of requester, sufficient clinical history)
- 1.3 Test order must be precise
- 1.4 All specimen must be labeled (Identifier, test, type of specimen and location)
- 1.5 Put specimen which has been taken inside the transport media into a biohazard plastic
- 1.6 For high risk sample eg- respiratory sample for AFB direct smear, plastic MUST BE DOUBLE
- 1.7 One specimen 1 form, where all specimens must be individually packed.
- 1.8 Ensure dispatch book is brought along the specimen to the pathology count
- 1.9 For special test, PCR and other molecular test for infectious disease must be countersigned or order by specialist.





TYPES OF SPECIMEN CONTAINERS

Container Picture	Specimen	Container	Test	Volume	Comment
 <p>BIJOU BOTTLE</p>	CSF	Bijou bottle	CSF C&S, CSF Gram stain, Latex agglutination, Indian Ink, CSF for PCR (HSV PCR, JE PCR, etc)	2 mls, Please send most turbid sample for C&S	Please request this type of bottle from Microbiology Unit staff. Few tests can be combined in 1 sample, please communicate with staff.
 <p>AEROBIC BLOOD CULTURE BOTTLE (ADULT)</p>	Blood, bone marrow aspirates, sterile fluids	Blood culture bottle: Aerobe (BLUE CAP)	Blood C&S	Adult: 8-10 mls	DO NOT put the sticker onto the barcode area on the bottle
 <p>ANAEROBIC BLOOD CULTURE BOTTLE (ADULT)</p>	Blood for anaerobic bacteria culture	Blood culture bottle: Anaerobe (GOLD CAP)	Blood C&S	Adult: 8-10 mls	DO NOT put the sticker onto the barcode area on the bottle. Please request from Microbiology Lab
 <p>PAEDS BLOOD CULTURE BOTTLE</p>	Blood for paediatric patient	Blood culture bottle: Paeds (SILVER CAP)	Blood C&S	Peds: 1 - 3 mls	DO NOT put the sticker onto the barcode area on the bottle




TYPES OF SPECIMEN CONTAINERS

Container Picture	Specimen	Container	Test	Volume	Comment
 MYCO-F LYTIC BLOOD CULTURE BOTTLE	Blood	Myc F Lytic (RED CAP)	For isolation of Mycobacterium (TB) and fungal culture	Optimal 3-5 mls	DO NOT put the sticker onto the barcode area on the bottle. Please request from Microbiology Lab
 MICROTAINER	Blood (to centrifuge to obtain serum)	Plain Micro gel tube or Micro EDTA tube	Most serology, immunology, PCR tests for baby	0.5 mls	Lysed blood will be rejected
 EDTA TUBE	Blood	EDTA tube	Most PCR test	Adult : 5 mls	please confirm specific test requirement with Serology Unit staff
 PLAIN GEL TUBE	Blood (to centrifuge to obtain serum)	Plain gel tube	Most serology and immunology tests	3-5 mls	Lysed blood will be rejected


TYPES OF SPECIMEN CONTAINERS

Container Picture	Specimen	Container	Test	Vol	Comment
 <p>STERILE BORIC ACID CONTAINER</p>	Urine	Sterile container with boric acid	Urine C&S	15-20 mls	Please put sample not less than 15 mls and not more than 20 mls to avoid false negative or overgrowth.
 <p>SWAB WITH AMIES</p>	All other swabs except endocervical swab and rectal swab	Swab with Amies Transport Medium	HVS, pus swab, tissue swab and throat swab and other swabs C&S		Swab samples subject to growth with mixed organisms. Tissue is preferable.
 <p>SWAB WITH CHARCOAL</p>	Endocervical swab	Swab with Amies Transport Medium (with charcoal)	Culture & sensitivity for Gonococcal (GC)		Please mention Endocervical swab for GC C&S in request form. HVS sample will be rejected
 <p>SWAB WITH CARY BLAIR</p>	Rectal swab	Swab with Cary Blair Medium	Rectal Swab C&S, Stool C&S, Screening of CRE		

TYPES OF SPECIMEN CONTAINERS

Container Picture	Specimen	Container	Test	Volume	Comment
 <p>FLOCKED SWAB WITH STERILE CONTAINER</p>	Swab from vesicular lesion, eye, respiratory (throat/ nasal/ nasopharynx)	Swab/ Flocked swab in sterile container (tube type container or falcon tube)	Rapid antigen test such as Rapid Respiratory Virus Panel Test, Covid-19 Antigen Test, etc	Transfer in ice box	Send immediately to laboratory. Packaging depend on types of organism suspected (double packaging or triple packaging)
 <p>FLOCKED SWAB WITH VTM</p>	Swab from vesicular lesion, eye, respiratory (throat/ nasal/ nasopharynx)	Swab/ Flocked Swab with Viral transport medium (VTM)	Viral isolation, PCR	Insert swab/ flocked swab into VTM and transfer in ice box	Packaging depend on types of organism suspected (double packaging or triple packaging)
 <p>TRACHEAL ASPIRATE CONTAINER</p>	Tracheal aspirate	Tracheal aspirate container	Tracheal aspirate C&S, Tracheal aspirate for viral isolation / PCR (Eg : MERS-COV)		Please discuss with Pathology specialist for tests other than C&S

TYPES OF SPECIMEN CONTAINERS

Container Picture	Specimen	Container	Test	Vol	Comment
 CONTAINER	Urine, sterile fluid, tissue, sputum, pus aspirate, stool	Universal Sterile container	Urine C&S (Baby), Body Fluids C&S, Tissue C&S, Sputum C&S, Pus Asp. C&S, Tissue/Fluid for PCR/Viral culture, Sputum MTB C&S, Sputum AFB Screening, Stool C&S, Stool Ova&Cyst, etc.	NA	DO NOT add formalin for tissue culture. For molecular test (PCR/Viral culture), to send with ice pack

HISTOPATHOLOGY AND CYTOPATHOLOGY SECTION

1.0 INTRODUCTION

Anatomic Pathology includes Histopathology and Cytology examination from tissue or body fluid sample. This section will receive, pack and send the specimens to Histopathology Laboratory of Hospital Sultan Abdul Halim, Sungai Petani from Sunday to Thursday. Specimens require examination by Immunofluorescence (IF) microscopy will be sent to Histopathology Laboratory, Hospital Sultanah Bahiyah, Alor Setar upon request.

2.0 GENERAL REQUIREMENT OF TEST REQUEST:

- 2.1 For Histopathology/Cytology examination requires PER PAT 301 form (2 copies).
- 2.2 This form must be completed with these details:
 - i. Name , Gender, Race , Identification number (IC) and location.
 - ii. Relevant clinical information and diagnosis, specimens (type & site), type of procedures.
 - iii. Form must be stamped and signed by the Doctor. Contact number of Medical Officer or Specialist in-charged is required.
 - iv. Urgent request must be stated clearly on the top of the form as “URGENT”.

3.0 TURN AROUND TIME (TAT) AND REPORT

- 3.1 Urgent biopsy for HPE : 3 days
- 3.2 Routine case HPE : 14 days
- 3.3 Urgent Cytology test : 3 days
- 3.4 Routine Cytology test : 5 days
- 3.5 Urgent Pap Smear : 3 days
- 3.6 Routine Pap Smear : 14 days

All the histopathology and cytology report that is received from the referring center will be uploaded into the LIS.

4.0 HISTOPATHOLOGY SPECIMEN COLLECTION & CONTAINER:

- 4.1 All specimens for histopathological examination should be included in Formalin preservative (10% buffered formalin fixative) as soon as taken from the patient.
- 4.2 Ensure that the volume of formalin is sufficient (approximately 10-20 times the volume of tissue to be preserved)
- 4.3 The specimen container to be used must be appropriate to the size of the specimen and volume of the formalin. It must be labeled neatly and correctly, and tally with the request form.
- 4.4 Multiple specimens from the same patient can be sent using a same form. Please ensure type and site of specimen are labeled and stated correctly on the form and container.

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PATHOLOGY & TRANSFUSION HANDBOOK

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